



UNITED NATIONS ENVIRONMENT PROGRAMME
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT



DESERTIFICATION CONTROL PROGRAMME ACTIVITY CENTRE

**LISTENING TO THE PEOPLE:
SOCIAL ASPECTS OF DRYLAND MANAGEMENT**

Daniel Stiles (Editor)

Proceedings of an International Workshop Held in Nairobi

14 - 18 December 1993



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TABLE OF CONTENTS

	Page
Preface	4
Opening Address	5
- Elizabeth Dowdeswell	
Introduction to the Workshop	9
- Franklin Cardy	
Social Dimensions of Desertification: A review of key issues	16
- Solon Barraclough	
Supporting Local Natural Resource Management Institutions	110
- Yvette Evers	
Listening to the People - Reflections on the Use of Indigenous Knowledge in Strategies to Curb Environmental Degradation	127
- Sabine Häusler	
Native Experience in Panama about the Traditional Use and Protection of Forests and Other Natural Resources	144
- Enrique Inatoy	

Departure Points: Researchers, Rural Communities and the Transfer of Technology	151
- Ron Ayling	
Helping Rajasthan's Camel Pastoralists Survive and what NGOs could do about it: the view from the bottom	165
- Ilse Köhler-Rollefson	
Sustainable Growth in Machakos, Kenya	184
- Michael Mortimore, Mary Tiffen and Francis Gichuki	
Land Use Management: Hopes and Constraints	199
- Armelle Faure	
Using Indigenous Knowledge for Sustainable Dryland Management: A Global Perspective	211
- D. Michael Warren and B. Rajasekaran	
The Active Method of Participatory Research and Planning as a Tool for Management of Natural Resources	237
- Bara Guèye	
Natural Resource Management in Pastoral Africa	254
- Roy Behnke	

Environmental Degradation and Public Policy in Latin America	266
- Jorge Uquillas	
Indigenous Peoples, Resource Management and Traditional Tenure Systems in Sustainable Development in African Dryland Environments	286
- Robert Hitchcock	
Gender and Participation in the Conception, Planning and Implementation of Environment and Development Projects in the Drylands	319
- Michael Horowitz and Farouz Jowkar	
Paradigms Change, But Not as Quickly as Rural Middle Eastern Women	365
- Farouz Jowkar	
The Impact of Social and Economic Change on Pastoral Women in East and West Africa	388
- Judy Pointing	
A View From Within - Maasai Women Looking at Themselves	407
- Birget Duden	
Proceedings Summary	422
Programme	454
List of Participants	459
Acronyms	471

PREFACE

Why should governments and international assistance agencies 'listen to the people'? If the people knew what they were doing they would not be in the mess they are in, right? They are the ones chopping down the trees for fuel, they are the culprits guilty of mismanaging the fragile land, causing soil erosion, and they are the profligate 'live-for-today' people who are reproducing faster than food production or economic growth. Why listen to them?

The reason why we all should listen is based on the premise that people are being forced or led by circumstance to do things they themselves usually recognize are not in their own best long term interests. Because they do not feel in control of their future, however, they maximise a certain short term gain instead of investing for an uncertain long term one. If the enabling environment, as it has come to be known, can be created, local people usually are well placed to know how to transform their actions in terms of resource utilisation and management to achieve optimal long term sustainability. They have the knowledge and, more important, the incentive to do so.

For a variety of reasons creating this enabling environment has proved extremely difficult. The papers presented at this workshop and the ensuing discussions have led to the formulation of recommendations that need to be implemented in order to achieve good land use management and sustainable development. This publication is intended as a step in the long road leading to that crucial goal.

Daniel Stiles

Editor

OPENING ADDRESS¹**Elizabeth Dowdeswell****Executive Director****United Nations Environment Programme**

Let me tell you how pleased I am to welcome you all to Nairobi to this important workshop on "Listening to the people: Social Aspects of Dryland Management." I wish you an intellectually stimulating and productive sojourn at Gigiri during the next four days as you intensively debate and deliberate on the subject.

Seminars, workshops and even international conferences have a tendency to get quagmired in complicated debates and discussions - which have more to do with rhetoric and posturing than with discovering new meanings and arriving at creative solutions to problems. I am sure this workshop will avoid these pitfalls. The seriousness of the problem that you will be discussing, and the interdisciplinary expertise which you will bring to bear on the subject will ensure that.

Our high expectations are focussed on you. We look to you to provide us with creative and pragmatic solutions for implementing the relevant recommendations of chapter 12 of Agenda 21 on "Desertification". Your suggestions will also form a valuable input for the Commission on Sustainable Development in its deliberations in 1995, when it devotes special attention to desertification. Your recommendations will also be of great relevance to the Inter-governmental Negotiating Committee for a Convention on Desertification. Your suggestions will also help us, in UNEP, to make our desertification programme more

effective in its people oriented approach.

The phrase "listening to the people" is an important aspect of the new paradigm of sustainable development in the post-UNCED period. It imbues the concept of development with a meaning which goes far beyond the conventional one. Listening to the people is about building development around the priorities, needs and objectives of the people it seeks to benefit. It is about empowering people to gain control over their lives through active participation in their own development. It is about recognizing the value of indigenous knowledge in sustainable development. It is about the centrality of people in development projects rather than technology.

People can no longer be considered as abstract entities, as mere "target groups" in the development process. Yet it is common for the implementing agencies to view people as "problems" and regard themselves as embodying the "solutions". Clearly, such paternalistic or technocratic attitudes have not worked in the past and are doomed to failure in the future.

Most of the papers which are slated to be discussed in this workshop recognize this. In fact the failure of various dryland management schemes has been attributed, in these papers, to the adoption of a top-down approach to development, ignorance of local systems, short time horizons and use of complicated, difficult to maintain systems. It has also been realized that success obtained in the laboratory may have little relevance at the ground level. It has even been found difficult to replicate success obtained in one region in another region. And yet there are success stories we can build on.

How do we replicate these success stories? What enabling mechanisms can be designed to increase people's participation in the process of managing dryland schemes? How can socioeconomic information be integrated into our dryland management programmes to provide effective assistance at the ground level? How to maintain an effective two-way information link between the national governments, international agencies and local communities? How to ensure that the benefits of sustainable development of drylands reaches the marginalised, the politically invisible masses?

These are some of the issues which have to be addressed by this workshop. The recommendations that we look forward to are not on what 'should' and 'ought' to be done but on 'how' best these actions for sustainable development can be implemented. What we require, in essence, are practical suggestions on the manner in which changes can be brought about which are both incremental and self-enforcing: for the people to be enabled to actively participate in their own development and for the implementing agencies to shed their negative attitude about the people they seek to serve and benefit.

Another issue in drylands management which will be discussed here is the neglect of women and the factors that render them vulnerable. The brunt of the consequences of environmental degradation are borne by women. Environmental degradation contributes significantly to their work load while simultaneously reducing their capacity to meet their provisioning functions for their families. The "invisible" nature of women's contributions needs to be recognized and their perceptions and needs should also be considered while making recommendations on the issues I have just mentioned.

All of us are agreed that "Desertification" is a complex phenomena. There has even

been dispute about its precise definition. Yet the effects of desertification are manifested socially. The hardships suffered by the millions who stay behind in a land gradually losing all its productivity and the millions of those who decide to leave their impoverished surroundings to an even more miserable existence in an urban setting - are the social manifestations of this malaise.

We have much to gain from your perspectives on the subject: This workshop offers us a new opportunity to step out boldly from the cocoons of our disciplines to confront the social aspects of desertification in all their complexity, and furnish cogent and creative solutions which can help governments in their negotiations of the desertification convention and in their deliberations on the practical applications of the concept of sustainable development.

Notes

1. This is the introductory address made to the workshop participants on the morning of the opening.

LISTENING TO THE PEOPLE
SOCIAL ASPECTS OF LAND DEGRADATION IN DRY LANDS
INTRODUCTION TO THE WORKSHOP

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Introduction

Land degradation is often a slow, wasting process - all too clear to individual farmers as yields decline, yet visible to others only when wind and water begin to erode the soil. The causes of this degradation, that can be modified, are mostly human; but they are exacerbated, even dominated, by climatic fluctuations; and it is important to note, wet periods can have as significant an effect as periods of drought. Let us be clear, we are talking about degradation of the Earth's productive drylands, where the people are, and not about the essentially unproductive hyper-arid deserts.

Although there has been much debate among technical people about the extent of desertification, all agree that land degradation does occur as the result of human activities and of natural causes in the arid, semi-arid and sub-humid regions of the world.

At last year's United Nations Conference on Environment and Development (UNCED), the 'Earth Summit', held in Rio de Janeiro, it was decided that: "Desertification is land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities". It now seems likely that this negotiated definition will become widely accepted.

By definition, therefore, desertification occurs and is a substantial risk in over 100

countries of the world covering one third of the land surface of the globe. As many as 900 million people in these 100 countries are at risk from desertification.

Desertification is now on the global political agenda. The negotiation of an international convention on desertification began here in Nairobi in May 1993 and is due to be completed in Paris in June 1994.

Land degradation in drylands leads to economic instability and political unrest in affected areas; and it puts pressures on economies and societies outside affected areas. Management of the drylands is in turn affected by economic policies in other areas. The GATT round now hopefully being completed will have impacts on the management of the productive drylands.

Billions of dollars are spent on treating the consequences of land degradation: on famine relief, on refugee support and on international 'humanitarian' military intervention. Less than a billion dollars per year has been spent on treating the causes of the problem.

Desertification has global consequences. As land degrades, productivity collapses, plants die, biodiversity is lost, global climate may change and waterways clog up with eroded soil, contributing to the sedimentation of coastal zones.

Because of the global impacts of desertification, its social, economic and physical scale, and the resources needed to combat the problem, progress will be made only if there is a concerted global effort.

The front-line troops in this battle desperately need help, because they are generally impoverished and illiterate; they are frequently female and often overworked peasant farmers and pastoralists, with little or no security of land or resource tenure. The challenge, and the opportunity, for the convention on desertification, is to provide tangible support to these people, in appropriate ways, so that their land management becomes sustainable, not destructive, and can survive prolonged periods of drought.

In the 16 years since the United Nations Conference on Desertification, numerous

action plans have been prepared and projects carried out. Community-based, local-level action plans have generally been most effective. But the problems persist, and the affected population grows.

To turn from winning battles but losing the war, to winning the war itself, interventions must build more on community-based action. International and national agencies must make fundamental changes in their approaches to project design, empowering the poorest, and making on-going programmes that are both local in scope and sustainable.

Action which attempts to combat desertification but ignores people's real needs will inevitably fail. The convention that is being prepared is unique in that it has to be global in scope; and yet the focus of its actions will be at the level of a farmer's field or the range of a herd of cattle. The issue for this workshop is to describe how the social dimensions of desertification can be recognised and taken into account in the design and execution of all interventions; bearing in mind that these are supposed to assist the farmers, the mothers and children and the pastoralists who are at the forefront of the battle against desertification.

There is much experience to go on, especially of well-intentioned international and national interventions which have been less than successful. At the root of many of these failures has been the lack of understanding by proponents, of the importance and complexity of social, psychological and cultural factors to be considered in supporting change. There is now a greater understanding of the importance of these factors but they have to be better documented and then they must become firmly institutionalised so that they become as important a factor in programme design as the technical and economic factors. We also have to develop indicators with which we can monitor progress in a social and cultural sense as easily as we can monitor economic progress.

There is also good news to build on. There is experience now of successful interventions and there is growing understanding of sustainable production systems, past and present. There are examples of successful approaches that have worked, involving local participation; appropriate technology transfer; the use of local institutions and decision-making mechanisms; the strengthening of management methods based on indigenous knowledge systems; the creation of more equitable relationships between men and women,

or different social classes, which results in better natural resource management; the securing of land tenure and access to resources, and so on. These usually small scale successes need to be applied in many more situations and at larger scale in order to address the global scale of the problem.

Objectives of the Workshop

The specific objectives therefore of the workshop are:

1. To identify successful socio-cultural responses and adaptations, both traditional and new, that result in sustainable management of natural resources in drylands, especially at the community level;
2. To propose socio-cultural approaches and mechanisms that governments and development organisations need to adopt in order to make optimal use of indigenous knowledge systems in land use management;
3. To recommend ways to stimulate development organisations to effectively integrate socio-economic information into programme and project planning so as to provide effective assistance at ground level; and
4. To recommend ways in which lines of communication can be established between local communities, researchers, national governments and international development organisations to promote information flow from the bottom to the top.

Issues

Chapter 12 of Agenda 21 identifies several issues that must be dealt with in the social sphere, involving actions to promote good land use management and sustainable development. These have been synthesized into 14 major issues or actions that need to be borne in mind.

The first three issues involve setting up a monitoring and evaluation system for

measuring progress in anti-desertification programmes, and feeding information back to local communities through education and information dissemination. The monitoring programmes need to be carried out at the local, sub-national and national levels.

The fourth issue is the protection and sustainable use of undegraded primary forest or grazing lands that are occupied by indigenous people. ('Indigenous people' refers to traditional groups that have a long-term attachment to their current territories, and who have been occupying those territories longer than anyone else.)

Issues 5-11 deal with local involvement in land-use policy, research and transfer of technology, training, implementation of projects and extension services. Taken together, they recommend that the process of development be put in the hands of the eventual beneficiaries.

Issues 12 and 13 address some of the most crucial issues of all: land ownership, access to local resources and traditional management practices. Without coming to grips with these issues, it will be impossible to achieve good land management and sustainable development.

The 14th issue, and a primary objective of this workshop, is to recommend how to establish mechanisms for the genuine involvement of landowners in the identification and planning of actions in a true partnership with government and international agencies. Will the methods developed by small NGOs for communication and local participation work for others?

A fifteenth issue from Chapter 4 of Agenda 21 emphasises that the major cause of continued deterioration of the global environment is the unsustainable pattern of consumption and production.

Conclusions

The purpose in asking you all to come together here at this time is to focus attention on the numerous social issues involved in combatting desertification. We hope to learn from you and your papers and presentations as much as we can about your particular perspectives on

this subject. Then, most important of all, we shall ask you to sit together in groups to pool your experience and wisdom so as to make some solid and practical recommendations for addressing these issues from a social and cultural perspective.

Your recommendations will be passed to those negotiating the Convention and made available to all those working on the drylands of the world. A final consolidation of the proceedings will be prepared when the papers have been received in final form and a report published in the *Desertification Control Bulletin*.

You are being charged with proposing recommendations for concrete action that can be taken by the various concerned parties to address the issues discussed above. It is time to move beyond rhetoric and generalized recommendations of what "should" be done. We know what should be done at the technical level. Billions of dollars have been spent on agricultural research in Africa alone over the past decade. But very little has been spent on learning to understand the social and cultural factors involved in maintaining or achieving sustainability. The purpose of this workshop is to produce clear guidelines on the social and cultural considerations that must be taken into account and to show how these can be incorporated in the work of development programmes.

Let me conclude then by presenting you with the underlying questions that we believe most need to be answered at this time:

1. WHAT ARE THE SOCIAL AND CULTURAL CONSIDERATIONS THAT MUST BE TAKEN INTO ACCOUNT IN DESIGNING AND EXECUTING PROGRAMMES OF ACTION?
2. HOW CAN THESE BE INCORPORATED IN THE WORK OF DEVELOPMENT PROGRAMMES AT INTERNATIONAL, NATIONAL, REGIONAL AND LOCAL OR VILLAGE LEVEL?
3. WHAT ADDITIONAL FACTORS HAVE TO BE INCORPORATED TO ENSURE SUCCESSFUL AND SUSTAINABLE DEVELOPMENT?

4. WHAT ADDITIONAL STEPS HAVE TO BE TAKEN TO ENSURE SUCCESSFUL AND SUSTAINABLE DEVELOPMENT?

5. HOW CAN THESE MATTERS BE ADDRESSED IN THE CONVENTION THAT IS BEING PREPARED?

Some of you may feel that some of these questions are outside your normal field of expertise or experience. Fear not. We are sure that with your exceptional range of background and experience, your answers to these questions will help make a substantial contribution to improving the circumstances of the people caught up in the battle against desertification.

SOCIAL DIMENSIONS OF DESERTIFICATION
A REVIEW OF KEY ISSUES EMERGING FROM THE LITERATURE

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Introduction

In early 1993, the United Nations Environment Programme's (UNEP) Desertification Control Programme Activity Centre (DC/PAC) requested the United Nations Research Institute for Social Development (UNRISD) to co-operate in focusing more attention on the social aspects of desertification control. UNEP asked UNRISD to prepare an annotated bibliography based on the literature dealing with social dimensions of desertification. This would be followed by a paper summarizing the principal issues and conclusions emerging from the literature review.

In its initial request, UNEP raised three sets of questions that it hoped would be useful in helping to focus the literature search. These were:

(1) The key land manager in drylands is often a woman (or man) faced with growing food for her/his family. What does she think she needs, to do it in a more sustainable fashion so as to avoid degrading the land? What assistance (support) would enable her/him to do better?

(2) What are the social impacts of drought (specifics please) and desertification/land degradation? (Data are required, not just generalities).

(3) What facts have been collected on "environmental refugees"? When does a

pastoralist become a migrant become a refugee etc.? What proportion of the costs of remedial measures (food aid, humanitarian military intervention, etc) could be attributed to desertification or unsustainable environment management or anything similar?

Subsequently, in a later communication commenting on the Preliminary Annotated Bibliography, DC/PAC suggested a few additional questions that it hoped the bibliography and review paper would be able to mention. These included controversies about the extent that desertification may arise from purely natural and not socio-economic factors; the growing body of literature about indigenous knowledge systems and their application to efforts at more sustainable development; and the institutions required to facilitate information flows from the grassroots to governments and donor agencies.

UNRISD sought the co-operation of the International Institute for Environment and Development (IIED) Drylands Programme in this project. Much of the relevant literature was more readily accessible in the United Kingdom than in Geneva and IIED's Drylands Programme already had an extensive bibliography. Yvette Evers of IIED prepared the Preliminary Annotated Bibliography in consultation with UNRISD.

UNRISD, for its part, viewed its responsibilities as being primarily to build on its experience in analysing social development issues from an interdisciplinary broad political economy approach in order to bring them to bear on UNEP's concerns. The data, analyses and contacts made in its ongoing Programme on the Environment, Sustainable Development and Social Change would be particularly helpful.

Background: The 1992 United Nations Conference on Environment and Development (UNCED) included desertification among the major global environmental issues addressed in its programme of action (*Agenda 21*). Although drought and land degradation had been a concern of populations in dry regions since the dawn of history, desertification only became an international issue in the 1970s. This was largely due to a prolonged drought in Sahel region of Africa in the 1960s and early 1970s followed by devastating famines in which hundreds of thousands of people and millions of livestock perished. The Sahel famine coincided with the so-called world food crisis of 1972-1973 when grain prices in world markets rose steeply while international grain reserves available to meet market demands were largely depleted.

Both the Sahel famine and "the world food crisis" were widely attributed at the time to droughts aggravated by land degradation and population growth. As will be seen later, these perceptions were at best partial and in many ways they were misleading. They did, however, serve to put problems of land degradation in dryland regions (desertification) high on the agenda of several international agencies.

The United Nations World Food Conference was hosted by FAO in Rome in 1974. It resulted in the creation of the World Food Council (WFC) and the International Fund for Agricultural Development (IFAD). The latter was charged with helping rural poor in developing countries to improve their productivities and incomes, principally by extending loans for rural development projects with these objectives. As a considerable portion of the rural poor were to be found in marginal dryland regions, desertification became one of IFAD's concerns. UNESCO had launched its Man and the Biosphere (MAB) Programme in 1971; this focused on social and environmental interactions, with special emphasis on dry

regions. UNEP, which had only been created following the Stockholm Conference on Human Environment in 1972, prepared the United Nations Conference on Desertification (UNCOD) held in Nairobi, Kenya in 1977. This conference addressed ecological, technological, social and policy related dimensions of desertification. It issued a Plan of Action to Combat Desertification (PACD) that was later approved by the United Nations General Assembly. Various other international agencies, intergovernmental organizations, as well as many national governments and NGOs strengthened or commenced programmes designed to deal with land degradation and its social impacts.

These multiple initiatives in answer to international concern about desertification had not generated any firm consensus in either the scientific community or in political circles about its scale, causes or alleged social and environmental impacts. There was also little consensus on what should be done about it. In fact, many of the widely held assumptions of the 1977 UNCOD conference were being increasingly questioned (Rhodes, 1991). Most of these assumptions were reiterated by UNCED in 1992.

Objectives and content: The purpose of this paper is to review some of the principal social issues underlying differing perceptions of desertification, its causes, impacts and control. It is based on a very partial review of the abundant literature generated during the last few decades. The paper is divided into three parts.

I. **Desertification Issues: The View from Above**

Since desertification problems were placed on the international organizations' agendas in the early 1970s, several issues related to its social dimensions have been the focus of considerable debate and research. These include the definition of desertification, its extent

and the numbers of people affected, its causes and its consequences.

The concept of desertification

One reason for the lack of consensus about desertification is the ambiguity of the concept. The term is much more useful for mobilizing political support to combat what are imagined to be desert sands marching over once fertile crop lands and productive pastures than for analysing the causes, effects and proposed remedial actions to deal with the multiple processes generating land degradation. These processes may often be interrelated and mutually reinforcing but they are always to some extent specific for particular sites and times.

UNEP has defined desertification as "a complex process of land degradation in arid, semi-arid and sub-humid areas resulting mainly from adverse human impact" (UNEP, 1992). UNCED broadened this definition to "land degradation in arid, semi-arid and sub-humid areas resulting from various factors, including climatic variations and human activities" (UNCED, 1992). Some authorities claim to have found over 100 definitions of desertification (Rhodes, 1991; Barrow, 1991).

Differing definitions of what is supposed to be an operational concept stem from divergent values, experiences, interests and objectives. Each definition of a process such as soil erosion carries with it differing ideological nuances (Blaikie, 1985). Different definitions of desertification also frequently imply divergent political agendas. For example, UNCED's broadening of UNEP's definition of desertification to give more emphasis to climatic change suggests the possibility of developing country governments seeking an additional rationale for requesting rich countries to bear more of the costs of its negative impacts and of its

control. Of course, this would also depend upon the extent to which climatic change could be linked to greenhouse gas emissions that for the most part originate in rich industrial countries (Toulmin, 1993).

Most definitions of desertification agree that it implies land degradation in dry regions. Dry regions can, at least theoretically, be rather precisely delimited by relating potential evapotranspiration to amounts and patterns of rainfall (UNEP, 1992; Barrow, 1991). The practical difficulties of doing this accurately for a given place and time period are nonetheless extremely formidable.

Land degradation is an elusive concept even at theoretical levels. It implies a lessened capacity of the land to produce. Net degradation is the difference between degradation from both natural processes and human interventions, on the one hand, and restorative natural and human processes, on the other (Blaikie and Brookfield, 1987).

Production and productivity, however, are socially defined.¹ Land degradation is a social concept, as is desertification. Hunter and gatherer societies will have different perceptions of land degradation than those of peasant agriculturalists. Members of both peasant and hunter-gatherer societies will perceive degradation processes differently from commercial farmers and other land managers in industrial societies. Within the same society, perceptions may vary greatly according to the observers' experience, class position, social status, gender and many other factors. Definitions and measurements of land degradation are necessarily to a large extent arbitrary.

The issue becomes even more complex when different scales of geographic areas and

of time are considered. Eroded soil from a farmer's field may be deposited by wind or water on other fields that may benefit someone else. Net degradation from erosion tends to decrease as the size of the area being analysed increases (Blaikie, 1985). On the other hand, losses in productive capacity due to reduced biodiversity or degraded vegetation will likely be less serious when restricted to limited areas than when they affect extensive regions. Moreover, some lands that are degraded by drought and by inappropriate human activities may bounce back to their previous productive potential rather quickly when these factors are eliminated. In other cases, however, recovery may require prohibitively costly investments or recuperation periods of decades and possibly millennia. These considerations lead several analysts to reject the term of desertification as an analytical category and to introduce resilience - the ability of the ecosystem to return to its former state following disturbance - into their concepts of land degradation (Nelson, 1990; Horowitz, 1990; Hammer, 1993; Toulmin, 1993).

In summary, it is impossible to find a definition of desertification that permits a consensus to emerge on how it should be measured, compared and monitored across differing ecological and social systems and through various periods of time. The identification and measurement of land degradation is partly an ideological and political issue. Nonetheless, some concept of desertification has to be adopted and made operational in order to discuss its social dimensions. This discussion attempts to follow the UNCED definition cited above.

The extent of desertification

Accepting UNCED's definition of desertification, how extensive and serious is land degradation in dryland areas and what are the trends? The review of the literature suggests considerable differences in opinion about answers to these questions. These disagreements

are in part a corollary of the conceptual issues discussed above. They are also in part a result of practical measurement and monitoring deficiencies. In some cases, differing estimates may even stem from careless arithmetic.

Areas affected: Estimates by Dregne and by Mabbutt in the early 1980s suggested that over 30 million square kilometres suffered from at least moderate desertification (Dregne, 1976; Grainger, 1990). This amounted to about one fourth of the earth's land area and over two thirds its dryland areas, excluding hyper-arid deserts. Most of these degraded drylands were in Africa and Asia and were rangelands. The proportion of drylands at risk that were already suffering at least moderate desertification were believed to range from about 70 or 80 per cent in Africa, Asia and South America, to less than half in North America and Australia. Desertification was estimated to be increasing at about 200,000 square kilometres annually (Grainger, 1990; Barrow, 1991).

There are many problems with these estimates when it comes to assessing the social dimensions of desertification. Only about 30 per cent of the land area believed to be degraded was attributable to soil degradation (UNEP, 1991 and 1992; Toulmin, 1993). The remaining 70 per cent was attributed to lands where degradation in vegetation was not accompanied by soil degradation.

Degradation of vegetative cover implies replacement of "climax" vegetation by other less desirable plant associations (Grainger, 1990). Debates about the meaning and significance of climax vegetation have continued among ecologists ever since the concept was introduced. Did bison and their Indian hunters degrade great plains' vegetation in North America? If so, what was the climax cover? How can one determine when "natural"

vegetation has been replaced by "inferior" plant associations with lower productive potential, for example? Was it always land degradation to replace woodlands in dryland areas with crops and pastures? In many circumstances clearing forests to make way for crops or other uses may represent the best economic choice for society. Moreover, agricultural use may be potentially sustainable in many formerly wooded dryland areas given appropriate management practices. Are native shrubs always more productive than annual grasses that may be more useful for pasture? The conceptual and practical difficulties of estimating degradation of vegetative cover seem to be even more formidable than estimating degrees of soil degradation (Toulmin, 1993; Horowitz, 1990).

Inclusion of areas where vegetation but not soils are believed to have been degraded increases the areas of drylands estimated to be affected by desertification from about one fifth of the total area to over two thirds of the total. It also raises many additional issues in analysing the social dimensions of desertification. These global estimates are extremely vulnerable to criticism as they confound processes that are clearly land degrading with others about which there is a great deal of uncertainty concerning their long-term impacts on land productivity. Including degraded vegetative cover on non-degraded soils in estimates of areas affected by desertification may be counterproductive for mobilizing donor support for programmes to improve natural resource management in dryland areas (Toulmin, 1993).

Many of these ambiguities are evident in UNEP's World Atlas of Desertification (UNEP, 1992). The atlas was prepared under the direction of a group of world eminent experts. Its maps and tables showing the extent of drylands by region and the proportions that have suffered various degrees of soil degradation appear to be the most authoritative to date. But the preface discussing the extent of desertification in various regions cites

estimates of total dryland areas that have been degraded including those where only vegetation was affected. The preface states: "In terms of severity of [dryland] degradation, however, North America and Africa are by far the worst off with 76 and 73 per cent of their drylands degraded". This could only be plausible if most changes in dryland vegetation in North America during the last few centuries were considered to be degrading. This is a debatable question as only about one tenth of drylands soils in the region were estimated in the Atlas (table 2) to have been degraded as compared with nearly twice as high a proportion in Africa. UNCED's Agenda 21 estimates that worldwide some 3.6 billion hectares of drylands have been degraded. The atlas tables suggest, however, that soils have been degraded (at least slightly) on only about 1.04 billion hectares of drylands.

Number of people affected: The problems of estimating the populations affected by desertification are even more intractable than those of assessing extents and rates of land degradation. In a global economy, practically everyone is affected directly or indirectly by any significant change in global agricultural markets whether induced by desertification or something else. If desertification is affecting agricultural output, costs, migration rates and the capacity to resist droughts significantly on a worldwide scale, then all the world's people may eventually be affected in one way or another.

Estimates made by Mabbutt and also by Dregne in the early 1980s suggested that nearly 300 million rural people and another 200 million urban dwellers were directly affected by desertification. These earlier data were evidently based on estimates (often highly notional) of the number of people residing in dryland regions suffering from land degradation (whose areas were extremely problematic). UNCED's 1992 figure of 900 million people in dryland areas at risk from desertification was derived by combining FAO's estimates of the

agricultural populations in sub-national administrative districts with UNEP's maps of dryland regions in danger of degradation, according to information provided by a UNEP official.

Even assuming away problems of estimating the numbers of people residing in areas at risk from desertification, the question remains of how they are affected. Most may experience negative impacts on their livelihoods, as the literature usually assumes, but the effects are undoubtedly different for divergent groups. In the past, some individuals and social groups probably benefited, in several respects at least, as there are usually winners and losers in any process of change in socially differentiated societies. Until now at least, some social groups have occasionally benefited from desertification at the expense of others in terms of increased political power, wealth and income. For example, large landlords and speculators were able to appropriate the lands of drought stricken peasants in Brazil's north-east for virtually nothing, while the former had to offer their labour to local or other employers at starvation wages (CIDA, 1966b). Much of the literature reviewed virtually ignored this contradictory reality at global and regional levels, although there were exceptions (Blaikie, 1985; Blaikie and Brookfield, 1987). Several local level case studies, however, attempt to consider who gains and who loses, as will be seen later.

Conclusions: The extent of land degradation in dryland regions is very great, and is spreading. Lumping together soil degradation of various kinds with areas suffering only vegetative degradation under the blanket term of "desertification" is confusing. It is unhelpful for promoting a better understanding of the severity of the problem or of its causes, impacts and possible remedies. This is especially the case as the alleged negative effects of many changes in vegetative cover considered to be degrading by some analysts are extremely controversial.

Similarly, the estimate of 900 million people at risk from desertification is not particularly useful for appreciating the social implications of dryland degradation. These represent only the agricultural (including pastoral) populations residing in dryland areas where soils and vegetation are believed to be in danger of becoming increasingly unproductive. It does not include urban and other non-agricultural residents in these areas who also may be very directly affected by land and water degradation, nor does it include populations outside these dryland regions who may be seriously affected directly or indirectly by externalities such as water scarcity, sediments, floods, decreasing biodiversity, higher prices, migrations, social conflicts and the like. The estimate does not take into account the fact that different social groups are likely to be affected in divergent ways, both negatively and, by at least some criteria, positively.

Causes of desertification

For analysts who use a concept of desertification attributing it primarily to human activities, its causes are mainly social by definition. There is usually discussion of an assortment of direct and indirect social causes, but natural processes such as long-term geological, biological and climatic evolutions or fluctuations that may be largely independent of human activities are usually relegated to the background context. On the other hand, analyses of desertification that start from a definition emphasizing both natural causes, such as most major droughts in the past, and human activities in degrading drylands deal more explicitly with interactions between natural and social systems and subsystems.

Interacting natural and anthropogenic causes: UNEP's attempt to ascribe the main direct causes of all soil degradation in each region to different human activities such as deforestation, overgrazing and non-sustainable agriculture (UNEP, 1992) is easily

understandable because these processes may be directly influenced by public policies. It is misleading, however, as it ignores natural causes of soil degradation interacting with human interventions. Examples would include most past climate changes, geologic uplift accompanied by accelerated soil slippage and erosion, many insect and other plagues, volcanic eruptions covering large areas with ash while also influencing climate, some naturally caused fires and the like.

Oversimplistic approaches to the causes of land degradation have been widely criticized by several specialists (Glantz, 1987, 1988 and 1989; Spooner and Mann, 1982; Blaikie, 1985; Blaikie and Brookfield, 1987). The relationships between drought, land degradation and society, for example, differ in each situation. Enough is known, however, to be able to predict that areas subject to severe droughts and longer term climatic cycles in the past will probably continue to experience similar fluctuations in the future irrespective of human activities.

Droughts often stimulate sequences of actions and reactions leading to long-term land degradation. Droughts may also trigger local food shortages, speculation, hoarding, forced liquidation of livestock at depressed prices, social conflicts and many other disasters associated with famines. These may catastrophically affect numerous groups and strata of local populations (Frankie and Chasin, 1980).

Pastoral and peasant societies learned how to cope with the risks of drought after centuries of trial and error. These strategies allowed the group to survive although usually with considerable hardship for many of its members. Traditional coping strategies were disrupted by incorporation into expanding world markets accompanied by growing

monetarization, commercialization, colonial and post-colonial land alienation and taxes. These disruptions continued with the conflicts, policies and institutional changes associated with the creation of independent national states bent on "modernization". Droughts alone can seldom be blamed for accelerating desertification or for the hardships accompanying famines. Both desertification and famines are the outcomes of interacting social and natural systems locally, nationally and globally (Glantz, 1987).

A good case in point was the 1968-74 Sahel drought mentioned earlier. Research during the 1970s showed that social processes, institutions and public policies, within the context of pre-drought international economic and political relationships, provided much better explanations of the famine and its impacts on different social groups than did drought alone. These other factors were also largely responsible for the long-term land degradation that took place. Drought was merely an important catalyst (Frankie and Chasin, 1980).

The International Federation of Institutes for Advanced Studies (IFIAS) sponsored exhaustive research on causes of the Sahel famine as part of its study of the role of climate changes in producing the 1972-73 "world food crisis". IFIAS's project "Drought and Man - The 1972 Case Study" concluded, after a great deal of exhaustive research, that drought in various parts of the world in the late 1960s and early 1970s was only a minor factor contributing to the "world food crisis". Socio-economic and political factors such as an unstable world monetary system and changes in some agricultural policies in the United States and USSR had been far more important. The IFIAS study of the Sahel famine reached similar conclusions. Neither the famine's root causes nor its social impacts could be primarily attributed to drought or to desertification although these were contributing factors (Garcia, 1984; Garcia and Escudero, 1982; Garcia and Spitz, 1986; Independent Commission

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on International and Humanitarian Issues, 1985; Barraclough, 1991a).

The Sahelian case illustrates the complex local, national and international socio-economic and political factors underlying the frequently catastrophic impacts in underdeveloped countries of drought and land degradation. In seeking to understand the causes of desertification, however, it is instructive to look at the historical record for particular sites and regions. This is no easy task as written historical records seldom address most of the relevant questions and in any event they do not even exist for many places and seldom cover long enough periods to assess secular changes in climate. Digging up and analysing sufficient complementary archaeological, geological, paleoecological and paleoclimatical data is costly and arduous. Where it has been attempted, there are always pieces of evidence missing and many contradictory hypotheses. Nonetheless, some tenuous conclusions about the role of natural and social processes in land degradation can be drawn for a few places where such studies have been made. These support what has been said above about interacting natural and human processes.

One of the earliest agricultural-based civilizations, the Akkadian empire in Syrio-Mesopotamia that had prospered between 2600 and 2200 B.C., apparently collapsed as a result of drought-induced desertification. This society had reached hitherto unmatched development and prosperity by 2200 B.C. It embraced an area spanning more than 1,200 km from the Persian Gulf to the headwaters of the Euphrates river with over 100,000 inhabitants and numerous cities when it suddenly disappeared. The empire's fall was apparently triggered by an abrupt climate shift that left the region exceedingly dry for over 300 years. Traditional agriculture could no longer support the cities and drought-stricken migrants invading from further north soon overwhelmed them. The empire's highly

centralized administrative system of control and surplus extraction undoubtedly contributed to its vulnerability to the onset of drought. The dry spell was associated with increased volcanic activity in Anatolia, but massive warming of ocean currents disrupting local weather patterns seem to be a more likely explanation of the long dry period. In any case, the climatic change was unlikely to have been induced by human activities (Weiss et al., 1993).

Blaikie and Brookfield examined evidence from the sub-humid Mediterranean region and from humid north-western Europe. They wrote: "We do not reach any firm conclusions, indeed cannot, but are able to suggest that variability in the 'human' elements in the equation can be given some degree of precedence even though natural events outside the present normal range of experience may also have been significant." They emphasize three general conclusions. First is the importance of land management in relation to crops and the land-use systems. Second, the linkages between the ability of farmers to manage land sustainably and the conditions of the state and its economy. The latter circumscribe the possibilities of the former. For example, social transformations at the state level may facilitate more productive and sustainable land management even with increasing population pressures on resources, while in other cases such increased population pressures could spell disaster. Thirdly, they stress the importance of occasional extreme events.

"The point that emerges is not that a single disaster creates degradation, but that a succession of disasters has a particularly damaging effect when ongoing social and economic conditions are such as to expose the production system and the land to abnormal harm from such events ... This conclusion also points up the potential linkage between the study of land degradation and that of natural hazards and their impact ..." (Blaikie and Brookfield, 1987).

Numerous other studies suggest similar conclusions. For example, overgrazing can lead to land degradation in some situations, but so can undergrazing in others (Nelson, 1990; Horowitz, 1990). High population densities and intensive cropping frequently lead to land degradation. In the pre-conquest Andean region, however, growing population pressures were accompanied by careful terracing and water management with sustainable high levels of land productivity. Following the Spanish conquest, population decreased drastically. Terraces and irrigation systems were neglected while land degradation greatly increased (Treacy, 1989). There are also numerous recent examples of where decreased rural populations have been followed by severe land degradation when sustainable intensive farming systems decayed (Garcia Barrios and Garcia Barrios, 1992; Barraclough and Ghimire, forthcoming). Each case is in many respects unique and has to be analysed within its own particular context. But such analyses should not be limited to local levels. Broader ecological, socio-economic and political contexts also have to be explicitly taken into account and integrated into the analysis.

Direct and indirect causes: Much of the desertification literature reviewed makes at least an attempt to follow this dictum about taking into account broader contexts. For example, Grainger concludes his chapter on causes of desertification as follows:

"Desertification has four direct causes, overcultivation, overgrazing, deforestation and mismanagement of irrigated cropland. These do not occur by accident, but are greatly influenced by the effects of growing populations, economic development and conscious policy decisions by governments and aid agencies" (Grainger, 1990).

Grainger also mentions other factors such as cash crop expansion, land tenure,

poverty, underdevelopment and trade policies. The problem is that he makes no analysis of social systems and of how they are functioning in specific contexts. There is a listing of "direct and indirect causes" of desertification, but no integrated analysis of relationships and hierarchies among them. The probability that similar social processes and policies might lead to very different outcomes in different social contexts is hardly considered. There is little recognition that systemic changes are highly unpredictable both in their occurrence and their effects, but that they happen rather often in both natural and social subsystems.

This simplification of the issues permits the author to dedicate the last half of his book to discussing measures designed to control desertification. These, for the most part, are intended to attack its direct causes. He compares desertification to a chronic disease that demands continued medication (Grainger, 1990). Anyone reading Blaikie and Brookfield, Spooner and Mann or Glantz might justifiably question whether the medication Grainger proposes may not be similar to treating malaria or AIDS with aspirin. In fact, he recognizes this in his concluding chapter.

Conclusion: Natural and social processes both play important roles in causing desertification. They are usually inextricably intertwined, but in different mixes in each local situation. Among natural causes, drought is the most important in stimulating sequences of actions and reactions that frequently are accompanied by land degradation. In some circumstances, however, droughts may contribute to the emergence of social strategies that enhance sustainable land productivities while protecting local livelihoods (Blaikie and Brookfield, 1987).

The role of human activities in influencing the frequency, extents and severities of

droughts is too complex to be treated in any depth here. It is sufficient to note that there is clear evidence that in some cases they are crucially important in accentuating local climate variations while in others they seem to have had only a minor role. The evidence that human activities influence global climate patterns through greenhouse gas emissions and in other ways is also compelling. The uncertainties inherent in global climate modeling, however, do not permit firm predictions. There is a great deal of uncertainty concerning human influence on climates in the recent past and their possible effects in the future (Schneider, 1989; Glantz, 1984, 1987).

The social processes and structures contributing to desertification, or to its control, are infinitely varied at local levels. Facile generalizations are always plagued by multiple exceptions. The so-called "direct causes" such as overgrazing, careless cultivation, overuse of irrigation, deforestation and the like can not by themselves take one very far in understanding the social dynamics leading to land degradation as these are usually generated by much broader social processes.

Explanations of desertification assuming peasant ignorance and short-sightedness were especially in vogue with colonial administrators. These have been largely discredited by research illuminating traditional peasant farming and social systems and the processes disrupting them such as land alienation, surplus extraction and commercialization. On the other hand, explanations assuming short-term profit maximization goals by commercial farmers who can escape their costs of land abuse by shifting them to society are also incomplete. Non-sustainable land-use practices by well-off commercial operators as well as by poor peasants and herdsmen are for the most part determined by policies and institutions over which they have little or no control. Among these, national and international economic

and political relations are of paramount importance.

More effective control of desertification requires a better understanding of the processes and socio-economic relations generating it at all levels. It also requires perceptions by those wielding economic and political power locally, nationally and internationally that their own interests are at stake.

Social impacts of desertification

Mention has already been made of possible global impacts of land degradation through its influence in stimulating social tensions, migrations and market shortages of some important commodities produced in dryland regions. Also, it may contribute to climatic change, although this remains controversial. One must treat quantitative estimates of these impacts with great caution as all are based on questionable assumptions.

Costs of desertification: Estimates of several tens of billions of dollars annual loss from land degradation, for example (Barrow, 1991), seem rather meaningless. Comparing monetary costs and benefits across different social systems with divergent values presents insuperable epistemological difficulties. Land degradation implies lower land productivity by definition. Its economic and social significance is likely to be very different for largely self-provisioning peasants in Nepal or Tanzania than for commercial farmers in western Europe, Japan or the United States. In OECD countries, governments are spending a total of well over 100 billion dollars annually in agricultural subsidies largely to protect their agricultural producers from the ravages of falling prices accompanying market gluts (UNCTAD, 1991).²

One of the biggest difficulties in assessing social impacts of desertification is to separate those attributable to land degradation from those arising from other processes associated with desertification, or even those rather independent from it. Drought and longer term climate changes, land alienation and other ravages of "modernization", wars and other social conflicts, structural adjustment and related public policies, and demographic changes are only a few examples.

Desertification is frequently only one factor in explaining the social disruptions and social costs for which it is sometimes blamed. Famine in the Sahel discussed above and severe poverty with massive out-migration in Brazil's north-east mentioned below are only two examples. On the other hand, the longer-term costs to society of land degradation may be much greater than perceived even by some observers who are considered to be alarmists. This is primarily because the options for unborn generations may be seriously curtailed. How important this appears largely depends on one's vision of the world and its future. Many economists foresee infinite human capacities for social and technological adaptations and innovations (World Bank, 1992; Simon, 1981; Beckerman, 1974, 1992). Some ecologists and other scientists, however, predict catastrophe as society approaches its limits to economic and demographic growth (Erlich and Erlich, 1970 and 1992; Brown, 1973, 1979; Meadows, Meadows and Anders, 1970; Wilson, 1988). These are not issues that can be fully resolved by empirical research. The questions they pose remain in some measure metaphysical.

Costs for whom?: A more immediately practical issue about the social impacts of desertification is that of costs and benefits for whom? This was mentioned earlier in connection with the discussion of populations affected. Some groups benefit and others lose,

Although even those who gain in wealth and power may be negatively affected by a poorer environment. Within these groups, some sub-groups and individuals benefit or lose much more than others.

Subsuming the benefits and costs for different groups and individuals within some global cost-benefit calculus involves heroic assumptions that are questionable philosophically and likely in any event to be misleading as a basis for action. Scrupulous analysts of the social impacts of desertification should attempt to identify explicitly how different social groups and classes are affected before imposing their own choices of values for estimating social costs and benefits. This would allow others with different values to make their own calculations. Also, it would facilitate identification of policy interventions aimed at specific problems.

II. A Bottom-Up Approach to the Social Dynamics of Desertification

To approach desertification issues starting from the perspectives of those subsisting on lands in vulnerable dry regions is no easy matter. Some nine hundred million people gain their living directly from these lands while many more are supported by them indirectly. For the most part these people depend crucially on dryland productivity for eking out bare livelihoods, although some may be relatively well off. A few may even be large and influential producers with good access to government credits, services, protection, infrastructure, modern technology and sheltered markets. In most poor countries, peasants and pastoralists are competing among themselves as well as with powerful private and state corporate interests for the same scarce land and water resources.

In each locality different combinations of institutions regulate access to resources and

the divisions of labour and of production. Local populations are always socially stratified in a variety of occupational and status roles. Lineages, ethnic or religious identification, caste, class, age and gender as well as linkages with markets and political authorities outside the local communities all influence what social groups are most relevant to consider in a given locality when trying to understand livelihood issues and their relations with land management. Moreover, many rural societies in developing countries are undergoing violent disruptions as they become increasingly incorporated into regional, national and international markets, power structures and conflicts. Traditional social relations and livelihood systems are frequently overridden, deformed or crushed with shocking brutality. These traditional systems were often cruel and very inequitable, but all too often what replaced them was even worse for many participants and for the environment.

In opting for a bottom-up approach in attempting to understand better the processes and relationships generating land degradation and determining their social implications, complications such as those just mentioned have to be kept constantly in mind. At the same time, it is necessary to simplify in order to relate what is happening at local levels to broader national, regional and global possibilities and trends. This implies finding in-depth local-level case studies that bring out interactions. Cases should represent several different important patterns of social institutions, ecological contexts and processes of socio-economic and political change taking place in regions vulnerable to desertification. The case studies should illuminate the local-level dynamics that induce different individuals and social groups in their pursuit of livelihoods or profits to behave in the ways they do. Constructing such a typology is a major challenge.

Ideally, local-level case studies should also bring out how each group's alternatives

and incentives are constrained by existing social arrangements and what opportunities may exist for relaxing these constraints. These questions cannot be restricted to analyses of local communities. Institutions, policies, market forces and conflicts at national and international levels sharply constrain vulnerable social groups' quests for survival and improved livelihoods. As different social groups have conflicting as well as complementary interests in their access to resources, conflicts and potential conflicts have to be taken into account in analysing alternatives. Case studies of this kind imply that the problems and perceptions of the major social actors have been understood and reported.

This agenda is utopian, but it suggests what to look for in reviewing case study materials in the literature. The rest of this section attempts to follow this bottom-up approach in examining social dimensions of desertification.

Local-level perceptions and dynamics

The case studies reviewed make clear that the negative social effects associated with land degradation are felt principally by the rural poor. Better off groups and strata by definition have better access to resources, community services, markets and infrastructure. They also have more access to political power. The most vulnerable groups usually include the landless and near landless, pastoralists with lower status or smaller herds, ethnic or religious groups who while not necessarily minorities are subordinate, and especially refugees. Within these less privileged groups, the elderly, women and children are likely to be particularly vulnerable, although this is not always the case. These generalizations verge on being tautologies. Wealth and power tend to be nearly synonymous in most societies as do poverty and powerlessness.

Local social systems are highly diverse as are the farming systems accompanying them. By the late twentieth century practically all local societies have become incorporated into the world industrial-commercial system, but in varying ways and degrees. Each situation has to be studied with the participation of the various social groups involved to determine who the major actors are, what their principal concerns may be, what roles they are playing and why, as well as if there are any feasible alternatives.

This is an important conclusion. Those proposing national or international programmes to combat desertification or to alleviate its social effects should heed it seriously. The popular NGO admonition of "Think globally but act locally" always should be supplemented by its corollary of "Act globally but think locally taking the whole wide range of local conditions into account".

Who are the land managers?: The concept of local land managers has to be re-examined in concrete situations in order to be operational. It implies an economic unit such as a peasant holding, family farm, or a large ranch or plantation with a centralized management. The family heads or the managers of large units are assumed to make land-use decisions as well as those concerning farming practices, investments, self-provisioning, marketing and the like. This is a long way from reality in many contexts.

In customary farming systems in West Africa, for example, different members of the same extended family group living in the same compound make various production, consumption, investment and land-use decisions responding to traditional inheritance and other social rules. Their agricultural and pastoral activities take place in organizational contexts that have little relation to the western concept of a farm unit (Savané, 1986, 1992;

Barraclough, 1991a). The same is true for sub-units of latifundia-minifundia systems in Latin America, and surviving customary communal systems in both Latin America and Asia (Jodha, 1982; Barraclough, 1991a).

When the male heads of peasant families were persuaded by state development agents sponsored by the United Nations Andean Community Development Programme to plant trees on abandoned idle lands near Lake Titicaca, for example, the trees were ripped up by their womenfolk soon afterwards. The "abandoned" lands were part of the women's long-term brush-fallow-potato rotation (CIDA, 1966a). In Brazil's semi-arid north-east, peasants frequently have no secure tenure rights. Their land-use and cropping practices are practically dictated by absentee landlords, merchants or moneylenders (Johnson, 1973; CIDA, 1966b; Barraclough, 1991b).

The historical context: Each local situation affected by desertification has to be understood in its particular historical perspective. For example, the arid and semi-arid Algerian steppe includes 20 million hectares and supports some 6 million head of livestock, mostly sheep, raised by nomadic steppe dwellers. Before European colonization in the nineteenth century, these nomads moved their flocks throughout the steppe in accordance with the seasons and climate changes to take full advantage of its pasture while minimizing risk. They also had complementary trade and land-use relations with settled farmers in the north and oasis dwellers to the south. These inter-group relations included barter of many vital products and seasonal grazing rights for all three groups on some lands controlled by the others to make the fullest use of available scarce water, rangeland and cropland resources. This traditional pattern broke down under French colonial rule. Colonists appropriated the agricultural lands of the north for modern commercial export-oriented

agriculture. They excluded the nomads while the colonial state closed access by the nomads to remaining forest. It also imposed taxes.

Social inequalities and land degradation both increased rapidly as did pauperization of a majority of the nomads, although a few became large breeders, and the virtual extinction of their traditional culture. The war for independence led to further social disruption as did many policies of the independent state later. Government efforts to establish "green belts" and "pastoral co-operatives", while apparently well intentioned, were accompanied by further social and ecological degradation. Out-migration of nomads to the cities accelerated, where most continued in poverty. Desertification of the steppe and the negative social effects accompanying - and causing - it, cannot be understood without reference to this historical background. Efforts to rehabilitate the area and its people will inevitably fail if they are not based on a knowledge of the historical reality and do not enjoy the effective participation of the groups most affected (Bedrani, 1983).

This case is summarized briefly here because its sensitive treatment in a dynamic historical context of major socio-economic, political and ecological processes associated with desertification makes it one of the better ones encountered in the literature review.³ It shows why the social effects of desertification can not really be separated from its causes and why "ecological refugees" can seldom be neatly distinguished from refugees fleeing the ravages of war or "modernization". In one sense, a principal cause of desertification and its negative social impact during both the colonial and post-colonial periods was what is commonly called "development". This included "modernization" of commercial agriculture where profitable, urbanization and, especially after independence, industrialization. But the ways these development goals were pursued disrupted ecologically sustainable land-use systems while

excluding increasing numbers of nomads and other groups from their traditional sources of livelihood before alternative opportunities for gaining a living were available for them. Clearly, both the content of development and the strategies for achieving it will have to change profoundly in the future if it is to be sustainable either socially or ecologically in regions such as the Algerian steppe.

Social impacts of drought: Droughts affect different social groups in divergent ways. For example, a study carried out among Beja famine migrants in the eastern Sudan in 1985 can be summarized as follows:

- The semi-nomadic Beja households were very dependent upon livestock for their incomes and consequently were unwilling to sell the majority of their animals even though most of them were dying of starvation and diseases.
- The prices of livestock which were sold had fallen to approximately one quarter of the pre-drought levels by January 1985.
- At the same time, the price of the staple grain, sorghum, had risen to six times its pre-drought level.
- Households were forced to rely on self-employment to a far greater degree than had previously been the case; woodcutting, charcoal burning and mat-weaving seem to have been the most widely practised means of self-employment.
- An increase in labour migration from nearby villages also occurred.

- Access to traditional lines of credit through merchants collapsed as collateral livestock disappeared.

- Mortality and morbidity among households who had migrated to the roadside were high, mainly because of the inadequate provision of public relief to the victims.

There were marked differences in responses to drought between predominantly peasant and predominantly pastoralist producers. Pastoralists appeared to be generally unwilling to sell or slaughter livestock, whereas those households which relied mostly on crop production for food were likely to be more willing to part with their animals. Pastoralists were so dependent upon their camels for transportation that these animals were sold only when all other assets had been exhausted or were left with relatives. The propensity to sell camels appeared to be particularly low for the Beja, indicating that petty trading was an important fallback strategy for this tribe.

But this is only one case. A great many others in different contexts indicate somewhat divergent outcomes. Great care has to be taken in making generalizations. The victims are likely to attribute their plight to drought in answer to superficial questions. Deeper probing, however, usually reveals a host of other factors.

Ecological refugees: Large flows of refugees in Ethiopia, Somalia and the Sudan among many other places have been associated with droughts, falling land productivity and armed conflicts (Hjort and Salih, 1989; Hutchinson, 1991; Johnson and Anderson, 1988; Markakis, 1993; Keen, 1992; Allen, 1993; Buchanan-Smith and Petty, 1992; Davies, Buchanan-Smith and Lambert, 1991). They were also associated with the expansion of

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large-scale commercial agriculture as well as with massive land alienations for export production, "development" projects, parks and game reserves, and the like. Moreover, they were in part due to numerous government policies that discriminated against weaker social groups and favoured stronger clients of the state. Additional factors were changing international terms of trade, foreign "aid", together with political and military support for governments or their opponents. They also frequently accompanied changing demographic patterns and increasing numbers of rural people. It is quite impossible in most cases to say what weight should be given to each of these many factors causing peasants or pastoralists to become refugees.

Refugees from the 1968-74 Sahel drought were surveyed in Burkina Faso, Mali, Mauritania and Niger in 1973 by the Center for Disease Control. One of the key findings of the survey was that to cope with the loss of water and pasturage nomads attempted to carry out their traditional drought coping responses in a different way than had been customary. Entire families were migrating south to areas not usually part of the nomads' territory and to urban areas. Furthermore, the nomads were migrating for reasons other than to search for pasturage. Some groups were migrating solely to reach food distribution centres.

These unusual migrations caused many social and political problems both at the national and sub-regional level. Major Sahelian towns found that their populations suddenly grew by 50 per cent (Mopti, Mali), 42 per cent (Dakar, Senegal), and 66 per cent (Noakchott, Mauritania). Rosso in Mauritania had the largest increase in population as a result of the drought, 94 per cent. Border towns of neighbouring countries were also confronted with a sudden influx of refugees. Fifteen per cent of the rural population of

Senegal migrated to other areas. In northern Mauritania, because of high cattle mortality rates, 80 per cent of the inhabitants moved to the larger towns in the south.

This rapid influx into the larger towns and capital cities posed political and economic difficulties for the African governments which were ill-equipped to handle the situation. Relations between states were strained as affected populations moved to other countries. Migrants from Mali crossed into Benin, Burkina Faso, Niger and Nigeria. The CDC survey reported 40,000 Malian Tuaregs crossing the border into Niger. Urban unrest in 1971 and 1973 in Senegal was partly attributable to the drought and its effects. Governments sometimes manipulated the disaster to settle old political scores with opposition groups. Those of Mali and Chad are said to have used the drought to break the strength of nomadic groups by withholding aid (Somerville, 1986).

These migrants can be considered environmental refugees in the sense that drought triggered their departure. There were a great many other social processes and institutions at play, however, that would probably have caused many of them to migrate sooner or later in any event (Frankie and Chasin, 1980). The same was seen to be the case for migrants fleeing droughts in north-east Brazil discussed earlier. The concept of "environmental refugee" is extremely difficult to pin down operationally without making a large number of rather arbitrary assumptions.

In particular cases, a single factor such as drought or civil conflict appeared to be the principal catalyst in turning peasants, pastoralists or workers into refugees. More in-depth analysis usually shows that many other factors also were important contributing causes to their flight (Gray and Kevane, 1993; Fuller, 1987; Ibrahim, 1982; Buchanan-Smith and

Kelly, 1991; Allen, 1993; Keen, 1992).

This leads one to question the utility of the concept of "environmental refugees" for analytical purposes. The distinctions among causes of people being refugees is often politically useful for mobilizing government action and international assistance. These distinctions among refugees are also required for administering certain kinds of relief programmes and development projects. Aid administrators and immigration authorities may have to distinguish "political" from "economic" or "environmental" refugees, for example. These distinctions, however, are necessarily rather arbitrary except for extreme cases. They are primarily administrative conveniences and not social science analytical categories. Social scientists, however, can help administrators in specific cases to design criteria that are as realistic and fair as possible.

Local level perceptions: The principal issues associated with desertification are likely to appear rather different to the vulnerable groups most affected in rural communities than to scientists, administrators and political leaders looking at the problem from above. Moreover, not only will local-level priority concerns differ greatly from one situation to another, but they will diverge among social groups. None of the affected groups whether highly vulnerable or not, however, is likely to place land degradation per se among their most urgent preoccupations. These immediate concerns usually centre on more immediate survival and livelihood issues for members of vulnerable groups. Maintenance of status and income are usually the key issues for those who are well off.

One should note that to discover how local groups perceive the issues requires skilful in-depth participatory research. Superficial questionnaires about peoples' perceptions are

seldom very useful for revealing deep felt fears, concerns and priorities. Members of poor oppressed groups are frequently unable to articulate their grievances, or more often they may prudently refrain from doing so.

Depending on the context, members of the most vulnerable groups may view day-to-day survival from the ravages of drought or war as the number one issue. Where their situation is less catastrophic, secure access to land and a little capital such as seeds, tools and animals, or access to some kind of secure employment may take priority. Escaping excessive demands of landlords, moneylenders or tax collectors might also be high on their list, as would be providing some education and health services for their children. Land degradation may be perceived as being primarily caused by drought. Drought is often believed to be an act of God, although local residents may also link it with deforestation or shortened rotations.

The loss of traditional access to land appropriated by outsiders may be regarded as a central issue in some contexts, while in others, where it has been equally serious in its social consequences, it may like drought be perceived as being something no one can do anything about at local levels. Prices of the goods and services these groups have to purchase, and for what they have to sell, is nearly always a concern, but again markets and changing price relationships often appear to be beyond any kind of influence on their part. Large producers and merchants, on the other hand, even in poor regions of poor countries, may actively intervene to manipulate local markets and to use political connections to influence public policies.

This attempt to sketch some of the priority issues as viewed from below is necessarily

only a caricature. It would diverge in each context and among social groups. It seems likely that rather strong regional patterns would emerge based on shared cultural and historical experiences. Land tenure issues, for example, seem more likely to be perceived as crucial by the rural poor in much of Latin America and Asia than they are in Sub-Saharan Africa, although the negative impacts of land alienation for the environment and for livelihoods may be similar (Barracough, 1991a). Vulnerable groups in high-income industrial countries would have their own set of priorities. The concerns just mentioned, however, would be seen by local rural people as issues in one way or another in a great many localities experiencing land degradation. They will be explored a little further in the rest of this paper.

Grassroots responses

Faced with falling land productivity, often accompanied by increasingly restricted access to land, frequent severe droughts, unfavourable terms of trade, a less than supportive state, and sometimes with devastating armed conflicts, vulnerable social groups in dryland areas are faced with unattractive alternatives. They can try to adapt their traditional production and consumption patterns to cope with these unfavourable conditions. They can attempt to find new sources of livelihood in or near their old communities. They can migrate temporarily or permanently. And they can organize collectively to resist the forces threatening their livelihoods.

Vulnerable pastoralists and peasants frequently resort to a combination of these strategies, but principally they adapt their customary production and consumption patterns, and they migrate. If the literature reviewed is any indication, finding new sources of income locally and organized collective resistance have been successful only in special circumstances. Destitute rural people in subordinate social positions do not have much time, energy or

possibilities for taking new organized collective initiatives. If they do take them, they are likely to be ruthlessly suppressed. Here again, there are wide divergences among regions, countries and localities at any particular time.

Adapting production and consumption patterns: The most common strategy is to adjust traditional production and consumption patterns to cope with adverse circumstances. Coping may take place at the expense of the nutrition and health of vulnerable groups as well as at the sacrifice of their scanty assets. This happened on a large scale during the 1990/1991 drought in northern Sudan (Buchanan-Smith and Petty, 1992). The IIED/UNRISD/UNEP annotated bibliography reviews a wide range of studies in dryland regions of how vulnerable populations cope with adversity. It distinguishes between traditional coping strategies and more recent ones that have arisen after customary systems were weakened or disrupted by colonialism, modernization, commercialization, political conflict and the like. It also distinguished between strategies adopted by pastoralists and those by peasant farmers. Most of the studies were in Africa but there are also materials from Asia and Latin America.

Pastoralists in the Sahel, for example, had developed complex social structures and sophisticated land management systems to facilitate the minimization of risks associated with drought (Stiles, 1992; Behnke and Scoones, 1992; Speirs and Olsen, 1992). Such strategies were based on mobility, flexibility, diversification and reciprocity.

Nomadism embodies mobility. Nomads move their flocks over wide areas to take maximum advantage of seasonal and cyclical availability of pasture and water (Bonfiglioli, 1992). They also diversify their herds and maintain what many outside "experts" perceive

as an excessive number of low quality animals in relation to the offtake of meat, milk and other products. When examined in more detail, this practice makes economic sense for the nomads (Frankie and Chasin, 1980; Stiles, 1983; Behnke and Scoones, 1992; Horowitz, 1990). It enables them to make fuller use of abundant forage in good seasons and years while reducing the risk of losing nearly all their subsistence and breeding stock during poor ones. Moreover, it permits production of a wide variety of animal products required for self-provisioning (Ibrahim and Ruppert, 1991; Swift, 1973). For similar reasons, they combine animal raising with risky dryland cropping and when possible with a little crop production in riverine flood plains where it is less risky. They also develop complementary barter and grazing rights relationships with sedentary agriculturalists as was illustrated in the Algerian case earlier.

Social structures developed to facilitate this risk aversion strategy. Marriage customs, inheritance patterns, inter- and intra-family divisions of labour and property rights had many variations among different groups of pastoralists. All evolved in ways to minimize risks from drought and other adversities. They also institutionalized reciprocal obligations ensuring that risks were widely shared. Common property régimes tended to be the rule in the control of land. Access rights and obligations were usually clear and often very elaborate for different users. Access rights to certain rangeland areas and water holes were limited to particular groups and seasons, for example, while some were reserved exclusively for use during severe droughts (Frankie and Chasin, 1980). Traditional pastoralists in dry regions of Asia and Latin America developed social systems and risk aversion strategies similar in many ways to those found in Africa.

Traditional communities of settled agriculturalists commonly developed strategies in

dry regions to minimize risks from climatic variability. These were also reflected in their social structures. Common property régimes for land tended to be the rule. Where intensive agriculture evolved, however, the rights and obligations of each family and individual were clearly defined (Watts, 1987). Otherwise, maintenance of complex canal systems, terraces and soil enhancing practices, for example, would have been impossible. Settled farmers also benefited from complementary relationships with nomads, bartering their products and benefiting from seasonal depositing of manure.

Traditional pastoral and farming societies have been badly disrupted everywhere by incorporation into colonial, national and global economic and political systems. Their flexibility and other risk aversion strategies have been severely curtailed. Land alienation, together with commercialization of exchange of goods and services, including land and labour, have been accompanied by increasing social stratification and the breakdown of traditional social relations (Dahl and Hjort, 1979; Johnson and Amaah, 1974; Lashova, 1989; Little, 1985; Monod, 1975; Salih, 1985). Traditional social controls that had made these systems sustainable no longer functioned. This resulted in a large proportion of these populations becoming destitute with inadequate access to land and other resources to maintain customary livelihoods or even to sufficient food for health and physical well-being. Disruption of traditional societies has also been an important factor contributing both to rapid demographic growth and massive out-migration from many dryland regions.

One response to the changing context has been to attempt to maintain production using traditional practices to the extent possible and introducing new ones such as chemical fertilizers (if they can be obtained), more cash cropping at the expense of self-provisioning and shortening rotations. New practices requiring purchased inputs, however, usually depend

on outside support by governments or others such as agro-exporters. At the same time, consumption patterns are changed to use more purchased products and substitute scarcer local ones such as wood for fuel and construction with inferior ones such as dung and mud-bricks (Barraclough and Ghimire, forthcoming). Obviously, these responses frequently lead to accelerated land degradation and also to social deprivation. On the other hand, in some situations, responses by peasants and pastoralists have been conducive to the adoption of agricultural systems using both land and labour more intensively in ways that could be sustained for indefinite periods (Mascarenhas, 1993; Soussans, Shrestha and Uprety, 1993; Utting, 1993).

The issue is not why some peasant groups are tradition bound, lazy and ignorant while others are hard-working and innovative, as if these were somehow individual or group and community characteristics. It is rather to understand the historical processes which led to sustainable production systems in some circumstances while not in others. This requires analysis of the broader institutional and policy contexts that induce and perpetuate unsustainable responses or encourage more sustainable ones.

Finding alternative livelihoods locally: The option of members of vulnerable groups finding other productive activities locally has seldom been feasible in depressed dryland areas. Traditional crafts and trades are as negatively affected by a shrinking resource base and the inflow of commercially sold cheap manufactured products as are traditional farming and grazing systems. In times of drought, vulnerable groups may find relief locally from food hand-outs by government or international aid programmes. Some may resort to petty trade or menial services. The usual alternative chosen, however, is to migrate.

There are notable exceptions. Where national policies and institutions have been conducive to the development of new rural industries, such as they were in Israel, Taiwan and parts of China after the 1950s, these have occasionally absorbed significant numbers of poor rural people in new lines of production, in constructing complementary infrastructure and in increased economic activity generated by both (Barraclough, 1991a). New investments, however, are always limited by macro-constraints of markets, costs, finance, development strategies and political priorities. Vulnerable groups in dryland regions are usually less well placed than are many others to benefit from such initiatives.

Another exception is seen by the ingenious ways that poor peasants have responded to opportunities to improve their livelihoods offered by new lines of agricultural production and trade in a few sub-humid areas where new cash crops have a profitable outlet. Unfortunately, these are often illegal. For example, where coca, poppy or cannabis production, processing and smuggling for the international drug market has become lucrative, peasants in some sub-humid regions, and in several more humid ones, have found new sources of income near their traditional communities. The reason for citing this anomaly is merely to illustrate that the principal reason most poor peasants do not improve their incomes using their own resources is not laziness, ignorance, lack of initiative or ingenuity, but simply because they do not have a real opportunity to do so.⁴

Migration: Temporary or permanent migration is the usual response when livelihoods can no longer be maintained in the face of land degradation and other factors. In semi-arid areas of Burkina Faso and Senegal, the major sources of income for many communities are remittances from migrants to export crop producing areas in Côte d'Ivoire, to the cities or abroad, and pensions paid to local residents who once served in the French

colonial army (Savané, 1992). Numerous studies in dryland communities in Mexico, Central America, India and Nepal show a similar pattern. Remittances sent by workers in the mines of South Africa help keep alive countless communities in all of southern Africa. These are mostly in dryland regions that have badly degraded lands. This has been well documented for Botswana, although the sources of remittances are becoming increasingly domestic in this relatively prosperous sub-Saharan country (Buchanan-Smith, 1990).

Recent migrants from Central America to the United States mostly came originally from degraded dryland regions of Guatemala, El Salvador and Honduras. They often left after a stay of some years, or a generation, in these countries' cities where they got some basic formal education. The value of remittances in these Central American countries by legal and illegal migrants was estimated in 1990 to be greater than the total value of their traditional agro-exports (CEPAL, 1992).

In Brazil, a large portion of the urban workforce of the industrial south, and also of workers and colonists in Amazonia, migrated from the dry north-east. For reasons explained earlier, such migrants should not be considered to be primarily environmental refugees even though a high proportion left in drought years. Many other factors such as an exploitive land tenure system, government policies, population growth, terms of trade, the search for new opportunities in the cities and the like would have resulted in large-scale migration even without land degradation and droughts. But the latter were contributing factors.

Collective resistance: The last option of vulnerable groups is organized collective resistance in the face of threats to their livelihoods posed by land alienation for development projects, for agro-export production by large operators, and other uses of land such as for

mines or protected areas. Efforts to resist have been numerous, but seldom successful. To be effective, such resistance has to find powerful allies in the broader society. Most collective initiatives to resist land alienation are crushed by local authorities and élites without ever attracting attention nationally or internationally. A few, however, find allies and may achieve some of their objectives, at least temporarily.

A good illustration of the former was the attempt during the last two decades of Guatemalan indigenous groups to resist appropriation of their traditional lands in Altaverapaz and several other regions. They were then accused of supporting the guerrillas and many were massacred by the army. Those who escaped fled to seek survival by cutting and burning forests to plant subsistence crops on steep mountainous terrain that was very difficult for the army to penetrate (AVANCSO, 1992; and personal interviews with refugees).

The conflict between the semi-nomadic Barabaig and the Tanzanian National Agriculture and Food Corporation (NAFCO) illustrates limited success. With the technical and financial support of the Canadian development agency CIDA, NAFCO is converting over 100,000 hectares of their traditional grazing lands into wheat production. The Barabaig attempted to resist through legal and political channels. There was some limited violence and several human rights violations. The Barabaig found allies who could help them plead their case both nationally and in Canada. The wheat project is very dubious from an economic standpoint anyhow. The Tanzanian state was less authoritarian and more respectful of legal procedure and human rights than was that of Guatemala. The conflict is not yet resolved, but the Barabaig's collective resistance has probably prevented more of their lands being taken with no compensation. It may lead to changes of some policies both nationally and by CIDA. It could possibly stimulate more realistic development projects in dryland regions

both in Tanzania and elsewhere in the future (Lane, 1990 and 1993).

Collective organization by the victims is essential to resist the negative impact of "development". Otherwise political authorities and other élites, including foreign aid agencies, are likely to ignore them. If they view poor vulnerable groups as potential allies or as opponents who can cause trouble, however, their grievances may be taken more seriously. Collective resistance can be very risky for the powerless. Much depends on the nature of civil society and of the state in each situation.

Social impacts of policies and programmes to control desertification

Many colonial administrators in the 1920s and 1930s in dryland Africa became alarmed at the mounting evidence of accelerating soil erosion, deforestation and rangeland deterioration. They usually associated these processes with peasant ignorance and short-sightedness. Population increase only began to be seen as a serious problem in most of these colonies much later, although population densities often had increased alarmingly in areas reserved for traditional agriculture due primarily to alienation of good land for white settlers or its diversion from traditional self-provisioning uses to cash crop production. Colonial authorities were frequently concerned about labour shortages for colonial enterprises. In fact, populations actually had decreased in many dry regions under the early impact of social disruption accompanying colonial conquest.

Colonial conservation programmes: Colonial governments concerned with land degradation often attempted to regulate land use in accordance with conservation norms that had developed in Western Europe and the United States under very different social and ecological conditions (Beinart, 1984; Cliffe, 1988). For example, "natives" in some areas

were compelled to dedicate several days of labour each year to constructing bunds or terraces intended to control soil erosion on hillsides. They were forbidden to exploit many forest areas for fuel, construction materials or fodder that they had been using rather sustainably for centuries. Traditional use of fire in land management was often proscribed (IFAD, 1992; Blaikie and Brookfield, 1987; Gadgil and Guha, 1992). Also, large areas were withdrawn from traditional uses to become parks and game reserves.

Naturally, local people came to associate conservation policies with oppression. This was even more the case, because the conservation measures were frequently counter-productive. These conservation policies were not based on an understanding of local social systems, farming practices or ecologies. Only a few sophisticated colonial observers linked desertification to social disruption and land alienation instead of short-sighted exploitation by native pastoralists and cultivators.

This colonial syndrome in Africa merely repeated with variations what had happened earlier in India, the Americas and many other places. Governing authorities tended to blame the victims of desertification for its occurrence. New élites, and not a few older ones, were happy to do the same. Conservation programmes were designed to attack the symptoms, but not the real causes of desertification. To a great extent, desertification control programmes continue to do the same nearly a century later, although now national governments and other outsiders instead of colonial authorities are sponsoring them.

Recent programmes in poor countries: In recent years, national governments, international and bilateral agencies as well as many NGOs have launched programmes and projects in developing countries to control desertification. The literature suggests that these

have not been very effective on the whole. The desertification problem remains about the same as it was in the 1970s, if not worse (Grainger, 1988). "Successful" projects tend to have been small and of questionable replicability. Moreover, there is considerable disagreement about what constitutes success. Land conservation objectives may be achieved, often at considerable financial costs met by foreign donors. Nonetheless, this may be done at the expense of the rights and livelihoods of many traditional users of the land.

The Tanzanian government's HADO project is an example. It was funded by Swedish SIDA in the semi-arid Kondoa region of over a million hectares, one tenth of it badly eroded. The project began in 1973. In 1979, traditional pastoralists with their animals were completely removed from the degraded area to permit vegetation to recover aided by various other rehabilitation measures. One source cites it as an outstanding success. It concludes, "The rehabilitation of the vegetation in this area, already considered irretrievable in the 1930s, has been remarkable and more cultivable land has become available for farmers" (IFAD, 1992). In contrast, a Tanzanian analyst, after considerable long-term field research in the area, considered it something of a failure. He concluded "The eviction of people and cattle can restore vegetative cover in a relatively short time. But these sectoral and technocratic approaches only export the problems to other parts of the district, region and even beyond ..." He adds that the project was extremely costly in money and trained staff so that there would be little possibility of replicating it in other parts of Tanzania (Mascarenhas, 1993).

Even if there is some agreement on success and failure criteria, there are still the problems of time and contexts. A project that appears to be successful after five years may look like a disaster after 20 years, while one that looked like a flop after five years may be

regarded as a success after 20 (Nelson, 1988). The dynamics of each situation is different. In part this is due to changing national and international contexts that are practically impossible to take into account adequately. Moreover, these interact with highly variable local-level factors such as leadership, participation, technical skills and resources.

Programmes and projects intended to control desertification have usually been designed to attack its direct causes as perceived by their administrators or donors. Rangeland rehabilitation schemes such as the Tanzanian one mentioned above and many other attempts to introduce "improved" pasture and livestock management practices have been common. So too have the construction of bore holes to provide water for pastoralists' animals in dry regions. Results have often been disappointing. Evidence has been accumulating that traditional nomadic and semi-nomadic pastoralists using opportunistic grazing strategies can frequently make more economic and sustainable use of these low-yielding dry rangelands than can be done by modern ranching methods with higher quality animals and "optimum" stocking (Behnke and Scoones, 1992). Bore holes, by inducing a concentration of animals around them often lead to accelerated land degradation (Frankie and Chasin, 1980), although this is not always the case (Nelson, 1990).

The dilemma facing pastoralists is that in most places they no longer have access to much of their traditional territories. Moreover, their complementary relationships with sedentary neighbours have usually been largely severed and they themselves have become much more dependent on earning cash for market purchases while at the same time becoming more socially stratified, as was seen earlier. Not only are they unable to expand their herds more than they have in most situations, but new settlers, development projects, protected areas and the like continue to encroach their traditional territories. In some areas shortages

of fuel from brush and trees may be as severe a constraint as is scarce pasture and water.

Not surprisingly, planners and administrators, viewing these same problems from a quite different angle than the pastoralists, often conclude the only way out of the dilemma is for nomadic pastoralists to become sedentary crop producers, tree farmers and livestock growers. This implies programmes to stimulate more intensive dryland cropping, tree planting and where possible irrigation, accompanied by some animal husbandry. A great deal of effort has been made along these lines. These new farming systems often yield meagre or negative economic returns while being unsustainable ecologically and socially. The Tanzanian wheat project mentioned earlier was an example. Drought relief programmes in higher income Botswana were relatively successful in transferring some income to poor rural residents, but those aimed at increasing agricultural productivity primarily benefited well-off farmers and ranchers (Buchanan-Smith, 1990).

Examples of irrigation and settlement schemes: Irrigation and resettlement schemes have been a common government response to rural poverty and land degradation problems. In Brazil's north-east, for example, substantial public investments were made during the last few decades in construction of several large publicly controlled reservoirs, hundreds of smaller private ones, and for building irrigation systems. These were often accompanied by costly small farmer resettlement projects.

Irrigation projects absorbed nearly half the region's rural development budget during the 1970s and 1980s. Results were disappointing for several reasons. The large dams were built without taking into account the complex hydrology of the Sertão. In consequence, the new reservoirs often affected negatively other traditional water sources. Also, some irrigated

cropland soon became too salty to use. Costs were excessively high per hectare and per person benefited. The region's extremely skewed land tenure system and social structure made it inevitable that large landholders would benefit most, especially as they were the best placed to use highly subsidized irrigation water for the cash crops the government was trying to promote. Moreover, most of the smaller private reservoirs were located on large holders' properties. Much valuable crop and pasture land was inundated by the large reservoirs and many smallholders were displaced with little or no compensation. Few small farmers were actually resettled.

This costly programme made no dent in the north-east's widespread rural poverty nor did it slow land degradation or significantly increase agricultural output. It enjoyed considerable political support, however, because many influential large landowners, contractors, politicians and public officials derived substantial private benefits, even if most peasants did not (Hall, 1983; Droulers, 1989; Cavalcanti, 1989; Livingstone and Assunção, 1989).

The social impact of this ambitious irrigation programme was similar to those of countless other land development projects in Brazil. The rapid expansion of mostly unsustainable low quality cattle pasture in Amazonia at the expense of tropical forests and their traditional users is another example (Diegues, 1992; Barraclough and Ghimire, forthcoming). The principal explanation lies not so much in "faulty" project design or even corruption as in public policies. These in turn were closely linked to the country's underlying socio-economic structure and its interface with the world system.

Irrigation and other rural development projects in dryland regions with many similar

characteristics and social results have been described in the Sudan, Senegal, India and several other countries. The same is true of afforestation projects, farm forestry programmes and initiatives aimed at improving social and economic infrastructure. Only a few achieve their stated socio-economic and ecological goals. Far fewer can be regarded as being sustainable or replicable.

Popular participation: Part of the literature emphasizes that successful projects and programmes should be sensitive to the self-perceived needs and aspirations of the vulnerable groups they are supposedly intended to benefit (e.g. Stiles, 1987). There is a growing consensus that these groups should be active participants in programme and project design, administration and execution. Many studies insist on the virtues of small decentralized projects and programmes in contrast to large centralized ones. Several authors warn against top-down technocratic solutions. A few call attention to the need to take into account the socio-economic and political dimensions of desertification at all levels in designing programmes to control it. Global reviews of desertification programmes repeat again and again that there should be better co-ordination among government and international agencies, NGOs and donors to permit an effective integrated approach to desertification problems regionally, nationally and at local levels. But the literature reviewed is not very helpful in suggesting how these laudable goals can be met in diverse specific contexts.

This big gap in the literature is easily understandable. One is dealing with fundamental issues of social relations, political power, economic growth and social reproduction that have plagued societies throughout history. The social issues of desertification are, like the ecological ones, to some extent locality specific, but they are also to a very important extent national and global issues that can not be dealt with effectively

locally without supportive initiatives nationally and internationally. As was seen above, national and international markets, policies and political relations have been the principal driving forces behind the processes leading to land degradation in dry regions as well as to the increasing social polarization of their societies. All these factors contribute to widespread poverty and high levels of social conflict.

Key societal issues

This final sub-section briefly looks at wider social issues. These embody many of the principal constraints and opportunities for dealing constructively with the social causes and implications of desertification. They are issues that have always been part of the development debate. The difference is that now there is growing recognition that society at the global level may already be approaching the environmental limits of economic and demographic growth in their strictly quantitative sense. Adjustments at local levels to encourage higher productivities and more adequate living levels of vulnerable poor groups may increasingly require compensatory adjustments in the composition of production and consumption, and of technologies, of higher income groups elsewhere.

If "development" is going to become sustainable globally, economic growth will gradually have to become qualitatively and quantitatively different in practice from what it has been in the past. Perhaps dealing effectively with the social issues of desertification in several localities can help societies grope haltingly towards more sustainable development. To do this, the wider implications of local initiatives have to be explicitly taken into account.

The preceding discussion emphasized that the social issues of desertification are

always to some extent locality specific. This is why generalizations frequently tend to be rather banal. The discussion also brought out that the principal socio-economic processes and institutions stimulating land degradation do not originate locally. Remedial initiatives have to be national and international as well as local. Generalizations about societal constraints and opportunities, however, are as messy as they are about local ones.

Four clusters of national and international socio-economic and political issues appear to be especially pertinent for improving natural resource management in dryland regions. The first includes the public policies and market forces that are usually considered central for any development strategy. The second concerns institutional structures and related policies regulating land tenure, land use and social relations more generally. The third deals with farming systems, technologies and broader economic structures that constrain alternatives for vulnerable groups and sometimes offer new opportunities. The fourth set includes demographic trends and their implications. A better understanding of how vulnerable groups and other social actors with many conflicting interests perceive these issues is a key ingredient for dealing with them constructively.

Public policies and market forces: The policy context was crucial for understanding the social dimensions and dynamics of land degradation in all the cases reviewed. Colonial and national trade, price, tax and investment policies drove the introduction of cash crops, often at the expense of food production locally. These policies led to large-scale alienation of lands previously accessible to vulnerable groups and to the new social stratification accompanying commercialization of traditional economies. Social policies or their absence largely determined the access of different rural groups to "modern" health and educational services. Recently, the relatively low priority given to social services in tight budgets both

by national states and international financial institutions have led to the curtailment of the inadequate social services that may have existed in many dry regions. Investment policies frequently accelerated the marginalization of vulnerable groups, the plundering of their traditional resources and the failure to create alternative sources of livelihood. The constant wars plaguing the Sudan and many other dryland regions were the biggest single cause of famine. Such conflicts can be considered a result of policy failures both nationally and internationally.

Numerous analysts have argued that a prerequisite for any kind of really sustainable development is a popularly based development strategy. Trade, price and credit policies, social policies and investment policies should be part of a broader strategy aimed at meeting the basic needs of vulnerable groups and creating opportunities for them to improve their livelihoods both qualitatively and in terms of food security, living levels and the like (Barraclough, 1991a). Such a strategy, however, implies popular participation. There have to be local institutions and some kind of a national state or similar political entity in which these groups are strongly represented and that is accountable to them as well as to other hitherto much more powerful interests. It also implies a more democratic and accountable world order with some sort of effective system of governance capable of resolving international conflicts and guiding global economic and political processes towards more sustainable goals. The institutions and policies required to control desertification are somewhat utopian. This does not preclude partially effective local and national initiatives in their absence, but it greatly circumscribes the possibilities. This is especially the case in places where vulnerable groups are deprived of their civil and human rights or where armed conflicts are dominant.

In most places there is some limited scope for reforming policies so that they provide at least some vulnerable groups with better livelihoods as well as greater possibilities and incentives to use land more sustainably. For example, emergency aid to drought victims and refugees could more frequently be made part of longer-term efforts designed to upgrade both human and natural resources. Food aid and cheap subsidized food imports do not necessarily have to be administered and used in ways that contribute to depressing the incentives of local farmers to increase their own production, and to diminish the urgency for governments to adopt peasant based rural development policies. Political support can frequently be found or generated to give a higher priority to enabling vulnerable rural groups to have better access to the social services they deem important and for increasing social investments. Public and private investments in infrastructure, technologies and productive capacity could be guided more directly towards employment creation and meeting popular needs. Social costs associated with land degradation, such as accelerated migration, siltation, pollution, reduced biodiversity, a depleted water reserve and the like could be explicitly recognized in public and private accounting systems, supplemented by taxes and standards that induce those who are ultimately responsible, and able to pay, to change their ways or meet the costs (Reed, 1992). International monetary and trading systems could be reformed to be more equitable and supportive of sustainable popularly based development strategies (Daly and Goodland, 1993). In this respect, easing the pressures on developing countries to expand their exports by overexploiting drylands and other natural resources in order to service odious foreign debts could be particularly helpful (Adams, 1991).

But for these favourable policy outcomes to occur, there has to be "political will". This means much more than convincing a few political leaders and planners. It usually implies, among other things, the autonomous organization of vulnerable social groups and

a political system that induces the state to be increasingly responsive to their legitimate demands. It also implies an increased capacity of developing countries to work together in international organizations and fora (South Commission, 1990).

Land tenure: Land tenure issues were prominent in nearly all of the literature reviewed. The significance of land tenure, however, was frequently underestimated, while the difficulties of reforming it were often exaggerated or merely wished away. Property relations are fundamental in determining what groups have access to resources on what terms and who gains or loses during "modernization" processes.

Property is essentially a sub-set of social relationships sanctioned by law and custom. Land tenure implies a bundle of institutionalized rights and responsibilities. Land tenure institutions regulate relationships among individuals, families, social groups and classes, corporate entities and the state in their access to land and its products, including the rights to anticipated future benefits. Clear and secure tenure rights and obligations are a necessary but not a sufficient condition for individuals or groups using the land to invest labour and other scarce resources in conserving or improving it. The benefits from such investments can not usually be realized until some future date.

The necessary conditions of clear and secure tenure rights can be realized under a variety of land tenure régimes whether they be ones of private, communal or of state ownership. When land tenure rules are capricious or break down under outside pressures, however, the tenure régime tends to become one of open access. This can happen whether the tenure régime is formally one of private, state or communal ownership. An open access régime implies that everyone's property is no one's property and often may lead to the

"tragedy of the commons" as a result of many competing users attempting to mine all the short-term gains possible before others can do so first. This, of course, directly stimulates land degradation. State, private and communal tenure régimes can all be conducive to land degradation even when rules are apparently clear and tenure secure, if the only way for those depending on the land to survive is to overexploit it. The same occurs if the broader social system makes it lucrative for a wealthy land manager to abuse the land and invest the gains elsewhere in other activities.

In many dry regions, land tenure is extremely insecure. Customary communal tenure rules may still reign locally, but the state may have adopted other norms of private or state ownership systems that can be arbitrarily imposed at any time when it is advantageous for state authorities or some of the state's powerful support groups, such as large agro-exporters, hydroelectric developers, tourist interests or national and transnational timber enterprises. Moreover, most pastoralist groups have already lost access to much of their customary territories. Also, traditional agriculturists have often been forced to shorten their rotations drastically and to concentrate increasingly on cash crops. Where peasants and pastoralists have successfully intensified production, insecurity generated by exploitive marketing systems and corrupt officials can lead to non-sustainable land-use practices just as surely as can insecure land tenure. In many dry regions the best agricultural land has already been appropriated by a relatively few large producers or landlords.

Insecure land tenure and inadequate livelihoods induces poor land users who can barely survive to mine their resources unsustainably. Calling this a time preference of the poor for immediate over future benefits, as some analysts have done (IFAD, 1986; World Bank, 1991), seems a little bizarre. Pastoralist and peasant groups even when desperately

poor often managed their land sustainably for centuries. Through trial and error they learned that the optimum rate to exploit a renewable resource was one that would maximize its sustained yield irrespective of the implicit discount rate (Dasgupta, 1982). This was in large part because they did not perceive viable options for survival from other sources. On the contrary, private capitalist or state land managers may in some circumstances deliberately overexploit their resource because they have the option of reinvesting the profits in other much higher yielding activities while passing on the costs of desertification to the rest of society and to future generations.

Reforming land tenure systems is always difficult because it challenges established social relations more generally. Reforms that provide better and more secure access to land by vulnerable groups usually imply that powerful local élites or outsiders have to give up some of their privileges and claims to future gains. The latter may be largely speculative, but meanwhile many landless and near landless are denied secure access.

Land reform of some kind is essential in most dryland contexts if desertification is to be controlled at acceptable social costs. This could imply providing the state's legal sanction and protection for customary land systems in many circumstances. The economics of managing low productivity range land and many forest areas are such that efficient and equitable common property régimes that are self-administered would often be preferable to the expensive cadastrals and other legal-administrative costs implied by effective private or state ownership. In many agricultural regions where customary tenure has already broken down, and especially where good land has been monopolized by a few large holders, redistributive reforms may be required dividing the land among individual families, or possibly small co-operatives. The political obstacles are always great.

Depending on the context, the goals of land reform can sometimes be approached through credit and tax reforms, complemented by ecologically based land-use zoning. Access to credit on favourable terms for land acquisition and production by the landless and near landless could help these vulnerable groups take advantage of their underused labour and managerial potentials. Progressive land taxes that exempt smallholders with access only to what is required for subsistence but that charge taxes approaching rental rates for the land held by speculators and large commercial producers could also theoretically be very effective tools for bringing down the price of land for the poor while stimulating improved land use. They could penalize unsustainable uses by helping to internalize the costs of careless land management.

Such an approach, however, is politically and administratively difficult. It is usually impossible in poor countries and regions. To be feasible, it would have to be locally administered by the communities affected with the support of state power when required. Both communities and the state would have to be sufficiently democratic so that the credit, tax and zoning rules would benefit important groups of the rural poor and provide them with real security and incentive for sustainable land management. Landholding élites are usually very powerful, enabling them to use credit and tax reforms ostensibly designed to benefit the rural poor and protect the land to strengthen their own privileged positions (Barraclough, 1991a). In spite of these difficulties, land reforms are essential for improved natural resource management in most dryland regions. More effort has to be dedicated to bringing them about.

Farming systems: Developing more productive and sustainable farming systems should have a high priority in dryland regions. Such farming systems could contribute to

improving the food security of vulnerable groups while at the same time protecting land resources from degradation. This issue, of course, is closely related to those of policies, markets, land tenure and demographic change. Moreover, just as land tenure issues imply those of social relations more generally and policy issues suggest those of political power, governance and the nature of civil society and of the state, farming system issues directly call into question much wider ones of technology and economic structures locally, nationally and globally.

The literature review strongly supports the notion that traditional cropping and pastoral systems, if judged by environmental and livelihood criteria, have often been superior to modern ones depending on new technologies and the purchase of many externally produced inputs. Indigenous systems were often less risky, more equitable and made fuller productive use of available human and natural resources. Modern science and technology can make a big contribution. Nonetheless, it is much more difficult and complex than has been widely assumed to introduce modern technologies without their being accompanied by negative social and environmental impacts. To the extent possible, improved farming systems should be based on the accumulated knowledge and experience of indigenous populations.

Low-external-input systems tend to be advantageous also because they are less disruptive of traditional social systems and minimize dependency of local people on volatile terms of trade in national and international markets. Especially in poor countries with small industrial capacities, external inputs of chemical fertilizers, pesticides, machinery and the like, as well as of petroleum, have to be imported from abroad. This increases national dependency on aid, exports and loans. Small farmers and pastoralists dependant on a high

proportion of externally purchased inputs are also often exploited by intermediaries and officials at all levels. Moreover, high external input farming systems tend to be intensive in the use of energy from fossil fuels both directly and indirectly while economizing in the use of labour which is often the low-income farming community's most abundant resource.

One should be realistic, however. Where opportunities exist for financially profitable lines of production for national and international markets that require purchased inputs, outside entrepreneurs are probably going to exploit them sooner or later with or without the consent and co-operation of local groups. Moreover, many traditional or transitional farmers and herdsmen will want to enjoy the conveniences and perceived benefits of labour-saving machinery, chemical inputs, manufactured consumer goods, including eventually such "luxuries" as televisions and private cars enjoyed by the rich in their own countries and by their farmer and worker counterparts in the industrialized ones. Traditional farming systems are vulnerable to the triple pressures of the search for profits by outsiders, the consumerist aspirations of the poor still struggling barely to survive and the drive by state and private "developers" to "modernize" "backward" societies and social groups. An external context of strong and well designed popularly based policies and institutions is essential for improved indigenously based farming systems to prosper. These problems are frequently made more acute by population growth in rural areas where alternative sources of livelihood are scarce and unattractive either locally or elsewhere.

Another problem is that indigenous farming systems and environmental lore are always rather site specific. A few aspects can be transferred and diffused elsewhere, but this is the exception that proves the rule. Similarly, improvements or adaptations based on modern science also tend to be difficult to incorporate in diverse ecological contexts. This

implies a great deal of decentralized research with specific local groups before possibilities of improving sustainable outputs by incorporating new innovations into their farming systems can become a reality. Such research has to be both socio-economic and technical. It requires an understanding of the implications of introducing innovations for local livelihood systems and the natural environment.

Local farming systems everywhere are becoming increasingly influenced by the production and consumption patterns (with the technologies these imply) that are dominant in national societies and in the industrialized countries. These industrial systems dominate national and international markets. They largely determine what is available commercially, and at what relative prices, in the way of consumer goods, production inputs, capital goods and technologies. This is the case even in remote rural areas. Countries such as China and India that emphasized local self-reliance after 1950 are becoming more and more integrated into a global industrial system (Gadgil and Guha, 1992). This is in part a result of their "development". But it will not be sustainable unless ecological and social issues are successfully resolved.

Ultimately, the issue of developing and maintaining sustainable and equitable farming systems in poor dryland regions is closely linked with national and global economic structures. These will eventually have to be reformed in practice towards more sustainable, less polarizing production and consumption patterns. Meanwhile, much can still be done in many places to improve farming systems and other sources of livelihood locally, sub-nationally and nationally. But it will be inevitably partial, transitory and extremely difficult.

Demographic change: Continued rapid population growth in most developing countries for the coming several decades is a reality that can not be wished away. Although the rate of increase is slowing in several countries, it still implies a doubling of the world's population during the next four decades. Most of this increase will take place in developing countries in spite of a trickle of emigration to a few of the rich ones.

The current stress on the global environment, however, is primarily the result of production and consumption in the rich countries that are responsible for some four-fifths of energy consumption and industrial pollutants. The poor consume very little in comparison in spite of being the vast majority. The so-called population and environmental crises are rooted in environmentally and socially unsustainable socio-economic structures and consumption patterns benefiting primarily relatively small minorities of the world's population. The social and environmental implications could be truly catastrophic if past trends were to continue, or if they were to change only to the extent that technologies become marginally less wasteful and polluting while an ever growing number of people in poor countries adopt today's rich country life styles. A goal of global population stabilization towards the end of the next century and zero net growth thereafter is the only realistic one for a sustainable planet according to many analysts who have seriously considered the ecological, social and political implications of a continuation of present demographic and socio-economic trends (Goodland and Daly, 1993). But this implies major modifications in production and consumption patterns of the wealthy as well as improved living levels and opportunities for the poor.

Desertification and deforestation are commonly blamed on population growth and poverty. In one sense, this is a truism because if there were no people there could be no

anthropogenic causes of desertification. Numerous case studies, however, suggest that the relationships between population dynamics and environmental degradation are much too complex to support sweeping generalizations about cause and effect (Ghimire, 1993). In some contexts accelerating land degradation at local levels seems to be closely associated with rural population increase. Closer examination, however, usually reveals that land tenure systems, the expansion of commercial farming or ranching and various public policies were much more convincing explanations of desertification. In some cases, population increase stimulated the adoption of more sustainable farming systems and land-use practices than had prevailed when population densities in the same region were considerably less. In others, as was seen earlier, declining rural populations due to rapid out-migration, war or epidemics were accompanied by accelerated land degradation. There simply were neither the incentives nor enough labour in these depopulated communities to maintain traditional terraces, canals and land protecting practices once the population dropped (Barraclough and Ghimire, forthcoming).

Population projections for the next few decades at national and international levels have to be taken very seriously in planning development strategies and desertification control programmes. Locally, however, population growth may often be reversed rather rapidly, or population may unexpectedly explode, due principally to migrations. There are no simple predictable cause and effect links between population growth and land degradation at either national or local levels.

Population growth is seldom perceived as an urgent problem by the vulnerable groups affected by droughts and falling land productivity. The style of development generated by the expanding world system, of which they are among the principal victims, creates strong

incentives for them to have many children. Large families are often seen as a source of badly needed family labour, as insurance for old age, as potential migrants who could send remittances, and to assure family reproduction in the face of traditionally high child mortality rates. Slowing population growth is going to require much more than contraceptives and family planning. Among these other factors are improved food security, good education and health services, better security for the aged, more opportunities for women and improved social and economic conditions generally for vulnerable low-income groups. These requirements converge with those that could also contribute to a social context in which improved natural resource management becomes feasible. There are no simple linkages between land degradation and population growth, but real social development would greatly facilitate the control of both.

III. Summary of Tentative Conclusions

This selective review of the literature allows several tentative conclusions concerning the social dimensions of desertification. Perhaps they should merely be considered as working hypotheses. These conclusions implicitly suggest recommendations for UNEP and others attempting to improve natural resource management in dryland regions. Recommendations, however, tend to be mere platitudes if they are not based upon a good understanding of the objectives, constraints and possibilities of the different social actors for whom they are intended and also of those who will be affected if they are implemented. Hence, this concluding section is followed by an appendix pointing to a few additional research priorities.

The concept of desertification

This review of social issues attempted to follow the UNCED definition of desertification as being "land degradation in arid, semi-arid and sub-humid areas resulting from various factors including climatic variations and human activities".

An ambiguous concept: Application of this concept in practice becomes very problematic as a guide for analysing the social dimensions of desertification. Land degradation is a social concept that involves judgements about what constitute production and productivity. These are value judgements that will vary from one social context to another. Even when there is ideological agreement about what criteria to use, there are numerous technical difficulties and controversies in measuring and monitoring dryland degradation. Moreover, degradation results from countless combinations of natural and social processes that differ widely from place to place and from time to time. It also takes place in diverse ecosystems that exhibit divergent capacities to recover following man-made or natural disturbances.

The ambiguities inherent in the concept of desertification make it more useful for mobilizing political support to combat what is often imagined to be advancing deserts than for analysing the multiple natural and social processes generating various kinds of land degradation and the social impacts associated with them. The implications of these processes have to be well understood in order to propose effective remedial actions leading to improved natural resource management in dryland regions.

Use the term desertification prudently: The term desertification should be used

prudently in order to avoid cynical disillusionment by governments and donors mobilized to combat it when they discover how imprecise and controversial the concept really is. Nonetheless, they would often be willing to devote resources to support programmes promoting improved natural resource management if they were based on solid diagnoses of the issues.

The extent of desertification

There is a great deal of disagreement about the extent of desertification and the numbers of people at risk. This is in part a result of the conceptual and measurement difficulties mentioned above.

Areas affected: UNEP's and UNCED's estimates of 3.6 billion hectares in dryland regions undergoing land degradation lose credibility when one discovers that soil degradation was believed to have taken place on only about 1.04 billion of these hectares. While many changes in vegetative cover alone are clearly land degrading, the longer-term impacts on land productivity of many other vegetative changes often called degrading are highly debatable. There is a strong case for placing greater emphasis on the extent and severity of different kinds of soil and vegetative changes when discussing the extent of land degradation in dry regions. Lumping them altogether under the rubric of desertification can be misleading, especially when attempting to assess the social dimensions of land degradation.

Number of people at risk: The estimate of 900 million people at risk from desertification is based on FAO estimates of the agricultural population in dryland regions where land degradation is believed to have occurred or is in danger of occurring. This

datum is not very helpful in assessing the social dimensions of dryland degradation. Large social groups both within and outside of dryland regions may be seriously affected to the extent lower dryland productivity may influence global markets and prices or contribute to large out-migrations. Much larger groups may be at risk in the future due to narrowed options associated with eroded soils, diminished biodiversity and local climate changes. There is little hard evidence that dryland degradation has much influence on global climates. Externalities such as increased flooding, lower water tables, sedimentation, fuelwood shortages and the like associated with dryland degradation may affect large urban populations. Finally, different social groups are affected in diverse ways. A few may even reap benefits from land degradation in some circumstances.

More emphasis could usefully be placed on indirect risks from desertification for large population groups due to externalities and narrowed options for future generations. There should also be greater recognition that different groups of present-day agriculturalists and pastoralists are not equally threatened by dryland degradation.

Causes of desertification

The UNCED definition of desertification clearly states that it is a result of various factors including climatic variations and human activities. Diverse combinations of natural and social processes cause dryland degradation of widely varying types and severity in different times and places.

Interacting causes: Historical, archaeological and palaeoecological evidence indicates that desertification in the past was frequently caused by climatic changes that were not

influenced by human activities but that nonetheless resulted in devastating social impacts. In other cases, shortsighted or careless management of natural resources were among the principal causes of destructive deforestation, soil erosion, salinization and waterlogging. Currently, there is compelling evidence that human activities may be influencing global climate changes and will probably do so more in the future, principally through greenhouse gas emissions from industrial sources. There is still much uncertainty about this, however. In any event, dryland degradation apparently plays a minor role in global climate changes, although its impacts on local climates can be great in some circumstances and minor in others.

Direct versus indirect causes: The so-called direct anthropogenic causes of land degradation are to some extent tautological. Overcultivation, overgrazing, careless irrigation, deforestation and the like are often said to cause land degradation. At the same time, they are frequently used as criteria for estimating its occurrence and severity. This is similar to saying that poverty is caused by low incomes or that drought is caused by an absence of rain. Explanations of social causation imply analyses at local, national and global levels of multiple interacting relationships and processes generating dryland degradation and non-sustainable development.

The multiple interacting indirect causes of desertification have to be confronted in order to design effective policies leading to improved natural resource management at local levels. Commonly cited indirect causes such as demographic growth, policies and market forces, consumption patterns, technologies, land tenure systems, climatic change and the like can have divergent and often contradictory impacts in different contexts.

Flexible policy mixes have to be adapted to the unique characteristics of each locality. Simplistic attributions of dryland degradation in general to only a few direct or indirect causes is usually misleading.

Social impacts of desertification

Divergent impact for different groups: Dryland degradation has divergent impacts for various social groups. Social consequences will also diverge in different contexts. In some circumstances drought and land degradation can lead to small minorities benefiting at the expense of more vulnerable groups. Moreover, the impacts for many non-agricultural groups in addition to dryland cultivators and pastoralists can be significant. This is due to externalities such as reduced water supplies, higher food and fuel prices, floods, pollution and accelerated out-migrations, as well as to reduced options for unborn generations.

Importance of externalities and reduced options: Greater attention could usefully be paid by UNEP and other organizations combatting desertification to indirect social consequences of land degradation due to externalities and narrowed options affecting dryland agriculturalists and pastoralists as well as much wider populations both now and in the future. At the same time, there should be more recognition of the differential implications for various social groups believed to be at risk because of their direct dependence on degraded drylands.

The remaining conclusions deal in more detail with social causes and consequences of desertification, taking into account the perceptions of vulnerable groups.

Local level perceptions and dynamics

Local social systems in dryland regions are highly diverse with unique historical and ecological contexts. Those proposing national or international programmes to improve natural resource management should be acutely sensitive to local differences. They have to think globally but act locally. At the same time, they have to act globally and nationally taking into account the wide range of local conditions and perceptions that their policies are designed to influence.

Elusive land managers: Key land managers are very difficult to identify in customary communal systems. Decisions concerning land use and pastoral or farming practices, as well as those about investments of various kinds, marketing and consumption, are often widely diffused within communities and extended families according to complex traditional rules and inheritance patterns. In many latifundia systems with multi-layered subtenancies and debt peonage it is also very difficult to find the key land managers. The same is true of small holder systems in which cash crops are being financed by or shared with landlords, merchants or moneylenders.

Who makes which decision has to be investigated through anthropological sleuthing in a wide variety of contexts. Without such information, combined with an understanding about the objectives and perceptions of the different decision-makers, it is practically impossible to design effective local level programmes to improve land management. Most poor peasants and pastoralists, for example, are primarily interested in maintaining and improving their meagre livelihoods. Preventing land degradation is usually a concern only to the extent it affects their whole livelihood system. Better off groups such as larger

commercial farmers and many local élites may be primarily concerned with profits or social status.

Divergent perceptions: Vulnerable pastoralists' and peasants' perceptions of the most urgent and immediate threats to their livelihoods include alienation of traditional lands, insecure land rights, armed conflicts and brigandage, excessive rents, fees or taxes, exploitive markets and credits, absence of rudimentary public services and the like. Drought is usually perceived as a serious problem, but not one that can be averted by local efforts. Programmes designed to improve natural resource management have to deal with these diverse local realities and perceptions in dryland regions. UNEP's question about what dryland managers need in the way of assistance is not answerable in general terms.

The same is true concerning UNEP's question about the social impacts of drought and land degradation. Subordinate social groups with few resources will inevitably be among those most negatively affected. They may frequently blame drought and land degradation for their plight, but only as contributing factors. Deeper probing always brings out many other fundamental grievances such as those mentioned above.

Grassroots responses

Vulnerable pastoralists and cultivators in dryland regions are not passive fatalists when their livelihoods are threatened by drought and other adversities. They respond in many ways, but responses are shaped by their perceptions of the threats and opportunities confronting them. These may be rather different from those of government officials or of those in development and aid organizations.

Coping with adversity: The most common peasant response is to adapt customary production and consumption patterns to increasingly difficult circumstances. These so-called coping strategies frequently imply reduced food consumption leading to undernutrition and many other sacrifices in order to maintain enough productive assets to resume traditional production in less adverse times. They also often imply accelerated land degradation associated with over-use of inadequate natural resources. These abuses of land and health seldom arise from the peasants' carelessness or ignorance, but rather from necessity in order to survive.

Emergency relief programmes can sometimes alleviate immediate suffering. They will contribute little or nothing to better land management and longer-term protection of livelihoods, however, unless the root causes of vulnerability to drought and other adversities are attenuated. Programmes aimed at diminishing starvation and malnutrition are important for humanitarian reasons. They are only palliatives unless they also contribute to real sustainable development. This requires much more than locally focused emergency relief and land conservation efforts.

New livelihood sources locally: Another coping strategy has been for members of dryland vulnerable groups to find alternative sources of livelihood in or near their traditional communities. This often takes the form of engaging in petty trade or providing services to neighbours with more animals or crops. The total basic food and fuel supplies in the community are not increased as a result, but they may become more widely distributed.

Intensifying farming systems to produce more food for consumption or sale has become extremely difficult in land degraded regions without considerable outside support.

More intensive use of local natural resources often accelerates land degradation. Increased production and sale of cash crops frequently implies the use of purchased inputs such as seed and fertilizers, as well as investments in infrastructure such as transport and irrigation. Even then, these farming systems may not be sustainable because of unfavourable prices and land degradation. New rural industries creating gainful employment also require markets and outside investments that are always in short supply.

Only occasionally has generation of alternative sources of income locally offered a solution for those whose livelihoods are threatened in dryland regions by drought and the host of other adverse factors. There are exceptions where intensive cash cropping systems, ecotourism or rural industries have apparently prospered for long periods and could be sustainable. Explanations of these apparent successes have to be sought principally in the broader society.

Migration: A third response by members of vulnerable groups has been to migrate either temporarily or permanently. This has been a common strategy for maintaining livelihoods. It often contributed to land degradation somewhere else and implied many hardships.

Whether migrants should be considered as ecological refugees, or economic or political ones, is frequently impossible to determine except in an arbitrary way. In some cases, drought and land degradation may have been merely catalysts determining the date of departures that would have occurred anyhow at some other time for reasons such as land alienation, indebtedness, war, political oppression or the quest for better opportunities. In other cases, desertification and drought may have been the major causes of out-migration that

would otherwise have been indefinitely deferred.

Collective initiatives: A fourth response by peasants and pastoralists has been collective resistance to land alienation and related processes threatening their livelihoods. Resistance was sometimes combined with collective efforts to improve land management and productivity. Such collective actions on the part of vulnerable groups are extremely risky for those undertaking them as they may threaten the vested interests of local élites, of the state or of other more powerful social actors.

Collective initiatives are frequently violently repressed. Where vulnerable peasant groups were able to find allies in other sectors of the national society and internationally, they have occasionally been successful in defending their lands, at least temporarily. Key factors leading to favourable outcomes seem to have been autonomous democratic organization of the vulnerable groups, a supportive state, or at least one somewhat respectful of legal processes and basic human rights, and a civil society in which they could find allies.

The self-organization of vulnerable groups with the objective of increasing their control over resources and institutions directly affecting them is usually essential in order for the powerful to take their problems seriously. When they are organized with some degree of autonomy, the state and other social actors are likely to view them as potential allies or opponents whose interests have to be taken into account. One policy implication of this conclusion is the need to promote respect for basic human and civil rights together with democratic institutions and procedures accessible to vulnerable pastoralists and small cultivators.

Programmes to control desertification



Policies and programmes aimed at halting or reversing soil degradation have mostly focused on its so-called direct causes. For example, pastoralists were often prohibited to burn dryland pastures and grazing was often forbidden in wooded areas. Shifting cultivation was prohibited or penalized in some places. Afforestation of eroded lands was undertaken, sometimes on massive scales. Shelterbelts were frequently planted. Agroforestry, contour plowing, terraces, bunds and other soil conservation practices have been vigorously promoted. Efforts were made to stabilize sand-dunes by planting resistant grasses, shrubs and trees. Wasteful irrigation practices resulting in salinization were discouraged. Large areas were set aside as parks or other protected areas. Boreholes were drilled to provide water for livestock and efforts were made to limit livestock numbers while improving their quality. Large irrigation and resettlement projects were frequently undertaken. This list could be lengthened.

Disappointing results: Several of these land improvement programmes were relatively successful according to land conservation or social criteria for limited areas and for limited time periods. They were only rarely successful, however, by both social and ecological criteria. Overall, they apparently had little impact on dryland degradation in developing countries. "Successful" small projects have seldom been replicable over large areas. They have usually been unsustainable after active international or national financial and technical support diminished, ceased, or was diverted to other objectives.

Reasons for failure: The reasons for only very limited success have been varied. The absence of vulnerable groups' participation in setting the objectives and in subsequent

programme administration is prominent among them. Frequently corruption or inadequate resources were blamed. An inherent bias of many desertification control programmes and policies in favour of élite groups and against the most vulnerable ones went hand in hand with the lack of real popular participation. Contradictory policies and institutions were prominent obstacles.

Projects and programmes were seldom designed to meet vulnerable participants' livelihood concerns. Instead, they emphasized land conservation objectives and outsiders' perceptions of the peasants' problems. Government and international support tended to be short-term and unpredictable. The more profound social causes of dryland degradation were usually treated superficially or simply neglected.

Key societal issues

In an increasingly global economy, issues of dryland degradation cannot be dealt with adequately at only local levels. The principal social processes and institutions driving desertification and inhibiting improved resource management locally are rooted in their national and international context. In order to confront localized land degradation problems effectively, public policies and market forces have to become much more supportive of sustainable development efforts. Land tenure systems and wider social relations have to be modified in the same direction. Farming systems, technologies and economic structures all have to become increasingly sustainable. Effects associated with demographic changes have to be approached in a more realistic manner than they have been in the past.

Popularly based strategies: Effective desertification control requires national and

international strategies that focus primarily on promoting sustainable development. National strategies will have to be popularly based, both in the sense of placing a high priority on the needs and aspirations of vulnerable social groups and of the real participation of these groups in formulating the strategy's objectives and in its execution when it directly impinges on their lives. International institutions, policies and strategies will also have to become more democratic and responsive to the needs of poor people in poor countries. This is utopian, but anything less will fail. Technocratic strategies that are not popularly based will inevitably become socially unsustainable.

Policies and market forces: Policies and market forces have to be considered together. Policies designed to improve dryland resource management will necessarily rely on market forces to some extent in order to achieve their objectives. On the other hand, market forces are guided by the policy and institutional frameworks within which they must operate. Market failures and policy failures are two sides of the same coin. Both policies and market forces will have to be directed towards promoting poverty alleviation, social solidarity and ecologically sustainable development as primary goals.

It is impossible to generalize about what policies should be adopted in specific countries to improve natural resource management as each situation is different. National strategies should, among other things, attempt to provide real opportunities and incentives for vulnerable pastoralists and peasants as well as for better off operators in dryland regions to manage their natural resources sustainably. At the same time, they have to improve livelihoods. Price, trade, credit, investment, social, fiscal and other policies all have to be designed to contribute towards meeting the priority objectives of sustainable development. The crucial point is that such strategies will have to be popularly based.

International policies also have to be modified. Pressures on poor countries and poor people to overexploit natural resources in order to increase exports are enormous. Writing off unproductive odious foreign debts could help to bring relief. So too could a meaningful code of conduct requiring transnational corporations to observe minimum ecological and social norms in their investments, production and trade. More serious attention could be given by international organizations to developing accounting systems both for governments and transnational enterprises that capture environmental and social costs associated with industrial production and consumption patterns, natural resource degradation, poverty and the like. Structural adjustment programmes could be given both a more human and a greener face. Additional international resources could be mobilized and channelled to support sustainable development strategies. Particularly important could be the evolution of more effective and democratic institutions capable of resolving international conflicts peacefully. It should then become possible to divert much of the some 5 per cent of the world's total economic product now devoted to armaments to the social goals implied by sustainable development. This wish list too could be indefinitely extended.

Land reforms: Any sustainable development strategy would have to deal with issues of land tenure in dryland regions. In most countries, insecure and inequitable land tenure systems are among the principal factors contributing to dryland degradation. Land reforms aimed at providing equitable access to land by those actually working it and providing them with secure clear rights (and obligations) associated with their land tenures are essential, although not sufficient, for improving natural resource management. International organizations could be much more effective than they have been in working to help bring about such reforms.

The kinds of land reforms most appropriate for specific countries and situations have to be worked out locally in consultation with vulnerable agrarian groups and the other social actors. The principles of secure and equitable access with clear rights and obligations provide general guiding norms. Land tenure implies a sub-set of social relations. The national state has to play a crucial role in the existing "world order" ("disorder"?) as it is the "sovereign state" that ultimately sets the rules concerning property rights and arbitrates their application. Of course, this assumes a state with sufficient legitimacy and political resources to play this role, which is by no means always the case in practice.

Many dryland regions are located in countries where customary communal tenure systems still operate in practice. Nationally, however, the property régimes legally recognized by these states are primarily those of private and state ownership. This introduces intolerable uncertainty of tenure for participants of communal property régimes as their customary rights may be rather arbitrarily abrogated at any time. This is presently the case in much of Sub-Saharan Africa as well as a few regions in Asia and the Americas. Moreover, customary communal systems frequently have functioned rather well in providing equity of access to land as well as clear rights and obligations for their members. They were particularly well suited for managing low value range and woodlands where costs of establishing cadastrals, land registries and other requisites for effective private property or state property régimes would be prohibitive as well as being very questionable for social reasons.

A priority reform in regions where customary communal tenure systems are still vigorous would be for the state to recognize customary land rights. This would provide greater security for community members from the danger of encroachment of their land

rights by private interests or by the state. Of course, this would have to be accompanied by norms to guarantee continued democratic participation by the communities' members and to prevent excessive concentration in the control of communal lands by small élites. These rules would preferably be worked out with the communities concerned.

In dryland areas where customary tenure systems have already broken down or never existed, other kinds of land reform measures have to be envisioned. Clear and equitable rights and obligations are possible under communal, private and state property régimes.

Sustainable farming systems: Policy reforms and land tenure reforms could greatly facilitate the emergence of more sustainable farming systems in dryland regions. The literature suggests that to the extent possible such farming systems should be based on indigenous knowledge and the use of local resources in each locality. Growing integration into national and international markets, however, inevitably implies selective use of purchased inputs and technologies.

There should be greater support for site specific research aimed at integrating traditional indigenous knowledge and practices with the insights of modern science into ecologically and socially sustainable farming systems. Such systems should be developed with the participation of the local groups who will use them. Pastoralists and small farmers will usually want to find production systems that improve their livelihoods without excluding members of their communities. Sustainable farming systems that use available labour productively while economizing in the use of externally purchased inputs would be the ideal. Constraints of resources, markets and price relations often make attainment of this ideal difficult or impossible. Creation of off-farm productive employment would remain a major

issue in most dryland regions.

Eventually there will have to be major changes in production and consumption patterns and technologies throughout both the industrial and industrializing world. Ever growing demands for natural resources are generated by industrial production and consumption systems in the developed countries and increasingly in developing ones. These put additional pressures on natural resources in dryland regions. These pressures are transmitted from industrialized countries and urban centres in poor countries to dryland areas through institutions, policies and market forces. Additional environmental stress results from industrial pollution and greenhouse gases. These are global issues that require international attention.

Demographic trends: Population growth also contributes to pressures on natural resources in dryland regions. The stress on land and water resources attributable to demands generated by the poor, however, is very small in comparison to those attributable to industrial activities and to the consumption patterns of the rich. Consumption of natural resources by the very poor is rather insignificant in most countries. Within dryland regions, the relationships between population dynamics, natural resource degradation and development are extremely complex and often contradictory. It is simplistically misleading to treat population growth and poverty as the principal root causes of desertification, as is often done.

Population projections for the next three or four decades at national and global levels have to be taken very seriously. Migrations make them much less reliable locally. Most demographic growth will take place in developing countries.

Present rates of growth imply a doubling of the world's population during the next four decades. This rate of demographic growth would be unsustainable if it were to continue during the twenty-first century, or if it were to decline only slightly. On the one hand, if the dominant development style continues to leave a majority in poverty while only a minority become better off, this would inevitably lead to social chaos. On the other hand, if the vast majority of the world's population were to adopt present industrial country production systems and life styles, the pressures on the natural environment would become intolerable.

There are clearly limits to demographic and economic growth as they have been conventionally defined. The only way out of this dilemma is for the content and meaning of development to change in practice in both developed and developing countries. In the future, quality will have to take precedence over quantity.

An important implication of this conclusion is that real social development is an indispensable component of any sustainable development strategy. There is no other acceptable way to bring down population growth rates. Increasing security, living levels, education and opportunities of the poor is essential for achieving a stable world population. Fortunately, the same type of social development that could eventually check demographic growth could also make sustainable management of natural resources in dryland regions a much more feasible goal.

1. Some readers have questioned this statement. Measures of land productivity imply a ratio of socially desired output (product) to an area of land (input). Outputs can be expressed in physical terms such as tons or calories of food and biomass, numbers of diverse species and the like. Alternatively, productivity can be estimated in qualitative terms such as aesthetic or moral and philosophic satisfactions, or in economic terms of gross or net monetary values per hectare. In today's global economy there is a growing tendency to estimate land productivity in monetary values that are linked to commodity prices in international markets. This does not make economic valuations any more scientific or less socially determined than are alternative measures. In any event, markets are constantly changing. Even when there is some agreement about what measures of productivity to use, however, the technical problems remain extremely controversial. There are several good reviews of some of these technical difficulties in estimating land degradation (Blaikie, 1985; Horowitz, 1990).

2. UNCTAD cites an OECD study estimating that in OECD countries transfers from tax payers and consumers (through higher prices) to support their agricultural policies amounted to 299 billion dollars in 1990. These policies undoubtedly helped improve the livelihoods of their remaining farmers, although very unequally. They also generated huge market surpluses that were very expensive to manage. Using the same perverse logic that led them to conclude that most developing countries are underpolluted, narrowly focused neoliberal economists might even argue that in a world of unmarketable agricultural surpluses and high farm subsidies there is no net current economic cost to society from lower agricultural production on degraded drylands.

3. There are several other good case studies. An outstanding one is Watt's research with the Hausa in northern Nigeria (Watts, 1987).
4. [Another underestimated and underdeveloped area is the commercialisation of wild dryland plant products (Stiles, 1988) - Ed.]

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**SUPPORTING LOCAL NATURAL RESOURCE MANAGEMENT INSTITUTIONS:
EXPERIENCE GAINED AND GUIDING PRINCIPLES**

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Introduction

The subject of natural resource management is a very broad one that potentially covers all the major regions of the world, as well as a range of resources such as land, water, pastures, forests, fish, wildlife and others. What this paper tries to do is provide a brief synthesis of material describing the experience gained from participatory natural resource management techniques from a developmentalist perspective. Three case studies highlight different types of management systems and common problems. The paper also suggests some guiding principles for implementation based on a preliminary review of the lessons of the past.

Common property resources and traditional management systems

The field of common property resource management (CPRM) has seen tremendous growth over the last decade and has become the focus of intense interest, particularly by international research and development organisations. Studies in different parts of the world have established the important contribution of local political institutions and indigenous knowledge

to the complex resource management and customary land use regulations that have evolved in dryland areas. These institutions continue to play important roles in both pastoralist and cultivator communities, often complementing or accompanying private management systems. They have also often been misunderstood and their potential contribution neglected (Little et al., 1987).

Natural resources can be held under any one of four property rights regimes: open access, communal property, private property and state property. This paper will concentrate on the first two types within this analytical typology, although in practice it is more difficult to neatly categorise natural resource management in this way (Murphee, 1993). Any attempt to understand traditional management systems must draw a clear distinction between the commonly confused concepts of open access regimes (characterised by lack of control and availability of the resources to everyone) and common property regimes (controlled by an identifiable group which regulates access and the rules of behaviour for resource use) (Messerschmidt, 1993).

Common property regimes are often controlled or owned by powerful groups (lineages, clans, families etc.) who can enforce informal regulations and social pressures over a far greater area than is possible under individual ownership. Diminishing autonomy of local institutions over land use, however, makes control more difficult and forces communities to shift to more short-term strategies. In the inland Niger Delta of Mali, for example, effective systems of natural resource management are being destroyed by extractive government policies, the monetisation of the of Delta's economy and recurrent drought. In the process the linkages between knowledge of resources, dependence on their sustainable production and responsibility for their management are broken down, allowing outsiders with

more short-term interests to exploit the local systems and resources.

The current trend of ineffective state control over resource tenure, and the breakdown of local management institutions, is widespread. However, there are also many examples of highly successful collective management of natural resources. Some represent the continuity of traditional systems, others are formed with external assistance (Makuku, 1993; McCay & Acheson, 1988). In either case, it is increasingly realised that many communities have (or had) effective tenure and natural resource systems that can form the institutional basis for sustainable natural resource management projects. At the local level, the main prerequisite is the establishment or strengthening of such communal property regimes with defined groups that have 'proprietorship' (sanctioned use-rights) over the natural resources concerned, particularly control over exploitation and benefits. At the national level, strong policy objectives will also be required to overcome the reluctance of centralised government authorities to relinquish control over resources (Murphee, 1993).

Participatory approaches

Decades of international development efforts have revealed the limitations of a technical approach which places low priority on socio-economic factors in environmental projects. The need for participatory 'bottom-up' approaches that attempt to support local knowledge and management systems is now generally accepted. This is reflected in the recent proliferation of small-scale projects designed and implemented at the village level, mainly supported by NGOs. More recent programmes have attempted an integrated approach of strengthening of natural resource management, such as combining soil and water conservation strategies with household energy issues (Critchley & Graham, 1990).

Participation by the 'beneficiaries' of a given project in its design, implementation, and evaluation is a prerequisite for sustainability for several reasons (Toulmin, 1993). Firstly, it is now recognised that indigenous technical knowledge is complex and sophisticated, and can provide a useful basis on which to build interventions. Secondly, many failures of previous projects can be attributed to their lack of response to local priorities and needs. Finally, establishing local rights and responsibilities constructs a pattern of long term interests and incentives to engender a sense of "ownership" of project activities.

Donors must ensure that they do not endorse a weak version of participatory management that does not genuinely allow local communities tenure rights to the resource and its benefits. In other words, collective local management should not be seen as a cheap option for financially hard-pressed government departments (Messerschmidt, 1993). A recent review of natural resource management institutions makes it clear that conservation efforts are only undertaken by local people if the benefits outweigh the costs (Murphee, 1993). The validity of this argument is illustrated by the case studies that follow.

Case studies

While there is an immense body of literature covering both CPRs and the debate on participatory approaches, far less has been published that links these two fields and provides concrete examples of experiences and models that could be used. Despite the rhetoric of concern over environmental degradation and participatory approaches in policy documents over the past decade, it is still early days in terms of the actual implementation of such projects.

The case studies outlined briefly below feature three different types of participatory natural resource management: first, the survival of an existing forest management institution; second, the re-empowerment of a traditional community institution to address land issues; and third, the establishment of new institutions through an externally sponsored wildlife management project. The objective of these case studies is therefore to demonstrate both the range of management institutions and natural resource types that can be found in practice. When analysing such case studies it is also important to draw a distinction between the levels of control exercised over natural resources: no community use allowed (national parks), partial use and responsibility allowed (buffer zones and conservation areas), and authorised local use and management (remaining commons). Often several of these levels of control operate simultaneously in the same area so that the linkages must also be examined carefully.

Case study no. 1: Survival of traditional management institutions -Jiri management, Bikita District, Zimbabwe

With the emergence of the state and central government, especially after independence in 1980, traditional systems that had provided the foundation for sustained management of resources within the territorial boundaries of chieftaincies were widely disrupted. Traditional (informal) leaders lost authority to administer land and resources when government-designed institutions such as the Village Development Committees (VIDCOS) and Ward Development Committees (WARDCOS) were installed. The new formal institutions lacked the authority, and as a result formerly communal resources, such as forests, grazing and water were rapidly depleted under open access regimes.

The Norumedzo community in Bikita District of Masvingo Province has been able to

continue a long-standing management system of the a natural forest, called *jiri*, in their area. An important insect called *harurwa* has been harvested from the *jiri* and bartered for trade for many generations. The origin of the *harurwa* is explained in a myth about the forefathers of the Norumedzo people. A ceremony is organised each year in which the chief selects one of the kraal heads to be in charge of a caretaker team. A rotational selection of representatives from each of the 24 villages act as members of this team based at a camp in the forest. Throughout the harvest period they monitor the forest, ensuring that all the rules are abided by. In other times of the year, families can get permission from the chief for the collection of other products such as fuelwood, fruits, caterpillars, and poles as well as water from the indirect catchment effect of the forest.

How does this management system continue in the face of mounting land pressure in the area? Makuku (1993) puts forward three main reasons. First, the community has maintained its traditional administrative structures which are still responsible for regulating resource use and ensuring a sustained harvest from the forest. Second, the *jiri* and *harurwa* are based on strongly-held cultural traditions and accepted norms in the community. Access is equitable and each member must contribute to the management, thereby minimizing conflict. Finally, although the traditional authorities have no legal rights to administer the communal resources such as the *jiri*, they have maintained recognition and respect by paying tributes of *harurwa* to neighbouring chiefs, the district administrator and the police. The combination of these factors were important in ensuring that the traditional systems for the management of common natural resources survived.

Case study no. 2: Re-empowering of traditional management institutions -

Dagashida assemblies, Bariadi District, Tanzania

Bariadi District lies in Shinyanga Region, formerly the vast territory of the Sukuma chiefdoms. Overgrazing and soil erosion have been perceived as a serious problem by the government and external agencies for many decades in this agropastoral area. Numerous efforts to control 'destructive' traditional practices have not met with success. What are some the factors behind the decline in natural resource management? In some cases traditional institutions (such as the *dagashida*) may need to be adapted to deal with new circumstances.

Participatory research in the area revealed that customary Sukuma land use was characterised by a system of enclosures for the management of natural regeneration which was largely disrupted during the villagisation process in the 1970s. It was also found that the traditional institution of *dagashida* had not been operational for nearly 20 years due to imposition of state governance through formal village councils and statutory law.

The *dagashida* is a traditional community assembly which meets to formulate sanctions and 'customary law', and where members of the community who violate these rules are held responsible. Smaller disputes are handled at the neighbourhood level, while twice a year unresolved disputes are dealt with at a large *dagashida* which gathers together men from several villages. The rules of this form of participatory democracy are strictly followed, each age-set having the opportunity to put forward their recommendations for reconciliation. Once the final decision has been made by the elders it can no longer be challenged. How could this form of community organization be harnessed to tackle

environmental issues?

At the joint initiative of the research team and several villages a special *dagashida* held, which also included women for the first time, to identify the conditions that had frustrated spontaneous efforts to enhance natural regeneration and manage non-cultivated land. Several decisions were taken. The *dagashida* should resume its former responsibilities in regulating access to natural resources and, by implication, the district authorities should withdraw to avoid competing systems. Tree tenure should be recognised on farm, grazing and forest land to control use. Sanctions were established to block the use of specified cattle tracks by farmers, and on cattle passing through farmland without prior consent. Rules were established for the collaborative digging and maintenance of shallow wells, and to regulate water access for different user groups. Sanctions were to be imposed on uncontrolled bush fires. Finally, the *dagashida* commissioned further research on indigenous culture and knowledge.

As in the first example, this case study emphasises the importance of mechanisms for minimizing and resolving disputes. A traditional system was re-empowered, and potentially adapted to assume new powers under the current political conditions. Although the revived *dagashida* unleashed a power struggle in some of the villages, participatory democracy can parallel and complement existing administrative structures, particularly in reinforcing and reconstructing effective common property management (Johansson & Mlenge, 1993).

Case study no. 3: Establishment of new management institutions -

CAMPFIRE Association, Zimbabwe

Although the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) Association is often referred to in the literature, it is still one of the first attempts at integrating communities into natural resource management and can provide some important lessons.

The 1975 Parks and Wildlife Act conferred proprietorship of wildlife resources on private land. The CAMPFIRE programme aims to extend the positive effects of this policy on communal lands by devolving power and decision-making over wildlife and other resources to local people. A high-value resource such as wildlife has successfully generated benefits such as revenue earned through hunting licenses, and sales of skins and trophies. Although the focus has been on wildlife, such revenue provides strong incentives to broaden the programme into management of related resources at the local level such as woodlands, grazing and water.

A recent review of CAMPFIRE argues, however, that benefits from communal resources does not necessarily imply that a satisfactory system of management and use which regulates access to these resources has been established - one which combines production, management, authority and benefit (Murphee, 1993; FTP, 1991). The District Councils were granted rights and responsibilities over the resources and, in theory, to the villages they are elected to represent. The councils are not, however, the producers or managers on the ground and therefore do not represent an effective long-term management system as defined above.

Through the CAMPFIRE process, communities formed new wildlife management committees or wildlife trusts to represent their interests at the district level. Some councils are now taking steps to further delegate proprietorship to the local level with considerable success. This case study demonstrates that a 'demand-driven' need to manage common property resources and balance individual and collective interests can also act as a catalyst for institutional development (Murphee, 1993).

Experience Gained

Keeping these case studies in mind as positive examples of natural resource management approaches, what problems have past projects faced and what lessons can be learned from them?¹ Donor organizations generally do not have a good understanding of the social and economic dynamics of the production systems of the rural societies they work with. Activities (such as wells, schools and clinics) are rarely linked with natural resource management. Such inputs into the community also often confuse participation with better compensation, particularly when resettlement outside of protected areas is involved.

Another common problem is the failure to define clearly who within the community will participate, manage and benefit. A serious lack of institutional analysis to identify effective local community structures that already function within the society has led to a proliferation of institutions created in response to the outside interventions. These new institutions, such as well committees, may undermine existing ones or are too expensive to maintain after project life.

The potential contribution of natural resource management continues to be neglected

in many projects. Possible reasons for this neglect include a focus on private property as a basis for rural development, an inadequate understanding of the relative dependence of different households and interest groups on CPRS, and a lack of recognition of the complementary role of common resources to private ones (Jodha, 1985).

A considerable body of 'success stories' now documents more positive experiences and ways to avoid these common problems (Rochette, 1989). The key ingredients for effective projects have been summarised by Chambers and can be usefully incorporated into efforts to support local natural resource management institutions (in Conroy and Litvinoff, 1988):

- * a flexible Teaming-process allowing projects to change course;
- * putting people's priorities first;
- * providing secure rights and gains for the poor;
- * sustainability through self-help;
- * ensuring high staff calibre, commitment and continuity.

Guiding Principles

Although the concept of community participation in natural resource management is being more widely accepted, the means by which it can be achieved are not fully understood. How can outside agencies best promote collective management systems? An initial set of guiding principles is suggested below:

1. Support

Existing local informal institutions, however imperfect, should be strengthened. Traditional leadership can use social pressure for compliance to laws and provides mechanisms for minimizing and resolving disputes.

2. Empower

② Communities must be granted genuine proprietorship - "the right to use resources, determine the mode of usage, benefit fully from their use, determine the distribution of such benefits and... the rules of access" (Murphee, 1993). Such clearly defined rules and regulations for the access, management and equitable sharing of benefits from the common property resource are prerequisites to the achievement of sustainable use.

3. Enable

The further development of collective natural resource management must be favoured by changes in state regulations in respect to tenure on common property and/or cooperative organization. Without such changes conflicts and power struggles will be inevitable and the management system may not succeed.

Key Questions

Apart from the broadest outline of principles such as those suggested above, there is no certain formula for success. Each location and culture will present its own particular issues

and problems that require special attention. Some key questions to ask in strengthening or evaluating existing efforts, or designing new participatory natural resource management initiatives are outlined below²:

- To what extent have groups been identified within the community that could be effectively involved in the management of natural resources?
- As defined by the project, what constitutes community involvement in natural resource management?
- What benefits accrue to different members of local communities from their involvement within a meaningful time frame?
- How do the communities themselves view natural resource management?
- What 'bundle of rights' exists on particular resources?
- What government legislation exists regarding natural resource management, and how does this affect community access?
- In what ways do projects or conservation authorities constrain community involvement in natural resource management?

Conclusion

Through the use of three case studies this paper has shown that, in seeking solutions to resource use problems, there is need for initiatives that build on the viability and utility of local knowledge and traditional management systems. Past experience has shown that the keys to successful support of local institutions includes participatory approaches and genuine proprietorship over the natural resources concerned. The challenge remains to apply these principles in the field and tailoring support in a way that will improve the prospects of sustainable development.

Notes

¹ These lessons and problems have been identified by Charles Lane and Richard Moorehead at IIED in their recent work on community conservation projects.

² Charles Lane (IIED) identified these questions for his work on community conservation projects.

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LISTENING TO THE PEOPLE**SOME REFLECTIONS ON THE USE OF INDIGENOUS KNOWLEDGE IN
STRATEGIES TO CURB ENVIRONMENTAL DEGRADATION****Sabine Häusler****Institute of Social Studies****The Hague, Netherlands****Introduction**

First of all I would like to stress that I have no personal experience in dryland management. My experience on participatory resource management stems from working as a forester in Community Forestry projects in the Hills of Nepal for four years (Häusler, 1993) and more recently from development studies and research on the theoretical interconnections between women, the environment and sustainable development (Braidotti, et al., 1994). I would like to contribute to this workshop some reflections about work in progress on the interconnections between power and knowledge and the use of indigenous knowledge in improving environmental management within the context of development.

Experiences derived from the practice of environmental management over the last decades have shown that it is imperative to heed people's aspirations, knowledge and social organisation for sound local management of natural resources. The provisions laid out in chapter 12 of Agenda 21 for people's participation in strategies to combat desertification, the respect for indigenous knowledge, organisation and technology and a bottom-up approach are laudable. However, I will argue that if the International Convention on Desertification is to

take people's input and the respect for local knowledges, organisation and technology seriously, international, regional and national institutions have to undergo significant internal changes. They will have to move away from a top-down towards a responsive approach to environmental management which can account for the great variety, complexity, and heterogeneity of local arrangements of natural resource use.

In order to arrive at sustainable natural resource management there is a need for policy makers to look for a new type of development co-operation which provides space for non-western cultures and alternative conceptions of development, aspirations and priorities of the local land managers on their own terms. Otherwise, the move to take into account indigenous knowledge will only amount to a reification of the present state of environmental management- spruced up with bits and pieces of information from local, non-western cultures.

At issue for sustainability are relationships of power at all levels, bargaining power of different actors and different forms of knowledge. Longterm sustainable management of natural resources will be hardly possible if the connections between knowledge and power are not considered. What is needed is a politically sensitive way to bring together western scientific and indigenous types of knowledge in a process of negotiation of the social actors involved in development intervention. Western development experts and their Western-trained counterparts in the South have to learn to become sensible towards their own biases and critically re-assess their roles as both products of and vehicles for Western power/knowledge. They must be aware of the profoundly political nature of their work, even though they may see themselves 'just' as technicians.

Development and Environmental Management - Western Discourses of Power

In his writings on power Michel Foucault (1980) has developed a new understanding about the nature of power: far from seeing it as something somebody has and others don't, he describes networks of power relations which permeate societies. The locus of power is not the state; the nature of power is always relational, omnipresent and activated in instances where bargaining processes take place. Foucault pointed out the intimate connections between power and what is accounted the status of truth in modern western societies. Such "truth" is produced in and disseminated from large modern institutions, in our case the institution of international development. What he sees as most problematic about western discourses is that the centres of power and the centres of truth are identical. More often than not Western scientific enquiry is closely bound up with certain vested interests (via funding mechanisms), mostly economic or military. Furthermore, science via its claims to absolute 'truths' plays an important role in what is socially accorded the status of 'truth' and hence shapes the way we think and act.

In recent years a growing body of theory has been dismantling the claims of Western science to value neutrality, objectivity and universal validity (see for example Haraway, 1991; Shiva, 1988). Within Foucault's framework, power and knowledge meet and are articulated over time into specific discourses. The development discourse that has taken shape over the last four decades is intimately linked with privileged subjects as enunciators, institutions, techniques, policies, and certain practices in the form of development programmes and projects.

In analyzing a particular discourse we need to ask questions such as: What is argued?

By whom? In whose interest? Who is included/excluded from it? In the case of the development discourse it is development experts and scientists who have over the last four decades devised the solutions to the problems of developing countries based on scientific theories and practices developed in western countries. 'Development', a complex set of interrelated processes, has been split up into separate disciplines and technical problems for which technical solutions have been devised by Western experts whose activities have significantly contributed to giving shape to the 'Third World' as backward and underdeveloped, in need of reform. Western control and primacy over the directions of political, economic and social change of the ex-colonies have thus been maintained uninterrupted.

Development as propagated by the industrialised countries of the North to the South has been a process of westernisation, centralisation, normalisation and standardisation of modes of production, forms of government and other organisations, legal frameworks, etc. Development intervention has promoted certain normative (Western) standards of what development is and what it entails. Intervention practice aimed at the control of patterns of local economic and political development has resulted in fundamental changes like increased commoditization and institutionalization. These have been vehicles of development which have heightened confrontations between different interests and values (Long and van der Ploeg, cited after Long and Long, 1992).

At the core of this process lies a universalist economic framework of development with an instrumental conception of the human/nature relation, the ideal of urban life styles with high levels of consumption and an image of human agency as *homo economicus*. The universal introduction of the Western industrial, export-led, economic growth model of

development, despite some positive changes, has caused considerable damage to local lifestyles, cultures and- very visibly- to the environment.

The Colonial 'Classic' Approach to Soil Erosion and Conservation

The origins of the prevailing approach to environmental management within the development context goes back to colonial times. The colonial 'classic' approach to soil erosion and conservation consisted of four elements:

1. The problem was defined as an environmental one. Social and political reasons for soil erosion were excluded. If necessary, colonial soil conservation programmes were implemented by force: the colonial state 'protected' the environment from the 'destructive' practices of the local farmer.
2. Local mismanagement of the environment was seen as being based on lack of knowledge of the farmer, on his laziness, ignorance and apathy. Hence, the farmers needed to be educated; in particular the practice of shifting cultivation was stigmatized as a major evil. White settlers' practices were labelled as 'using the land', whereas black farmers 'destroyed the land'.
3. Overpopulation was seen as a major cause for soil erosion. Hence, population programmes were part and parcel of all soil conservation programmes already during colonial times.
4. Pastoralists and local cultivators were seen as poor because they were not sufficiently involved in the market economy. Modern methods of mechanized agriculture were

propagated as the answer to both bring in cash income and to reduce the need for children as labourers.

The practical effect of this colonial soil conservation discourse was a legitimization for the colonial powers to extract maximum agricultural and forest produce from the colonies for their own benefit. Even though the developmental nation state replaced the colonial administrations, the new national bureaucracies often just took over the development of their countries in the colonialists' fashion, advised by Western development experts. The introduction of 'development' and some time later 'economic development' to the Southern countries after independence has wrought considerable destruction to local lifestyles and environments.

In the case of forest management scientifically trained foresters, both Western, and increasingly after the widespread introduction of Western forestry education also national, took over the management of national forests. In many countries forests were nationalized after independence to ensure scientific forest management. Forest management was geared at timber production for global markets which in turn would produce revenues for national development. The forest ministries and departments 'protected' the forests from local people's 'destructive' practices. In effect, control over the use of natural resource was transferred from the local to the national level.

The development discourse of recent years largely excludes the processes that have led to environmental degradation in the South. These may be summarized as the introduction industrial, export-led growth policies, cash crop production at the cost of production for local subsistence, deteriorating terms of trade for the southern countries, currency exchange rate

mechanisms, debt services and austerity measures under Structural Adjustment Programmes, the role of transnational timber and other corporations, lack of effective land reforms, and large scale corruption by national and local elites. As mentioned above, in many cases the introduction of scientific forest management by a national forest service itself has in some cases exacerbated the problems of deforestation. A confrontation between national and local levels over the use of the forest resource was created, local people lost the previously held control over the local forests. Their traditional 'indigenous' forest management practices became in effect illegal.

In summary, the conventional technical environmental management approach may be broadly characterized by the following elements: it is a-historical in its analysis of the problem of environmental degradation, deals only with its symptoms, places the environment before local people, penalizes these people for actions resulting from 'their own poverty', maintains the facade of technical objectivity, and upholds the belief that the Western development model is in the best interest of the country. At the level of political economy it proposes no change (Baker, 1981). As Redclift (1993:37) has pointed out, the confused and limited way in which environmental problems are often understood hampers their solution. In place of a central concern with sustainability, across the full range of policy, most governments offer only a series of uncoordinated reactive policies. This approach usually matches laudable intentions with contradictory policy implications at the sectoral level.

During the last decades the development discourse has undergone significant changes; with increasing involvement in the practice of environmental management much has been learnt by development experts like foresters, agriculturalists, water engineers, etc. about the management of natural resources in the development context. The need to 'listen to the

people' (Chambers 1983) and for bottom-up approaches to development have been widely recognized for quite some time. Within forestry professional circles much effort has gone into the development of an approach away from purely technical, timber-oriented strategies to people's need- oriented social/community forestry strategies. The growing input of rural sociologists and anthropologists as well as gender specialists into forestry work was crucial for bringing out certain underlying assumptions and biases about the needs of target populations as assumed by Western and Western trained foresters. Foresters have recognized the existence of indigenous forest management regimes and the importance of considering them in the implementation of community forestry work. However, these recognitions are only slowly implemented into practice.

Most recently, there has been a growing recognition of quite sophisticated indigenous knowledge systems applied by local people in managing natural resources. This has been a positive move to value indigenous, previously subjugated knowledges and practices. However, as I will argue below, the use of indigenous knowledge within the developmentalist framework is not without problems.

In the case of the Community Forestry Development Project of the government of Nepal a lot of dedicated expert advice, critical thinking, training of staff, institutional build-up, new legal instruments and other provisions have led to improvements during the last two decades. However, the experience in Nepal has shown that even the most sophisticated, integrated, user-group oriented community forestry schemes have not produced the results hoped for. In essence, the reason for this is that despite the fact that serious effort has been put into a more participatory, user group-oriented approach to local forest management, full responsibility for the management of local forests has only reluctantly been handed over to

the local users, in most cases, control ultimately remained with the forest department.

Standardised institutional arrangements have been imposed onto highly variable and complex local situations in which informal local organisations have previously existed. Institutional requirements of outside institutions with their bureaucratic procedures and target-orientation have taken primacy over the flexibility and responsiveness needed to give space to local conditions and informal institutional arrangements. In many cases, parallel structures to the very informal existing local organisations have been set up by the forest department.

The main problem is that local people are enlisted to 'participate' in projects and programmes steered and controlled by outside experts and institutions with inherently different perspectives of the problems and solutions to these. Lack of faith by professional foresters in the capacity of local groups to responsibly manage local resources has ultimately led to poor performance with the result that efforts to design and plan projects 'on behalf' of the communities were more or less as much rejected by the latter as earlier, purely top-down approaches.

Different Approaches to the Use of Indigenous Knowledge Systems in Curbing Environmental Degradation

The most widespread approach to the use of indigenous knowledge applied by natural scientists, anthropologists and development experts takes certain elements of local/indigenous knowledge and incorporates these into the body of Western expert knowledge. Such knowledge is collected, taken out of context, incorporated into western scientific knowledge

and then disseminated to a wider audience of farmers/local people in a wider geographic context. Even though it may yield important new technical facts, this approach simply reifies existing power relations and the primacy of Western expert knowledge within the developmentalist framework.

The discovery of the rich body of indigenous knowledges must be seen as a positive move because it stems from a closer look at things 'as they are' at the local level. The usual approach of development- and government agencies is to design programmes and projects in their offices with needs and goals defined from the top and more or less disregard the actual situation. 'People's participation' usually begins, -not at the design stage, but when the plans are implemented into practice.

Indigenous knowledge is highly location-specific and based on close observation over long periods of time. It is embedded in culturally based value systems, systems of production and consumption and ways of living and relating to the natural environment. These dimensions of indigenous knowledge systems are usually disregarded when indigenous knowledge is put to use in environmental management.

Indigenous forest management systems, where they exist, are usually highly location specific with (mostly conservative) harvesting regimes. The use of wood and a host of other products is suited to local needs as they arise and not based on Western, standardised harvesting procedures. The local groups managing the forest are often based on informal and flexible neighbourhood arrangements. Therefore it is very difficult to incorporate them as such into government structures which would require formalization, standardization, scientific forest management procedures and legalization.

The second approach that I discern is the 'knowledge systems view' (Marglin in Apffel Marglin and Marglin, 1990). Two types of knowledge - Western scientific and indigenous - are distinguished on the basis of their characteristics:

- Indigenous knowledge is seen as *TECHNE* which based on experience, it is personal, particular, intuitive, implicit, indecomposable and orally transmitted.
- Western scientific knowledge seen as *EPISTEME* is analytical, impersonal, universal, cerebral, logically deduced from self-evident first principles and transmitted in written form.

This distinction is conceptually useful because it clearly points to the shortcoming of the developmentalist approach described above:

"The expert recognizes the *techne* of the farmer..... and is happy to learn from the farmer. In return, the expert is more than willing to teach the farmer, to give back in epistemic reworking that which he has elaborated on the basis of the farmer's *techne*. But this is exactly where the trouble begins. The expert can translate back only what he can translate from the farmer's *techne* into his own *episteme*. ...Translation is always partial and something is invariably lost. What cannot be translated ceases to exist, or exists only as a residue of superstition, ignorance or belief...'Dialogue' becomes appropriation, reduction, and loss" (Marglin, 1991).

The systems of knowledge approach presents the nature of indigenous knowledge in a more differentiated manner than the approach described above. It validates the relevance of non-western cultures and their respective knowledge systems holistically and at the same time recognizes the problem of appropriation of it by Western scientists. (N.B. also in

Western and Eastern highly industrialised countries there is a vast store of indigenous knowledges (see Banuri and Appfel Marglin, 1993)). This approach has produced some very informative comparisons and revealing accounts of the interaction between Western scientific and indigenous knowledges (Appfel-Marglin and Marglin, 1990). But conceptually, the two knowledge systems tend to be seen in a dualistic and somewhat oppositional relationship.

The 'knowledge systems view' shares the dualistic notion of Western and indigenous knowledge with social activists like Vandana Shiva of India (Shiva, 1989). Calls are issued by many southern activists for building alternative development strategies solely upon local forms of organisation, resources and knowledge outside of institutions like nation states, Western development agencies and transnational corporations . However, in today's world of global markets and economic relations, and large numbers of people living in urban environments, such visions - even though laudable - seem hardly feasible. As Ashis Nandy (1987) has so aptly pointed out, the choice today is no longer between traditionalism and modernity in their pure forms but an enlightened middle way between the two.

Maintaining a strictly dualistic understanding of Western scientific and indigenous knowledges may in practice lead to a revival of populist strategies and a simple reversal of the hierarchy of scientific over indigenous knowledge.

The third approach I want to present here is Norman Long's actor-oriented approach which sees the issue from yet another perspective. The essence of his approach is that its concepts are grounded in the everyday life experiences and understandings of men and women, be they Western development experts, poor peasants in Africa, local government bureaucrats or researchers. His aim is a more thorough treatment of social change and

development intervention which provides accounts for life-worlds, strategies and rationalities of different actors in different social arenas- on an equal footing. The objective is an elucidation of the actors' own interpretations and strategies and how these interlock through processes of negotiation and accommodation. This entails recognizing the existence of multiple realities and diverse social practices applied by the actors.

Long refrains from making a dualistic distinction between Western scientific and indigenous knowledge. He asserts that the production and transformation of knowledge does not lie in classification *per se* but rather in the processes by which social actors interact, negotiate and accommodate to each others' life-worlds leading either to reinforcement of existing types of knowledge or to the emergence of new forms (Long in Long and Long, 1992). In his view simple dichotomous distinctions between knowledge systems do not, for example, account for the creativity and experimentation by farmers and their ability to absorb and rework outside ideas. For him knowledge emerges as a product of the interaction between different actors. These processes and their outcomes are shaped to a certain extent by sources of power, authority and legitimation available to the different actors involved.

Long aims at developing a methodology for handling the complex set of relations evolving in interface situations of development intervention that would allow for a more differentiated understanding of how bodies of knowledge shape struggles and negotiations between local groups and intervening parties. Here, intervention is not seen as a linear process of implementing a plan of action, but rather as an ongoing transformation process by which knowledge is negotiated and jointly created through social encounters in which certain power dynamics are operating. Intervention is continuously modified by the negotiations and strategies that emerge between the various parties involved. Important is the

attempt to understand not only the power struggles between 'outsiders' and 'locals', but also the working of local power structures. Interestingly, the researcher who investigates these processes him/herself and his/her objectives and life-world are an intrinsic part of such studies.

For Long development discourse and action involve a struggle over images of development and 'the good society'. Particular types of intervention must be placed within a broader sociological and historical framework of analysis that identifies the crucial actors, interests, resources, discourses and struggles that are entailed. Planned intervention must then be deconstructed in order to get away theoretically from existing orthodoxies and simplifications concerning the nature and tendencies of structural change. This would lead to a reconceptualization of development intervention as a complex process involving the articulation and re-shaping of different life-worlds and understandings of actors.

Long adds to our understanding that all knowledge is partial and based on a particular perspective. Long abandons dualistic distinctions between Western and non-Western knowledges, thus implying an equal validation of different forms of knowledge. This position opens up the perspective for sustainable environmental management as a process of negotiation between actors with different worldviews, interests, resources and power on international, national and local levels. This would imply an actor-oriented approach to environmental management with new institutions acting as facilitators in negotiations and conflict resolution between all groups of actors involved.

Concluding Remark

A more differentiated approach to the study of indigenous knowledge systems may help us to refrain from simplistic notions of using indigenous knowledges as a new panacea or the latest fad in development practice, while distracting attention from more fundamental changes necessary for the implementation of sustainable environmental management globally. The effect of this would be a legitimization of 'more of the same' with slight improvements. Fundamental changes in power relations between local, national and international actors are inevitable for any meaningful changes towards the sustainable use of environmental resources in an intimately inter-connected global environment. What is at stake is a fundamental questioning of the Western development model itself, and the ways different groups of people dominate each other and the natural environment. Most important of all, a sensitive approach to the interaction between indigenous and Western scientific knowledge about the use of the natural environment has the potential to open up a space for fundamental questioning, negotiations and re-definitions of what 'development' is and what it entails. This is -in essence- an ethical question.

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**NATIVE EXPERIENCE IN PANAMA FOR THE TRADITIONAL USE AND
PROTECTION OF FORESTS AND OTHER NATURAL RESOURCES**

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Introduction

For indigenous people, the earth is intimately connected with their indigenous cultures and it is symbolized as "Mother" because it offers its inhabitants all of the resources necessary for their existence and survival. Mother Earth provides forests, rivers, and a diverse range of flora and fauna, many of which are useful for medical or technological purposes, contributing to a better quality of life. For this reason, indigenous people feel a tremendous respect for their Mother Earth, and they try to live harmoniously with nature as an intrinsic part of their being.

After five centuries of lies from Western cultures, combined with the imposition of foreign ideas, our concepts and viewpoints about the true significance of the richness of earth's natural resources went through a process of change. During this long historical process, the belief was formed that these gifts from Mother Earth were unlimited. Indigenous people were also led to believe that they were an impediment to the development of civilization, and an obstacle to the activities of economic advancement of a country. At the base of this development concept, there came the introduction of inappropriate technologies that irresponsibly exploited the land and marine resources, damaging the Mother

Earth, as well as plundering indigenous peoples' territories. If we, the indigenous people, have resisted and survived in these tropical jungles up until the dawning of today, this is due to our relationship with and respect for Mother Earth. Nevertheless, when the conservation of nature and its diverseness is debated, the territorial rights of indigenous people are often forgotten, or if they are recognized they are treated as a ghost, considered a secondary priority.

The deterioration of our Mother Earth is equivalent to the crisis of global cultural diversity. Indigenous peoples live in areas of high biodiversity, and they are confronted as well by many threats against their territorial, cultural and spiritual possessions, and in some areas their very lives are threatened. This long experience with nature and outside exploitation has been interpreted by and incorporated into our social, economic and political systems, in order to define the territorial limits of our natural resources, and to assure our existence and future development of new generations of indigenous peoples.

Indigenous people of Panama

Panama is a narrow natural viaduct that unites North, Central and South America. Because of its geographic position in tropical latitudes, it has developed throughout its evolution a great biological diversity, both terrestrial and marine. For this reason, this has promoted the development of diverse indigenous cultures in the region, enjoying the local natural resources.

In Panama, approximately 55,000 hectares of tropical rain forests are destroyed each year, and it is no coincidence that the principal zones of tropical forests that remain in the

country are occupied by indigenous peoples, who need it in order to survive. For example, in the Talamanca mountain range in the province of Bocas del Toro live the indigenous groups Bribri (with 500 inhabitants) and the Teribes with 2,200 inhabitants. In the central mountain ranges in the provinces of Chiriqui, Veraguas and Coclé live 120,000 Guayamies, divided into two groups with linguistic differences, the Bugleres and the Ngoberes.

In the Northeast of Panama live the Kunas, who are located in three different jungle zones: the indigenous territory of Kuna Yala, a mountainous coastal region on the Pacific coast, in the highlands of Bayano and in the area of Darien. The Kunas have a population of approximately 48,000. In the Darien region two related indigenous nations also live: the Emberá, with 15,000 inhabitants, and the Wounaan, with 3,000 inhabitants.

Traditional Kuna experience on the use and management of natural resources

We Kunas are originally from the high mountainous region of Darien. However, during the era of the "conquista" and colonization, our forefathers were persecuted by the Spaniards, and they were slowly displaced. Over time they situated themselves throughout the islands on the Caribbean coast of Panama, along the coastal regions, and some small groups situated themselves in the highlands of Bayano, in Darien, and in the Department of Antioquia, Colombia, each community having its own socio-political and administrative structures.

The Kuna people interpret the use and management of natural resources through religious songs, ritual ceremonies, dances, restrictions (usually food-related), among other traditions, and if the rules and norms are not followed, this is believed to provoke illness and death, and in this way return the energy to nature, as a way of re-establishing the

equilibrium. The preservation of natural resources is a basic and extremely important issue for the Kuna people, because in our cultural tradition, nature exists in communion with human beings. When our children are born we bury their umbilical cords in the earth, and in this way it can be said that a tree has been planted.

In terms of the mythical-religious conception of Kuna history, a legend recounts of the first Kuna being to descend onto the earth: "I arrived on Mother Earth. I was received by many brothers-- one of them was the air... this brother did not want for me to sweat, and so he brought me a great fan to refresh me. Another brother offered me fish, lobster, turtles, etc., and this brother is the sea. Another said to me: 'I see that you're dirty, and I want to clean you'; this brother was water. Still another said to me: 'look at the mountains, the forests..' this is the sun. I am '*el hombre de Igua Uala*' (the man of the Almond tree)."

Within this mythical-religious conception is embodied the way in which the Kuna people think about natural resources found within their territories. Our great *Neles* (people with a special capacity for communicating with extrasensory spirits) have been orally transmitting from generation to generation our respect for nature and her protection. These natural areas contain a great biodiversity of species of plants and animals. Many of them are used as food, in the construction of our homes, as medicine, and in the making of clothing, among other uses.

We Kunas call these natural safe-havens for wild plant and animal life *Kalu* (Kunas imagine this as a community well guarded with poisoned arrows). The *Kalus* are seen as sacred places, inhabited by a group of natural species that are facing the threat of extinction, like the Harpira Eagle, the Saína and the Macho del Monte (two types of wild pig), the

panther, and others. There are many of these sacred places in our Kuna territories, each designated for the conservation of certain species, examples being Sigli Ibegun Kalu for great turkeys (*Crax rubra*), Putu Ibegun Kalu for the preservation of certain smaller birds (Perdiz de Arca), and Sur Ibegun Kalu, for the preservation of certain monkeys.

Visits that have not been approved by the supreme chief are not permitted in these protected areas. Everyone obeys this rule, because these areas contain very fragile life forms, the destruction of which might unleash disastrous repercussions such as epidemics. In order to be able to enter one of these zones, one must consult with a *Neles*, after which a ceremony can be prepared during which a pact is made with the chief of the Kalu. In these natural reserves protected by the Kuna culture, all types of hunting and logging and other exploitation are totally prohibited, as these activities would disturb the tranquility of the species which live within their boundaries.

In the same way, the natural resources of the sea of Kuna Yala are preserved in a sustainable and pragmatic way; for example, when turtles nest, only one tenth of their eggs are allowed to be gathered, and the rest are left for reproduction. Also, it is prohibited to eat turtle meat, and the children are told that in the beginning of creation the turtles were people, and if they were to eat their meat they would be eating human meat. There are several marine and land animals which the Kunas are prohibited to eat. This is one way of instilling in the new generations the idea that they should know how to preserve and protect their land and sea resources for tomorrow.

Kuna systems of agricultural production

Indigenous systems of forest use and management involve the combination of four principal activities: agriculture, fishing, hunting and gathering. Cultivated indigenous areas are characterized by their multi-leveled vegetation which impedes erosion and the loss of top soil due to heavy rains and high temperatures of the tropical rain forests. Another of their characteristics is the diversity of the appropriate distribution of crops which discourages dangerous pests and diseases. Furthermore, many farmers plant their crops taking into consideration the soil conditions and the needs of the particular species they are planting.

In the beginning the Kuna people practiced a production system called *nainu*, meaning parcel farming, which consists of taking advantage of parcels of land which are in their "resting" phase, for the growing of certain specifically defined crops. This practice takes place after the annual cultivation cycle. In its most traditional form, these practices are integrated with the cultural and socio-economic life of our people.

The Kuna concept of land and territory

Kunas do not consider themselves owners of the land, nor of the ecosystems or their resources. Rather, the Kunas consider that life is intimately linked with nature, and that it cannot be exploited for individual benefit. On the contrary, Kunas believe that natural resources should be used for collective or community benefit, conserving them for future generations. For indigenous people it is inconceivable to imagine a separation with the "under water world", and in practice they have seen the serious and irreversible damages that aquatic over-exploitation and contamination have caused. Because of this, underground natural

resources in Kuna territories are seen as the "Natural State Inheritance", but the national government does not want to let go of them. Because of this absurd situations have arisen; for example the recognition of Kuna peoples' rights to territory, but not to the underground natural resources (i.e. minerals) that exist within these territories. In this way the Kuna are in effect lords (owners) of a ghost.

In the last few decades, logging and mining activities have come to be the center of conflict between the State of Panama and the indigenous nations that live within its borders. Legal statutes do not recognize the rights of indigenous people to their underground resources. The national government has not yet recognized that Panama is a multi-cultural and multi-lingual country, and that indigenous people have the right to demand legal control of their territories and of their underground resources, so that they can assure their preservation, sustainability and the regeneration of the ecosystems.

**DEPARTURE POINTS: RESEARCHERS, RURAL COMMUNITIES
AND THE TRANSFER OF TECHNOLOGY**

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Introduction

A little over ten years ago, Canada's International Development Research Centre (IDRC) provided support for the first phase of a project to develop technologies for arid and semi-arid farming in eastern Africa. The project had all the elements for success: a multidisciplinary team of committed national researchers (foresters, agronomists, economists), the participation and technical skills of international scientists, and adequate donor funding locally controlled. The project has entered its third and likely its final phase and provides a useful study of the concept of **technology transfer**.

Farms in the project area vary in size from a few to several hectares; most are divided into croplands, grazing lands and home compounds. Some farmers own or lease draught oxen for cultivation; some raise cattle and most keep goats and poultry. The principal food crops are maize, beans, pigeonpeas and cowpeas. Most household heads are men while women do the farming with the assistance of their children when not at school.

Many farms have a high proportion of sloping land and their soils are generally infertile and often badly eroded. Annual rainfalls are less than 600 mm and unreliable.

There is a long, hot dry period of several months. Farming under such conditions, to say the least, is a risky occupation.

The overall objective of the project as agreed by the researchers and the donor agency and set out in official documents was:

"to develop acceptable agroforestry technologies to improve the quality of life of resource-poor farmers".

Based on an initial survey of the area, the researchers found that the problems associated with dryland farming were: soil erosion, poor soil fertility, and shortages of fodder, particularly at the end of the dry season. The low rainfalls and labour scarcities were considered to be the major constraints to increasing farm production.

A number of specific objectives which could be achieved in the short-term were proposed. These included studies to evaluate hedgerow intercropping (alley cropping) to improve crop production, species trials for live fences and for fodder and fuelwood production, and the development of a "technological package" to rehabilitate degraded grazing lands. For the first couple of years, in order to control inputs and obtain quantitative data, work was carried out on the research station and on small, well-fenced plots on land provided by farmers. A number of trials were established, some managed by the researchers, others with farmer support.

There have been a number of technical achievements over the past decade. Several tree species for alley cropping have been identified which can adapt to arid conditions.

Biomass production, however, tends to be low with wide variations and higher from station trials than from farm trials. The hedgerows also appear to take up a considerable amount of space in the cropland much to the concern of farmers, and roots and branches sometimes interfere with ploughing operations. Some farmers also complain about the labour required to manage the system.

Other species show potential for use as live fences and fodder banks. However, a major constraint is the labour required for the establishment and protection of the seedlings. Fodder banks also require labour to cut-and-carry branches for livestock feeding. Live fences appear to have limited value without good farmer management to replace missing plants and pruning to increase branchiness.

For eroded grazing lands, the project team has developed a full rehabilitation package on plots provided by two farmers. The main components include site protection by fencing, the use of micro catchments and pruning to promote faster growth of indigenous trees, ditch construction for erosion control, and the introduction of fodder grasses and tree species. Improvements are clearly visible today and these plots serve as a demonstration to neighbouring farmers. Unfortunately, no farmers have yet adopted these practices, possibly because of the labour required but also perhaps because much of the land to be rehabilitated is communal land and not privately owned. Furthermore, it is now recognized that management efforts are intensive for land which is considered to be low in productivity, ie; the return to labour is low.

In spite of working closely with a few self-motivated farmers, and in recent years with women groups and primary schools, widespread community adoption of the agroforestry

technologies has not taken place, much to the frustration of the researchers and to the donor agency. The project can best be described, like others of its type, as one of "limited success". To be fair, the exercise has been a learning experience to all involved, but it seems to have little to show for so much time and effort. A further indignity was an in-house consultancy report in 1992 which questioned "the lack of saliency of the agroforestry technologies being offered for adoption".

Hindsight, always useful, suggests basic issues which require attention. An important factor, unrecognized or not understood, by the researchers, is the different "points of departure" between the farmers and themselves, best explained by Chambers' (1983) concept of "cores-and-peripheries".

At the core or centre of the relationship between researchers and farmers are the researchers - knowledgeable, educated, in control, and relatively well-off. Most return to urban settings in the evenings. Some, born in rural areas, have been fortunate to escape rural hardship; many have never been farmers, especially subsistence farmers. Researchers have information and access to resources and powerful individuals.

Figure 1.

Away from the core, on the peripheries of decision-making, are the majority of farmers, with less formal knowledge and power. By definition, they are rural and the more marginal their land, the more vulnerable they are and the greater their poverty. According to Chambers (1983), professional conditioning and training has conditioned the way we see things. Outsiders, non-rural dwellers, whether Third World researchers or First World donor agents, decide on what to do and where to do it.

Recognizing and understanding the different points of departure between rural people and researchers should be a critical first step in project design. It seems obvious but development practitioners need to know what, if anything, rural people want, what their goals and objectives are, and how they make a living - to develop what Diane Rocheleau has called a **user perspective**, in other words, to attempt to see the issues through the eyes of the farmers (Rocheleau, 1987). This requires continued examination of assumptions on the part of the researcher, and a fundamental reversal of attitude and perspective.

As an example, the overall objective of this project, "to develop acceptable agroforestry technologies to improve the quality of life of resource-poor farmers" should be turned on its head to put the people first and becomes:

to work with a specific group of people, poor rural men and women, to help them gain for themselves and their families more of what they want and need through an understanding of the ways in which they make a living

Not perfect nor complete but a beginning. The focus of attention is on the people, not on the technology. The main objective is to enable people to gain control over their own

lives through active participation in their own development. Unfortunately, very few of us are taught at university how to "empower" rural people, how to find out and understand what their real priorities and problems are, and how to help them explore and develop their potential.

Another early step should have been to recognize the different biophysical and socio-economic conditions, the "departure points", of researchers and small-scale farmers. Research on research stations is under controlled conditions, on flat land and on fertile soils and usually with unlimited access to water, pesticides, capital equipment and information (Chambers and Jiggins, 1987). Station experiments if carried out by competent researchers rarely operate under conditions of risk and uncertainty due to weather, insects, disease or market fluctuations. (1)

Farmers work under different conditions. And therefore the results and observations of different technologies used on research stations and on farmers fields can be significantly different. In an economic analysis of an alley cropping experiment in West Africa, Arnold (1987) found that maize intercropping gave the highest yields and returns to labour over monocropping but that these results were from on-station trials and might not be the same under farmer-controlled conditions.

Subsistence farmers generally have little control over the conditions they operate under, making the best out of what they have. Their lands, compared to those of the research station, are less flat, less fertile, and with little or no irrigation. They have less access to inputs such as credit, fertilizers and pesticides, draught power, improved seeds and information. Most farmers have no influence on market prices, training programmes and (2)

government policies. Most importantly, they do not operate in isolation but under constantly changing social and economic conditions.

Chambers (1988) refers to this type of farming as "complex, diverse and risk-prone" or **CDR farming**, complex in activities, diverse in environments, and one where risk reduction is a major preoccupation. Farmers usually depend entirely on family members for labour, and they may own, rent and/or share all or portions of the land they work. Many struggle to meet both consumption and production goals.

If this difference between researchers and farmers were not enough, it has been noted that farmers do not "just farm". The raising of crops and animals may not be the most important activity of the family. Income generation is an important objective, income which is often earned from non-farming activities and from off-farm employment (Arnold, 1987). Some of the contact "farmers" involved in this IDRC-funded agroforestry project were school teachers, one owned a small kiosk, and another worked for the government. An important limitation to projects and programmes designed to "improve" the circumstances of small-scale farmers is to underestimate the importance of non-farming activities. In East and Southern Africa, additional family income may come from a variety of sources - the making of handicrafts, brewing of beer, trading in local markets, teaching, and wage employment - all of which serve to reduce the time available for farming. Zinyama (1988) found that shortages of family labour on communal farmlands in Zimbabwe was a major constraint to increasing crop production. Many men were away working in urban areas or on large commercial farms, and their wives, the actual "farmers", had social and family commitments in addition to farming.

Developing and promoting technologies directed only at "farming" may therefore often prove futile, and have little to do with the quality of the technology. For people involved in a variety of activities to improve their livelihoods, a strategy to support the diversification of rural economies, to increase the opportunities and options available to rural people, might be one worth considering.

It should come as no surprise that the priorities, objectives and needs of rural people can be quite different from those of researchers. A long overdue socio-economic survey of the rural community involved in the agroforestry project found that the farmers had three main criteria for judging the usefulness of the technologies promoted by the researchers. These were:

- * proof of rapid returns with minimal risk;
- * sufficient returns for the resources invested; and,
- * the extent and timing of the technologies' demand on scarce resources, especially labour.

This is not the first project or programme nor will it be the last to set off on the development track armed with faulty assumptions and pretensions of knowing what people need.

Strategies to tackle woodfuel scarcities provide some good examples. Wood for cooking, heating and lighting is a basic necessity for many African families. The overcutting of natural woodlands for firewood and/or charcoal production is often regarded as the first step in land degradation and eventual desertification. A two-pronged attack to increase

supply and to reduce demand was initiated by most national governments with the support of international donor agencies.

Supplies could be increased by establishing government-controlled fuelwood plantations, some of these on the outskirts of urban centres. It was assumed that the main produce of these plantations would be firewood and hence the poor would directly benefit. However, establishment and maintenance costs are generally high and firewood is either heavily subsidized or is too expensive to purchase. In many cases the plantations are allowed to grow beyond the firewood stage and the wood is then sold as higher value poles or sawlogs. More critically, the establishment of such plantations often changes the land from local use to one under state control, alienating land that was previously used for communal grazing and the collection of wild foods, firewood and building material. Government plantations thus frequently removed rather than created a valued local resource. Many such initiatives have had the opposite effect of what was intended and led to increased pressures on remaining woodlands (Ayling, 1992).

As these initiatives were questioned, strategists turned to village and communal woodlots. The term "community forestry" became a popular theme although few proponents understood the concept of "community" (Cernea, 1990). Nevertheless, it was believed that the required massive planting of fuelwood species could best be accomplished by involving large numbers of people. Communities were expected to mobilize their members to plant and collectively protect the young plantations, and to ensure the fair and equitable distribution of the benefits. However, as labour is invested, the wood has a higher value if markets are available and is unlikely to end up as firewood. Further, although natural woodlands may be used communally with minimum groups rules, the participants in communal woodlots can

become suspicious over the sharing of costs and benefits. There have been "limited successes", in spite of over USD 160 million spent on various community forestry programmes between 1975-1982 (Barrow, 1991). Money has not been a constraint.

At the same time, the demand for woodfuel could be reduced by developing more efficient woodstoves. Technically, the products of most stove programmes were excellent. They were more energy-efficient than the traditional three-stone fire and saved fuel and money. Many were made from locally-available materials such as clay or brick; some were portable and made of metal lined with clay. Most could be produced inexpensively by local craftsmen. However, according to Shepherd (1990), many stove programmes failed to have an impact. In some instances, the stoves were used inefficiently; their distribution was often limited, and in some cases, the stoves were relatively expensive. More importantly, although many were technically sound, many were simply culturally unacceptable. Researchers frequently underestimated the social importance of the traditional fire. Families involved in the pilot testing of "improved" stoves were often also using the more sociable open fire, especially for light and warmth. Researchers also failed to consider that in real life, whenever fuel is scarce or costs increase, people respond in a variety of ways to reduce consumption (Deeweese, 1989). For people of developing countries, this includes better fire tending and management, different ways to prepare food using less energy, the use of other fuels such as agricultural wastes, and when possible, more time spent collecting firewood. This should not be surprising. It is a universal response to scarcities South and North - using less more efficiently, using alternatives, changing lifestyles.

There are other examples of "limited success" technologies developed by outsiders although not many appear in the literature. Africa is littered with the carcasses of abandoned

quick fixes - neglected species trials, overmature communal woodlots, solar dryers, improved cookstoves, windpowered generators, testimony to good intentions gone bad.

The local situation in rural communities is complex and changing, with accelerated rates of change having direct effects on already fragile social systems and environments. It is therefore surprising, not to say arrogant, that many development workers think they have the right answers and easy solutions to these complex problems (Meyeroff, 1991). In many instances, they do not even have the right questions. Barrow (1991) suggests, for example, that almost all development interventions have not helped impoverished pastoralists because of an inadequate understanding of pastoralism. Pastoralists, if they survive, do so despite "development projects", not because of them.

Rural people are the experts in rural living and survival. They should be at the core of development but often have too little involvement in planning and design. Their first opportunity often comes when development workers show up on their doorstep, long after their collaboration has been taken for granted and research topics decided.

Poverty and ecological degradation are interrelated. Poor people do overexploit their resources out of necessity, sacrificing their future to survive the present. Ecological deterioration perpetuates poverty as degraded ecosystems offer diminishing returns (Durning, 1990). Efforts focusing on environmental degradation while ignoring the root causes of poverty will have mixed results. Simplistic explanations and solutions will have little positive effect. The popular theme of **technology transfer** is flawed, based on core beliefs and assumptions of what will work and on what is best for rural people. Successful aid, however, builds on locally-generated efforts to rehabilitate drylands. Development workers

have to make the effort to talk and to listen to rural people, to discover what their problems are and what solutions they think are possible. As Durning (1990) observes, "*for development to help the poor, it must put them first...true development does not simply provide for the needy, it enables them to provide for themselves*". Development must start and build on what people know. Only then will it be sustainable and result in self-reliance rather than dependency.

Fig. 2

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HELPING RAJASTHAN'S CAMEL PASTORALISTS SURVIVE
AND WHAT NGOS COULD DO ABOUT IT:
THE VIEW FROM THE BOTTOM

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The futility of top-down approaches when implementing dryland-management projects - or any grassroots level project - has gained widespread recognition. But are donor agencies and NGOs really able to change their ways and act in response to problems **as they are perceived by local populations** ? Experiences with setting up a project "at the request" of Raika camel pastoralists in Rajasthan, India, suggest that fundamental changes in the way developing agencies operate are necessary before a true "listening to the people" strategy can be adopted.

Introduction: The Macro-context

Rajasthan, India's most western state, encompasses a succession of arid, semi-arid, and sub-humid ecological zones in a west-eastward direction. The Thar desert that straddles India's border with Pakistan is often described as the world's most densely populated desert. This is certainly testimony to the wisdom of its inhabitants in making thrifty and efficient use of its resources. However, with a population growth rate considerably above the average for India -

the population of its arid districts has almost trebled since the beginning of the century - Rajasthan's ability to accommodate painlessly a further increase of its human and animal populations may be close to exhaustion. This is indicated by the bitter atmosphere that has developed between social groups whose economic activities once complemented each other. Peaceful coexistence is replaced by an increasingly belligerent struggle for land, or access to it, between agriculturalists and pastoralists and among animal herders belonging to different castes. In an unprecedented event nine shepherds belonging to the Raika caste lost their lives during the 1993 rainy season after being ambushed by over one thousand members of a different caste in a pasture conflict.

Rajasthan's predominant land use strategy until India's independence (1949) was sheep, camel and cattle pastoralism that relied on communally owned property resources, combined with opportunistic rain-fed cultivation of sorghum and pulses. In the 1950s a more equitable redistribution of the resources, held until then by feudal overlords, was carried out. In the course of these land reforms some previous pasture land was allotted for cultivation. Other developments, including the spread of irrigation agriculture, increased availability of tractors, shortening of the fallowing period, mining activities, and the creation of nature reserves, have also cut into the amount of land available for grazing (Jodha, 1988). Thus, between 1956 and 1987 common property resources decreased by 32%, while the net sown area increased from 28.6% in 1951 to 47% in 1981. Concurrent with human population growth, livestock populations have also risen, and the stocking density has trebled (Centre for Science and Environment, 1985). The effect of these developments on the plant biomass can best be illustrated by quoting Rajasthani villagers, who frequently make comments such as "earlier there used to be a jungle here, now there is nothing".

Rajasthan's pastoralists have found a solution to the lack of grazing in their home state by making seasonal moves into adjoining states - notably Madhya Pradesh, where uncultivated land is available, and Haryana, where the post-harvest stubble of irrigated fields can be exploited (Kavoori, n.d.). Largely because of these newly found outlets, substantial profits can still be made from sheep breeding in good years; therefore even members of the land owning castes have fairly recently taken to migratory livestock production. Yet, for the traditional pastoralists who own no land and depend entirely on common property resources, the situation is becoming more and more difficult (Köhler-Rollefson, 1992).

I think no disinterested onlooker would dispute the need to reverse the present trend of increasing animal numbers and the necessity of reaching a long-term equilibrium between available fodder resources and numbers of animals if irreversible damage to the ecosystem is to be prevented. In the words of an eminent local activist, Kishore Saint, "even though the comparison with the African Sahelian situation may not be strictly valid, there is no doubt that similar processes of degradation are at work in the subcontinent"¹. One would therefore expect that the situation of Rajasthani pastoralists would be an issue of prime concern to the large array of international donor-NGOs represented in India. Yet, as will be demonstrated, these donor-NGOs are in a poor position to tackle problems of such a nature because of bureaucratic constraints and the lack of articulation with the actual people.

Listening to the people

The Raika camel breeders.

About three years ago I embarked on an academic research project² with the mission to understand the Indian camel pastoral system, a subject about which very little was known and nothing had been written. Because the cultural and economic context of camel breeding is entirely different in India from other countries, the most salient features will be summarized here. In Rajasthan, camel breeding is the traditional domain of a particular caste called the Raikas or Rebaris. These are not nomads in the traditional sense, since they have permanent dwellings. They represent one of many specialized professions that compose the interdependent village caste community (Srivastava, 1991). Their camel breeding is not subsistence but market oriented. The Raikas have large herds of camels, but they do not exploit them for food. Killing or slaughtering camels for meat is an absolute taboo, and the milk is only used sporadically. The sole rationale of the system is to provide male camels for sale to rural and urban users. Camel-drawn carts are an indispensable component of Rajasthan's infrastructure, often the only source of communication and transportation in its remoter areas but also ubiquitous in the larger cities. They are also used for ploughing, threshing, lifting water, etc., and there is no doubt that they save India enormous sums of foreign currency that would have to be spent on fuel import if these tasks were carried out by machines. Hence the demand for camels is strong and there is no indication that it will abate in the near future. It is somewhat ironic that the traditional pastoralists producing these camels are in dire straits.

Encounter with a community in distress.

The Raikas have a reputation of being one of the most conservative groups in Rajasthan and as being extremely tight-lipped to outsiders, which poses a severe hindrance to data collection on camel pastoralism. I was lucky enough to enlist as interpreter the first member of this group who had trained as a veterinarian, and it was only due to this circumstance that I could get access to the community and start collecting data. In the course of our enquiries we learnt about a Raika *dhani* (settlement) at the foot of the Aravalli Hills that owned two or three thousand camels, all expected to congregate there at a certain spring holiday for their annual shearing. We went to the *dhani* on the particular date and indeed encountered a couple of thousand camels, as well as a community which was totally camel oriented, as evidenced by a collection of memorial stelae depicting camel-mounted ancestors and self-made clay camels the children played with. Not surprisingly, I was totally fascinated and felt myself in camel heaven.

Unfortunately, the enchantment was not mutual. While I was used by then to the not overtly welcoming demeanor of the Raikas, in this case they were almost openly rude. When I finally got my assistant to - very reluctantly - translate their comments, the message was "what is the good of this woman coming here, asking questions, and taking photographs ? We have a lot of problems and nobody is doing anything for us." Having been baited by this conversational gambit, we obviously felt compelled to enquire about the particular nature of their problems which only emerged after a lot of prodding. The Central Government had abruptly closed the traditional summer grazing grounds of these Raikas in the Aravalli Hills and the absence of alternative pasture opportunities had brought their herds to the brink of starvation. Probably because of this predisposing factor, their camels had also suffered an

especially severe outbreak of trypanosomiasis, that resulted in a massive spate of abortions. The medicines for the treatment of this disease were almost impossible to obtain and in any case too expensive. The people felt that they were facing economic ruin; they were desperate for veterinary medicines for their camels and permission to graze in the forests. Trying to wheedle detailed information out of them proved futile, beyond eliciting bitter complaints. But in order to gauge the extent of the problem, we needed at least a rough estimate of the number of their female breeding camels and the proportion of diseased animals. Only by making the unwise move of promising that we would bring their crisis to the attention of the appropriate authorities and try to find help for their veterinary problems, were we able to establish that around 50% of their pregnant camels had aborted.

My research assistant and I then proceeded to Delhi and presented the case to a selection of donor-NGOs, who were all sympathetic, thrilled to hear for the first time about camels, willing to help and even to part with considerable chunks of money, but... all their offers of support were tied to the existence of a registered voluntary organization fulfilling a number of bureaucratic requirements that they could channel their money through.

Since our remote village was not in the catchment area of an already existing voluntary organization, we had only two options: Either to abandon the effort or to engage in the rather paternalistic attempt of persuading our people of the need to organize themselves into a formal group according to the various bureaucratic requirements stipulated by donor-agencies.

To cut a long story short, after over two years of running back and forth between the

"target-community" and donor-NGOs, we still have not succeeded in establishing a link between them. We have not been able to fulfill the formal prerequisites that would enable our community to receive any kind of donor-NGO help and support. In regards to their concepts of what constitutes a worthwhile project and to forms and standards of social interaction, the worlds of the donor-NGOs and the people that need help are separated by a gulf so vast that "never the twain shall meet". I must add that not all the "fault" for this rests with the NGOs. The situation is to some extent self-inflicted by the Raikas who cry out for help, but whose lack in social skills - as perceived by outsiders to their community - make this difficult. We actually had two cases in which representatives from Delhi-based NGOs expressed the intention to visit the "project area", but there was nobody on the Raika side to answer their letters or receive them. One could put the blame for this at the feet of the Raikas and ask, as one hurried foreign NGO representative once did, "why help them, if they are like that?". Admittedly, in my more frustrated moments I am inclined to agree with him, but on the other hand, how can the Raikas be expected to immediately open up to outsiders who drive up in a taxi, don't speak their language, are absolutely ignorant about even the most basic aspects of their life and leave after a few hours of asking impertinent questions.

However, while we failed on the front of fulfilling the prerequisites for direct interaction between donor-NGOs and our people³, there have been other significant developments. The biggest one is that, against the odds, and although we never delivered on the promises that started the whole process, the relationship with the Raikas has markedly improved and people no longer doubt our intentions. Several small steps were successful in creating a positive atmosphere, and I no longer dread the moment I have to leave my vehicle

and face the village crowds. A major break-through was achieved by purchasing a camel and its subsequent placement in the care of the Raikas. The need to check up on the well-being of this animal provided a legitimate context for visits and enquiries that then were no longer regarded as snooping by an outsider.

The distribution of a limited quantity of medicines against trypanosomiasis, financed by a private fund-raising drive and, recently, the German Embassy in New Delhi, were major public relations coups, and at the same time we obtained information on herd sizes and rate of losses. In March of 1993 we organized an international workshop⁴ which brought together the various factions concerned with pastoral issues on an administrative, scientific, and development level. Also participating was a large contingent of Raikas who took the opportunity to present their demands vociferously. While no concrete recommendations emanated from this workshop, which frequently deteriorated into shouting matches, it succeeded in bringing the subject much more into the limelight and raised the level of awareness for the critical situation of pastoralists in the appropriate circles.

All this may seem hardly worth mentioning, but we feel the steps taken so far have now prepared the ground for successful interaction with the Raikas. Luckily, a newly established and dynamic research-oriented local NGO in Jodhpur, the School of Desert Sciences, has become very interested in the problem and, although located 200 kilometers from the village in question, it will act as the official implementing body for the project we are planning. This whole process has taken up an inordinate amount of time, but it also has given us a chance to reflect on interventions that could contribute to a **long-term** solution. It has dawned on us that the free provision of veterinary medicines as envisioned by the Raikas

is not going to achieve this and that more comprehensive measures are required.

The action plan

1. **Data-collection and liaison.** One of the most frustrating aspects of working with the Raikas is that they desperately want help, but at the same time are reticent to provide even the most basic bits of information. But no support project can be mounted without a solid data base and an identification of the bottlenecks in the present camel production system. The Raikas therefore have to be persuaded to cooperate on this level. We think that they will change their attitude if they realize that backing up their complaints with accurate figures on the amount of losses or numbers of abortions their camels have suffered will put them into a much stronger position vis-à-vis government agencies. We have had surprisingly good success with employing a young literate Raika from a camel breeding family for the sole purpose of systematic data collection on aspects that are essential for outsiders to understand the Raika camel production system. He is doing this **at his own pace and according to his own judgement**, but has already accumulated an extensive body of data on kinship patterns, herd sizes, herd composition, migratory patterns and so forth.

Our hope is that he will eventually become the essential link between his community and the donor community, and grow into a liaison-person who is capable of presenting the worries and viewpoints of the Raikas to outside agencies. For this reason we are also financing his English studies and gently familiarizing him with the NGO scene.

2. **Camel Husbandry Improvement Project ("CHIP")**. I mentioned in the beginning that in Rajasthan there is no leeway for further expansion of livestock numbers. The camel holdings of the people in our village have already drastically been reduced in the past decades from 10,000 head, or "so many that we did not even care if we lost one", to the present 2,000-3,000. Yet from the outsider's perspective (who is of course not familiar with all the intricacies of the situation), it seems as if a further reduction of animal numbers is desirable in view of the fact that the Raika camels are chronically undernourished. This would not necessarily entail a reduction of income. It is conceivable that a smaller number of well-fed camels with a low incidence of disease and hence higher reproductive rate would generate the same or more profits as the present large number of camels that teeter at the brink of starvation. It just **might** be possible that by raising inputs in terms of feed and veterinary care, the efficiency of the present low-input system could be improved.

Because there is no guarantee that a higher-input strategy would be successful, it obviously can not be imposed on the Raikas. But the approach is well worth testing by establishing a couple of experimental camel herds kept under different management conditions and with varying levels of input in veterinary care and fodder provision. The productivity and cost/benefit ratios of these herds can then be compared with those kept under traditional conditions. The intention is to conduct this applied research under the close scrutiny of the Raikas and to provide them with an opportunity to make suggestions and act in an advisory function. The outcome can not be predicted, but at least a mutual learning process about camel production would be set in motion that could eventually lead to a successful amalgamation of traditional knowledge with "modern science".⁵

3. Pastoral Information Centre ("PIC"). The efforts at the village level have to be combined with a regional approach in order to make more than a strictly localized impact. But there is a tremendous degree of variation in pastoral adaptations within Rajasthan, and a solution for the problems of the people of our village in its fertile agricultural setting would not be applicable to camel breeders in the far west who operate in an entirely different ecological context. Again, lack of information on the strategies and migratory patterns of pastoralists and their perceptions about their problems is the first obstacle to overcome. For this purpose, the School of Desert Sciences and the League for Pastoral Peoples are planning to establish an information centre that will systematically compile information on these and all related aspects, such as legal aspects of land use and tenure. Data are to be collected through our own surveys, through networking with researchers and local institutions, and by acting as a depository for all published and gray literature on pastoralism. Besides this official purpose, the centre - which we are hoping to establish in Jodhpur - will have the additional, but equally important function of acting as a forum for communication between pastoralists and people who interact with them on a research, administrative or development level. We envision "PIC" to function as an informal meeting place with a hospitable atmosphere where pastoralists can drop in on their sporadic visits into town, pick up information, as well as report about special incidents, air grievances, and even lodge formal complaints.

Suggestions for improvement

From the perspective of somebody who is trying to solve a particular problem encountered in the field, I would like to venture the following suggestions to donor-NGOs to improve their

articulation with the people. Some of them may be particular to the Indian context and NGO-set up there, but others are of general relevance.

1. Country-based donor NGOs. The donor NGOs in Delhi are, rightly, concerned with spending their money wisely and to this end they support only well-established voluntary organizations. These are generally run by outsiders, i.e. non Rajasthani natives, who possess charisma and who produce impressive reports listing the number of hand pumps installed, bore wells sunk, smokeless stoves distributed and opium addicts treated. It is absolutely not my intention to distract from such achievements; certainly these organizations do excellent work. But there are two problems with them.

First, their sphere of influence is locally restricted and they thus cover only small sections of the country. Communities who are situated outside their catchment area such as our village have no chance to receive any benefits. In order to spend their money responsibly, donor-NGOs queue up to support the limited number of reputable field NGOs, but they have no mechanisms for reaching the rest of the population. The local availability of reputable field-NGOs thus constitutes a bottleneck in the system which prevents access to the majority of the people. Donor NGOs are not to be blamed for this, but they could be slightly more adventurous in supporting fledgling organizations and new initiatives.

Secondly, the established field organizations tend to take on shades of "mini-empires", partly because they control so much money. It seems (from observation of a limited sample), that they sometimes undertake no efforts to let the deprived communities they are serving eventually become independent of their tutelage. Rather, they seem to keep

them in a perpetual stage of dependence, showering them with handpumps, energy efficient stoves, and other gadgets. Again, there is nothing wrong with such interventions, but rather than existing as ends in themselves they should be the starting points for inspiring local people to actively pursue their own development. Ideally, field NGOs should be able to form satellite organizations that can replicate their efforts in another spot to achieve a broader coverage. I think it is within the power of donor NGOs to make stipulations that all organizations they support make efforts to that effect.

2. Donor-NGOs based in the Western world. Foreign NGOs have a different perspective. Being remoter from the field, representatives of NGOs based in Europe are quite keen on the idea of supporting true grassroots efforts. They may even subscribe to the belief that this is what they are doing when they pour money into the established field NGOs, whom they only know from fleeting visits at annual or bi-annual intervals. Having to channel their money through country-based partner organizations, they are blissfully unaware of the almost unsurmountable obstacles a true grassroots initiative would face. Perhaps they can not be blamed for this, but rather disturbing is the bad opinion many of them have of pastoralists. For them, the research of the last few years that reevaluated many of the earlier fallacies about pastoralists, such as the "tragedy of the commons", might never happened. They subscribe to totally outdated concepts of pastoralists as unproductive and ecologically destructive and would like all of them to turn into settled agriculturalists.

Pastoralists are in dire need of some positive publicity and it is the responsibility of dryland and pastoral development experts such as are assembled at this workshop to remedy this. (The League for Pastoral Peoples was founded, in part, to generate some positive

publicity for pastoralists). Pastoralists have so many positive aspects to them that this poses no difficulty. The indigenous inhabitants of the tropical rainforests have gained recognition even in the general public as guardians of this ecological zone, and there is no reason why pastoralists should not gain the same credit as stewards of the world's drylands. Their role in preserving the genetic animal resources that are the prerequisite for continued exploitation of this zone for food and energy production (Köhler-Rollefson, 1992, 1993) needs to be acknowledged.

From my limited experiences with NGOs it seems as if they are basically not demand-driven and have insufficient capacity to respond to problems as they are perceived by the people and to act spontaneously on crises that arise, except earthquakes and other major natural disasters. It is not that NGOs are not interested or open, but their actions are limited by too many bureaucratic and policy constraints. They also have a tendency to follow very narrowly defined programmes and rigidly push particular concepts and project approaches that they have identified as promising, at the exclusion of any other ideas. They should be more adventurous in adopting innovative approaches and in providing flexible funding schedules.

3. The "Listening to the people" approach. This term sums up the essence of what has been missing in many development projects. Yet, "listening to the people" comes with its own set of problems, for the needs of the particular people one listens to almost invariably conflict with those of other equally unfortunate groups. The demands of the people one listens to therefore have to be balanced against those of other communities or segments thereof, as well as against those of the community at large, i.e. the state or even the rest of

humankind. At least in a situation such as in Rajasthan where resources are extremely scarce, there are so many different factions with aspirations to the same resources that supporting the wishes of one interest group will almost out of necessity proceed at the expense of others. Take our example: If you listen to the Raika men as I have been doing, they want nothing dearer than the Aravalli Hills to be opened for grazing and to have an abundant supply of medicines to treat their camels. I sympathize very much with their requests, especially in regards to the Aravalli Hills which they have used for centuries and thus have strong customary rights to. Yet, if unlimited access to the now restricted forest areas were granted, this would only be a stop-gap measure with consequences for the habitat of several forest dwelling tribal groups such as the Bhil and Grassias, as well as wildlife species. Saying this I don't want to deny the Raikas the ability to manage their resource base, but in the current situation the mechanisms that once guaranteed sustainable exploitation and amicable sharing of resources appear to be no longer functioning. Their impoverished situation and lack of alternatives will **force** the Raikas to overexploit these resources to make ends meet now, even if they are fully aware that they are mortgaging their future.

The desire for an unlimited supply of veterinary medicines is a charitable cause in its own right. But this would not only be financially unsustainable at the current relationship between costs of the medicines and camel prices. Indiscriminate use of trypanocides could also lead to drug resistance of the microorganism that causes the disease. Hence for a solution to the problem, other less convenient as well as less costly disease control strategies will have to be explored, even if the need for this is not immediately obvious to the Raikas, which will test their patience.

If you ask Raika women about their perceptions of the problems that face their community, they will rarely refer to matters of animal production. Instead, they will tell you that opium consumption and the large amounts of money spent by men on death feasts are the predicaments at least partially responsible for the demise of their community. While I wholeheartedly agree with them, this is a matter I would be far too timid to raise in the presence of Raika men. It would jeopardize my present positive but precarious relationship with the community and will have to be born in mind for future reference.

But the requests of the Raikas also conflict with those of other, even more deprived, communities. One example concerns the exotic *Acacia* species *Prosopis juliflora* imported and propagated during the British occupation as a windbreak and source of fuel. The Raikas would like this plant to be eradicated, because it is useless as animal fodder and its thorns cause damage to their animals' feet. I used to faithfully echo their sentiments, until one day I met a group of itinerant yogis, i.e. snake charmers, who extolled the virtues of this shrub as raw material for building shelters. They were totally opposed to the eradication programmes sponsored by some NGOs.

"Listening to the people" thus endows the listener with a perturbing responsibility and it invariably puts him or her into a very troublesome p(m)aternalistic position, for he or she then has to weigh all the different pros and cons, set priorities and even decide whose needs are most urgent, whose requests to leave for later, and whose to ignore. Although only the rural people can judge the impact of interventions on the local level, the wider implications of particular development strategies can, at present, be evaluated only by those outside the affected communities, since only they are aware of regional and global trends. I think -

maybe I am overoptimistic - that it is possible to share that responsibility with the people at the grassroots level!

At the moment we have a situation where the development worker has an unlimited amount of information at hand, through access to data-banks, e-mail connections to fellow researchers and so on. Compare that with the situation of the pastoralists who rely only on oral communication networks, and are thus cut off from all but the most localized events and those that affect their own community. Thus the Raikas might sense, but are not expressly aware of, the factors that are responsible for their economic crunch, such as the population explosion, the fact that livestock density has trebled, and that the CPRs have decreased by x %. Yet there is no reason why, with the help of appropriate educational material, they could not be made aware of these circumstances and learn about the developments in the world at large. By explicitly informing them about the situation in the world at large, the people at the bottom would be given an opportunity to act and react accordingly rather than engaging in the endless and fruitless lamentations over their situation that are only reflections of their helplessness.

I think putting some effort in educating people is also appropriate for the sake of achieving a more balanced and equal relationship between the "people" and the "outsiders". Traditional knowledge and "Indigenous Knowledge Systems" have become one of the most fashionable topics of research and this angle of enquiry has contributed a lot to fostering the "listening to the people" approach. But it is not free from a certain touch of intellectual appropriation. If we extract this kind of valuable knowledge from indigenous people to incorporate it into our electronic data-banks (and often for the purpose of furthering our own

careers), asking them to share with us what represents one of the few - even only -assets they have been left with, then we owe it to them to reciprocate in kind and impart relevant bits of our knowledge as well.

Sustainable exploitation of the world's drylands will only be possible if we merge local traditional knowledge with modern science, nurture an atmosphere of mutual learning between the people and the outsiders, and combine awareness of global trends and needs with consideration for local cultural ideosyncracies.

Notes

1. "Desertification and drought in South Asia" in the *Indian Express* of 11 July 1991.
2. Initially research was funded by the American Institute of Indian Studies, followed by a research grant from the National Geographic Society.
3. A voluntary organisation has been created, at least on paper, that has as its purpose the improvement of the Raikas' welfare. However, its officers are so-called 'educated' Raikas who have already distanced themselves to some extent from their pastoral traditions and believe the purpose should be the upliftment of their community through scholarships for education at various levels. The activities of this organisation will probably not be of immediate benefit to Raikas still pursuing a traditional pastoral livelihood.
4. The proceedings of this workshop are expected to appear in the beginning of 1994. The workshop was funded by NORAD, Intercooperation, the Ford Foundation and Misereor.
5. There are several potential ways for improving the profitability of the present system. One of them is looking for additional marketing opportunities for camel products. Presently

camels are sold exclusively as draught animals. Camel wool, cheese and riding camels are other options, but might be unacceptable to the Raikas. Camel meat can be ruled out, since Raikas observe an absolute taboo against the slaughter of camels and consumption of their meat would be violently opposed.

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SUSTAINABLE GROWTH IN MACHAKOS, KENYA¹**Michael Mortimore, Mary Tiffen and Francis Gichuki****Overseas Development Institute****London, UK**

"The Machakos Reserve is an appalling example of a large area of land which has been subjected to uncoordinated and practically uncontrolled development by natives. Every phase of misuse of land is vividly and poignantly displayed in this Reserve, the inhabitants of which are rapidly drifting to a state of hopeless and miserable poverty and their land to a parching desert of rocks, stones and sand" (Colin Maher, senior soil conservation officer, 1937).

At that time, the population of the Ukamba Reserve was about 250,000. Extensive livestock raising was combined with shifting cultivation on small hand-cultivated plots of maize and other food crops. Frequent and unpredictable droughts decimated food production and damaged the heavily grazed rangeland. Much natural woodland had been removed and replaced by sparse shrub- and grassland. Farm yields were low and thought to be declining, soil nutrients were depleted, the topsoil was eroding away and livestock numbers were considered to be far in excess of carrying capacity. The official view, as the quotation above made plain, was that the farming system was unsustainable, if not in terminal decline.

The Machakos miracle

In 1990, the population of Machakos District had increased by a factor of six to nearly 1,500,000. Although the district had roughly doubled in size, with the accession of previously

uninhabited crown lands, population densities increased from under 80 per km² in the wettest areas in 1932 to nearly 400 per km² in 1989, and from about 50 per km² in the drier areas to nearly 150 per km². The annual rate of population increase peaked at 3.76% in the period 1969-79. Livestock population also increased.

Agricultural output (food and cash crops, horticulture and livestock) increased from less than 0.4 tons per capita in 1932 (converting to maize equivalent at 1957 prices), to nearly 1.2 tons per capita in 1989, and from 10 to 110 tons per km² (Fig 1). Cash crops, particularly coffee, made up much of the increase during the 1970s, and fruit and vegetables production in the 1980s. Cash crops have only very occasionally occupied as much as 15% of cropped areas as there is a need to keep most land under food crops to avoid purchases at high prices in bad seasons. Nevertheless, because of their higher unit values cash crops are vitally important as income generators. District food sufficiency improved substantially, some households buying others selling. Living standards also improved through higher cash income.

Soil and water conservation structures were extended, during 1960-90, to almost 100% of the district's arable land, excepting only the flattest and least densely populated areas. By 1990, rangeland was also coming under increasingly careful management. Planting and protecting trees on smallholdings became universal practice. Measured tree densities were found to be highest on the smallest of holdings. The farming system was more, not less sustainable than thirty years before. The changes from a degrading to a conserved landscape are clearly visible in matching photographs taken in 1937 and 1990.

District features

Machakos District contains central hills rising to 1,500 m asl, and dropping to less than 1,000 m in the surrounding plains. Rainfall reaches over 1,000 mm per year on the hilltops but falls to less than 500 mm on the plains. It is distributed in two short wet seasons, the long rains (March-May) and the short (October-December). Neither may be sufficient for a crop of maize, for droughts are frequent, unpredictable, and often occur in runs of two or more consecutive seasons. Except for small areas of relatively well watered uplands (called "high potential" areas in Kenya), the district is semi-arid. The large scale migration of farming households into "low potential" zones in the 1960s and 1970s gave rise to official fears, both of ecological damage and of increased famine risk. Neither fear has proved justified.

Land-use change

During the century of British occupation of the Akamba country, land has passed from abundance to scarcity. This has led to changes in land use. Figure 2 shows some of these changes between 1948 and 1978, in three representative areas. The first area (Kangundo-Matungulu-Mbiuni) contains a high proportion of land in agro-ecological zone 3 (high-potential land). It is most densely populated and longest settled. The second area (Masii) falls entirely in zone 4 (semi-arid upland). Its population density is intermediate and it was settled by households moving out from the hills, largely before 1940. The third (Makueni) represents the drier, warmer and lower zone 4/5 areas settled after 1945.

Figures based on air photo interpretation show the extension of the arable area from 35%

to 89% in area 1, from 22% to 50% in area 2, and from 2% to 30% in area 3. The private appropriation of formerly common land (*wetu*) for cultivation took place alongside the abandonment of shifting cultivation in favour of permanent, enclosed fields: a change that was encouraged by the government. It meant a reduction in the grazing areas, the increasing scarcity of which led to their appropriation also.

Figure 2 also shows the increase of terracing on arable land. Compulsory terracing schemes were introduced in the 1940s, but they were unpopular because the benefits were unclear. Many terraces fell into disrepair around the time of independence and the figures show that in 1961 the proportions terraced in areas 1 and 2 were essentially the same as those of 1948. Later in the 1960s, however, terracing was renewed voluntarily and farmers began to construct terraces within a few years after opening new land, even in the newly settled areas (like area 3), where average slopes are much less steep. Unterraced arable land had been virtually eliminated in all three areas by 1978, though elsewhere in agro-ecological zone 5 it might still be found. It is significant that most progress was made between 1961 and 1978, when the arable area was itself growing rapidly. Terrace construction continued in the 1980s, and was promoted by the Machakos Integrated Development Programme. By 1990 erosion was considered to be under control on arable land. The problem was, however, only beginning to be solved on grazing land.

Making the most of water

Terracing, originally introduced as a soil conservation measure, also increases soil moisture. In the late 1940s, shallow narrow-based terraces, with the soil thrown downslope (*fanya chini*) were recommended for African smallholders. They were believed to use labour more efficiently, at

a time when labour and tools were scarce, than bench terraces made by throwing the soil upslope (*fanya juu*). However, farmers began to switch over to bench terraces in the 1950s. In 1961, the area conserved by narrow-based terraces had fallen to 19,000 ha (from 35,000 in 1957), partly from poor maintenance and partly due to conversion to bench terraces. By 1990, less than 5% of all terraces were narrow-based (Gichuki, 1991).

Bench terraces were desired initially for vegetables, which became profitable in the early 1950s. When African farmers were permitted to grow coffee (from 1954), they were subjected to stringent rules which included the construction of bench terraces. Now they are used for all crops. Bench terraces waste no land, as the bank can be used for fodder crops and the ditch can be planted with fruit trees. They are better at water conservation because the ditch at the rear provides water to the terraces, not, as on narrow-based terraces, to the bank. Maintenance costs are lower. The population growth and associated diminution in holding size increased the incentive to invest in the land.

A major reason given by farmers for constructing terraces was observed yield improvements. Labour, which used to be organised through government compulsion, was later on provided through community self-help groups (*mwethya*), which could work on private farms in turn. It is now often hired. Terrace building calls for substantial labour mobilisation for short periods and may therefore be beyond the resources of the household, unassisted. Much, if not most, labour is provided by women, as men are more involved in off-farm work.

Water scarcity, whether for domestic, livestock or crop use, results from the low and variable rainfall, high runoff losses, momentary stream flow, low groundwater yield, low

moisture holding capacity in soils and high rates of evaporation. Most critical is water availability for arable farming. Various strategies are available for maximising the efficiency of water use. Smallholders in Machakos learn from their neighbours, extension officers and their own experiments. For example, on the 2 ha farm of Mr Musyoki, in agro-ecological zone 4, the following measures may be observed: cut-off drain with bananas planted in pits, bench terraces, diversion of roadside runoff for crop use, conservation tillage, mulching, weed control and manuring, mixed cropping with fruit trees, beans and maize, live fencing used as a windbreak, supplemental irrigation from pond storage for vegetables and the use of grafting to diversify and improve fruit yields (Fig 3). Mr. Musyoki used to be a waiter in Nairobi. He started farming on degraded land in 1970.

Recycling soil nutrients

Soils of Machakos are naturally deficient in phosphorus. Repeated cultivation without fertilisation reduces nitrogen, carbon and exchangeable cations to low levels (Table 2). Even long fallowing under grazing fails to restore soil nutrients to the levels found on uncultivated land. Fertility management is therefore critically important for the sustainability of arable farming.

There are four main soil improvements options: inorganic fertilisers, *boma* (farmyard) manure, alternative organic sources (compost, mulches, green manure), and use of nitrogen fixing legumes as intercrops, rotations or farm trees (Mortimore and Wellard, 1991). Except for the use of nitrogen fertilisers on the profitable coffee crop, manure has been the mainstay of soil improvement efforts since the 1930s and 1940s, when it acquired a commercial value and the Department of Agriculture started promoting it. Adoption is now nearly complete, in terms of

the numbers of farmers using it. However, supply constraints (number of livestock or working capital available) restrict its application on most farms to levels well below those desired for optimal nutrient supply.

Composting offers an addition to manure and by combining manure with plant materials, it can double the supply of organic material available. It was first promoted by the Department of Agriculture in the 1930s, but did not become popular then. Recently, it has been taken up again by NGOs working in the district. In a scheme run by the Kenya Institute of Organic Farming, farmers' groups combine their labour for compost making using, amongst other materials, the invasive weed *Lantana camara*. The system represents a further step in labour intensification.

Manure and compost improve nitrogen and phosphorus levels, soil structure and moisture retention. Leguminous crops are already important. Inorganic fertilisers usually cannot be justified economically, except for high value crops such as coffee (138 kg/ha in 1988). Although use on food and horticultural crops increased in the 1980s, averages are still very low (1.6 kg/ha in 1988). Inorganic fertilisers have always been recognised as a second best to manure.

It is not known what quantities of manure are applied in the district. However, since the 1930s, the output of food and cash crops and horticulture has increased by a factor of 11 per hectare, while the area of arable land has grown by a factor of 6 (Rostom and Mortimore, 1991). The (inadequate) data indicate that crop yields did not fall, and probably rose, both for maize and for the market crops (Mbogoh, 1991). Farmers combine a research-derived drought tolerant maize variety with local varieties.

Feeding livestock

Livestock data are weak and contradictory. However, the number of stock units (1 unit = 1 cow or 5 sheep/goats) seem to have risen from just over 200,000 in the 1940s, a time of frequent droughts and high mortality, to at least 334,000 and possibly as many as 588,000 in the 1980s (Ackello-Ogutu, 1991). Allowing for the change in area, overall densities fell from 2.4 ha/unit in the 1940s to 4.4 in the 1980s (if the lower figure is accepted) or remained virtually the same at 2.5 (if the higher is accepted). In high population density areas the need for more productive feeding systems was unavoidable as, owing to subdivision on inheritance, the average size of Akamba holdings is constantly diminishing. The transformation of livestock feeding systems, which is yet incomplete, consists of three linked steps (Mortimore and Wellard, 1991).

First the private appropriation of almost all common land forced a matching of stock holdings with carrying capacity at the level of the individual farm. Otherwise degradation threatened the long-term viability of the holding, a critical consideration in planning for one's heirs. In agro-ecological zone 5 no evidence was found of grazing-induced degradation of the natural vegetation. Rather, the proscription of fire as a management tool has allowed the increase of woody species on rangeland where grazing has been introduced mainly during the last three decades. On private land with a long history of intensive grazing in zone 4, farmers employ destocking, grass planting, control of unwanted species and tree protection to manage the ecosystem sustainably. The stabilisation of formerly mobile grazing circuits within the bounds of private holdings increased the use of crop residues as fodder. Maize stalks and bean haulms are used universally for this purpose.

Second, fodder grasses and trees are now grown on terrace banks and farmlands respectively. Fodder grasses were promoted by the government as long ago as the 1930s. In the early 1950s it was shown in a government experiment, at the "Makaveti square mile", that such grasses grew well even on degraded land, and that they could support much higher cattle densities than had been thought possible, namely up to 0.4 to 1.6 ha per livestock unit (Ackello-Ogutu, 1991). Today, the grasses *Pennisetum purpureum* (Napier grass) and *Panicum makarikariensis* play an important role in integrating the crop and livestock sectors and intensifying the farming system.

Third, stall feeding of livestock is practised now by 59% of cattle, 53% of sheep and 50% of goat owners, respectively, for part or all of the year. This method permits more efficient use of residues and fodder crops and more systematic use of manure. It disposes of the problem of where to put livestock during the growing season, on crowded arable holdings, and protects terraces from damage by grazing animals.

Ecology and population density influenced the adoption of both fodder production and stall feeding. In Kangundo (area 1 in Fig 2, and in agro-ecological zone 3), almost all farmers are now reported to plant fodder, and stall feeding is the most common feeding system. In Masii (area 2, and in zone 4), only a few plant fodder or practise stall feeding. In Makueni (area 3 and in zone 4/5), while some plant Napier or Rhodes grass, stall feeding was tried earlier but abandoned. In Ngwata, in zone 5, no farmers do either (Mortimore and Wellard, 1991).

Finding capital

Even when land was abundant, capital was necessary for its development. As land scarcity increased, capital supply became critical in the adoption of technologies of intensification and conservation: the construction of terraces and other soil and water conservation structures and enclosures, the purchase of fertilisers, the acquisition of ploughs or fixed farm capital, entry to coffee production, the purchase of improved livestock and access to markets.

The experience of Machakos supports the Boserup hypothesis that increasing population density leads to intensification through changing labour to land ratios. However, labour intensification cannot be isolated analytically from capitalisation. Labour for land improvement and tree planting was hired, as well as supplied from family and communal sources. Not only does capital substitute for labour, but in many technologies it supplements it. For example: terrace construction requires tools, effective manuring and composting require ox-carts and water drums, grade livestock require frequent dipping, coffee and vegetable crops need purchased inputs.

The Community Development Department (under the leadership of John Malinda) adapted the traditional mwethya work party, used to create new farms or houses, to the needs of soil conservation in the 1950s. The mwethya groups appointed their own leaders and worked on their members' farms in turn. Leaders and musicians were often women, since so many men were away working. Nowadays they are used to raise both capital and labour, for community as well as private projects - schools, bridges, businesses as well as terraces - while NGOs are using them to identify, plan and carry out projects. The mwethya groups, therefore, have made a

major contribution to the capitalisation of the economic landscape (Mbula Bahemuka and Tiffen, 1991).

However, capital was also derived from farm profits (sales of livestock and crops) and savings from waged work or non-farm enterprises. We were unable to measure the respective contributions of labour and cash investments, but there is no doubt the latter were substantial.

Conclusion

Change, intensification and conservation were driven by population growth, increasing land scarcity, investment, and new information and technologies. In livestock management, the evolution from extensive grazing in the 1930s, through increasingly labour-intensive methods, to the growing popularity of stall feeding in the 1990s, illustrates the general trend towards intensification. In the process, the Akamba have come to value livestock not only as a savings reserve, which can be utilised in emergencies or to provide investment capital, but also as sources of farm energy, manure, and regular income from milk and meat sales.

It is a major conclusion of this study that the market facilitated and promoted change. In the 1930s, better-off farmers invested in ploughs to produce maize for the market. Coffee generated investment income in the high potential areas from the 1960s. Canning factories and traders were amongst those providing credit, incentives and information for fruit and vegetable production. However, it is questionable whether reinvestment of agricultural profits could alone provide all the capital needed to transform the farming system. To a certain extent, capital can and did take the form of direct labour investments, by family labour or groups. The external

labour market was also an important source of both capital and information. Many Akamba joined the army and police, travelled widely and brought back savings and new ideas. Education was seen as giving access to employment outside the district and outside the farming sector, the value of which in years of crop failure and livestock mortality was apparent. Households used income diversification both to secure themselves against risk, and to build up savings for investment in the farm (as illustrated by Mr. Musyoki's farm). Other investments, of work and cash, were in community infrastructure, such as feeder roads and schools.

A typical investment cycle was to seek market participation, either for labour or for farm products, to generate income. This income was used to educate children. Some children, (predominantly males, but increasingly, females also) on attaining maturity, took jobs inside or outside the district, sending part of their earnings to support the family and/or to finance investments. Productive investments increased farm incomes and the value of the land. The holding was subdivided on the owner's death amongst heirs, into smaller but by then more fertile parts, and the cycle was repeated.

The most important implication of this development is that technological change was functionally linked with income diversification and increased market participation: the sustainability of the farming system cannot be considered in isolation from the household economy as a whole. The relatively small areas of high value crops, typified by Mr. Musyoki's vegetable plot, help to generate the incomes which enable farmers to improve their houses, and to purchase more goods and services, thus creating more off-farm employment locally. By 1981-82 a national survey showed that in Machakos only half the rural income was generated by the farm, the rest by other activities. In some of the more densely populated districts of Kenya, with

higher average incomes than Machakos, the proportion of non-farm income is even higher.

What future for Machakos?

Although typical family size is now being reduced in Machakos, population will inevitably continue to increase, given the age structure. There is still scope for agricultural intensification in parts of the district, which could be facilitated by improving market access. Output per hectare in a given agro-ecological zone is far higher on small farms than on large, as the small farms use more working capital per hectare (Tiffen, 1992). At the moment, the insufficient road network is decaying, limiting marketing opportunities for milk and vegetables and reducing farm-gate prices on livestock and other products. People are energetically seeking new non-farm income sources. Craft industries, such as the manufacture of the well-known Machakos sisal basket, woven by women, or the wooden carvings made by men, are expanding. Village leaders we interviewed in a very densely populated area said they needed rural electrification, to enable them to process more agricultural products, to establish more workshops catering for local needs and to generate more employment. This is happening in the few places in Machakos that have good roads and an electricity supply.

Machakos will change again in the future. Given policy support, it will become more urbanised and industrial. However, there is no reason to think that this will undermine the sustainability of its agricultural base.

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CAPTIONS

Figure 1: Agricultural output per head, 1930-87, converted to maize at constant 1957 prices.

Figure 2: Landuse in three areas, 1948, 1961 and 1978, from air photo interpretation

Figure 3: Mr. Musyoki's farm demonstrates ways of conserving water and increasing crop output which are now common in Machakos.

Table 1: Maximising the efficiency of water use

Table 2: Chemical properties of soils under three management regimes

Property	Long term management regime		
	Uncultivated	Grazing	Cultivated
Soil pH (water)	5.5	5.4	5.0
Potassium (meq)	0.56	0.4	0.29
Calcium (meq)	8.7	2.4	1.1
Magnesium (meq)	3.4	1.4	0.9
Phosphorus (ppm)	23	14	13
Nitrogen (%)	0.35	0.18	0.11
Carbon (%)	2.49	1.25	0.74

Note: Soils with known management histories in Kilungu location were sampled from the top 20 cm at three sites under each management regime in each three areas (27 composite samples in all). Source: Mbuvi (1991).

**THE MANAGEMENT OF NATURAL RESOURCES IN THE VILLAGE LAND
MANAGEMENT PROGRAMME IN BURKINA FASO**

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Introduction

The National Village land management programme was launched in Burkina Faso¹ in 1987, and its innovative approach is a source of considerable hope. Seven years later, what comments can be made about the management of natural resources using this approach?

Definition of village land management ("gestion des terroirs"): the programme in question is a national one², linked to the political will of the government to decentralise. It is an attempt to make the concept of sustainable development more effective. The approach is holistic, experimental and participatory. Under the village land management approach, programmes are designed so that decisions are taken in the village lands themselves, with a constant eye on the post-project period, to ensure that all management and decision-making operations can be eventually transferred to the local communities.

The approach began to be discussed in Burkina Faso in 1986 and the project was launched in pilot villages in 1987. The concept of village land management is applied in all projects and almost all rural development activities in Burkina Faso. Village land management project includes three associated tasks: effective natural resource management, the creation of

social infrastructures and economic regeneration (local development). This report considers how effective the approach is in the area of natural resource management.

Village land management in the traditional context has always existed in Burkina Faso but has deteriorated severely owing to successive droughts, animal and human population pressures and an increasingly unsuitable local political and social environment. This report discusses how village land management was carried out, why a village land management programme became indispensable and what results are achieved by village land management in the field of natural resource management.

Natural resource management before "Village Land Management" was launched

Definition of "village land"

The definition of village land may be exogenous (agricultural and geographical) or endogenous (defined by local inhabitants). The agricultural and geographical definition applies to the extent of the lands used by a village or community for the purposes of agriculture, pastoralism or forestry.

The cultural or sociological definition includes other elements: It refers to the space defined in a local language (e.g., Tenga, Dugu, Ndeogo, Sumur, Tingan or Tara) which is occupied by a community united by religious practices (such as agrarian and land-tenure practices, the prohibition against the spilling of blood, the obligation to participate in village festivities, symbolic fees paid after the harvest or to gain access to land - demonstrating a

systematic approach to land management and the bazga and langabare chieftainship festivities) and by a political organisation (this may or may not be recognized by the national authorities but, in general, will deal with family and marriage disputes and with disputes between farmers and pastoralists). The boundaries of this space could have shifted over time - a delicate issue in village land management, which has caused the staff of certain projects to give up demarcating village lands as it provoked or rekindled disputes between neighbouring villages).

The spontaneous management of village land: natural resource management and the social control of space

Anywhere in Burkina Faso, regardless of the degree of physical degradation, one can find manifestations of a 'spontaneous' land management. In Kéné Dougou (nicknamed the 'garden of Burkina'), for example, the traditional authorities (sumurtin) reserve one third of the land for grain by prohibiting the planting of trees on this land. This is a pre-condition for lending land to strangers (Faure, 1992). But one hectare of bananas yields more than one million CFA francs a year to the user, which causes young people returning from Côte d'Ivoire to try and extend as much land as possible under bananas. The chiefs of the local clans consider this trend as a threat to food production.

In Marka country, in Mouhoun Province, the straying of livestock during the crop growing season is controlled by the perende, traditional censors³. These soldiers of the chiefs have the right to confiscate any animal found wandering free after the beginning of the planting. If the owners don't claim them, or pay a fine, the perende have the right to sacrifice the animals at bush altars and eat the meat. This threat results in effective guarding of livestock, which

protects the fields.

Everywhere in the country tree management (harvesting and cutting) displays strict rules. In the fields surrounding a village, the land owners confer the right of harvesting to land borrowers, who cannot cut down or plant trees. All fruit trees are protected⁴, but harvesting in the bush is free. The problem in the bush is tree-cutting: only sacred forests and certain trees⁵ cannot be felled because they harbour genies to which indigenous clans are tied, or because they are reserved for blacksmiths or timbermen.

In Bissa country, Boulgou Province, fishing and hunting are strictly controlled by the local socio-cultural lifestyle. The Woozi swamp, in the Lenga bush country, surprised experts before the construction of the Bagré dam. They found there rare fish species and wondered why no one fished for them. The anthropological explanation for this is based on two concepts which define the control of the swamp by a hunter who lives near by. The types of this control are both material and 'ideal', according to the terms of Godelier (1984), and they ensure a social environment that facilitates the maintenance of the ecological milieu. The hunter gained this social distinction as a result of a series of initiation trials, which were reserved to members of a certain matrilineal clan. He is at the same time a hunter, a diviner and a healer. His ecological skills are due to his material knowledge (fauna, flora, minerals and humans) and to the Bissa social and cultural organisation. The latter includes an 'ideal' consensus that makes him both the guardian of the greatest genie in the local pantheon (the swamp), and the carrier of the oracular word, that which resolves all of the village disputes.

'Spontaneous' natural resource management does not function effectively today. Many of the 'ideal' controls of nature have disappeared with the migrations of the last ten years, and the new arrivals do not share the cultural traditions of the autochtones. However, traces of these politico-ecological structures remain, which need to be renovated and restructured with a democratic sharing of powers.

Reasons for the implementation of an Village Land Management programme even when "spontaneous" village land management is already being practised

In Burkina Faso there has been, by and large, a decline in the tenure of village land by indigenous peoples, a trend that started before the Revolution of 1983. There are various reasons for this: Islam has been able to create new communities of interests, as alternatives to traditional culture, and organised networks are being set up; the customary authorities have been corrupted by the politics of electioneering and have become discredited. This trend was further strengthened by the announcement over the radio by Réorganisation Agraire et Foncière (RAF), the body responsible for agricultural and land reform, that the land belongs to the State. This statement caused the displacement of people and altered land use, both within village lands and at the national level. It resulted in the uncontrolled land clearance and a policy of land-use based on an improper interpretation of the words: "the land belongs to the person who cultivates it".

The result was the devastation of the country's land and the government's response has been to launch its Village Land Management programme. Since 1991, the goal of the Village Land Management programme has been to restore to local people their land rights.

To illustrate the loss of the customary authorities, control over land and how the Village Land Management programme has fostered a new approach to natural resource management, we can take the example of Diarkadougou, which is almost a caricature. In the village lands of Diarkadougou, in Bougouriba Province, 150 migrant families from the Mossi plateau have set up home over the last two years, without permission from the puguli - the customary authorities, and they have established two villages. These two villages outnumber the local 50 families. The Islamic Tijaniyah order in Ramatoulaye has recently set up a highly organised network in the west of Burkina Faso. Its members gather in Ramatoulaye for Muslim feasts (Mawlid, Tabaski) and they are transported in buses chartered by their sheikh in the province of Yatenga in the north. The autochtones have seized the opportunity offered by the Village Land Management programme workers to try and regain control of their land.

Migrations, caused by the desertification of the Mossi Plateau and the announcement by the Revolution of the end of the power of local chiefs, have led to a wastage of natural resources in the south and west of Burkina. However, this phenomenon raises an ambiguous question: can one choose between reducing grain production in order to protect local natural resources? The Mossi are large scale producers. Thanks to the labour force of the talibé (Koranic students, of which there are 600 in a single Mossi quarter of a village in Kéné Dougou), a single clergyman in a small village in the Bougouriba is able to cultivate more than 30 hectares. Every year these farmers destroy thousands of hectares in forests preserved by the indigenous peoples of the west. Should this cultivation be prohibited, since Burkina Faso's grain deficit is only 20,000 tonnes, as compared to that of another Sahel country, Senegal, which amounts to 400,000 tonnes? The solution chosen by the village land management approach is a compromise: through concerted dialogue with the newcomers, the destruction they cause in forests should be reduced. At the

same time the project is organising timber exports with outlets in Bobo-Dioulasso. The resource is taking an economic value appreciated by all. This example demonstrates that village land management is a holistic enterprise. Participants do not act in sectorial fashion, they do not seek to preserve at any cost natural resources. They are looking for an equilibrium between the local and the global: the idea of protecting local resources is integrated with the national imperatives of production and food security.

What are the results of the village land management programmes on natural resources?

The village land management approach consists in the following: diagnostic studies in consultation with the local people, making an inventory of resources and needs, prioritisation of actions to be undertaken, assessment of funding needs; formulation of a village development plan or a village contract; appointment of a village land management committee and drafting of its regulations.

Specific actions are carried out by all projects in parallel to these various phases: organisation of a grain bank, assistance for the restoration of the soil, the construction of a mill for the women and the provision of social infrastructure (water, a school, a clinic etc).

The implementation of a village land management programme has a double impact: it gives structure to the space and it organizes the producers, who then demand recognition of their right to manage natural resources.

Let us consider one or two examples:

In the cotton-growing region in the west of Burkina Faso, Houet Province, the villages of Kimi and Sébédougou both embarked on village land management programmes, which were concluded in 1992. It is instructional to look back and see what has survived of the experiment. In the two villages the same approach was followed: demarcation of the village land, zoning - in other words, allocation of areas of land for specific purposes (grazing, agriculture, woodland development or forestry) and appointment of a village land management committee entrusted with drawing up regulations and ensuring their observance.

In Kimi, the zoning exercise forced 80 families to move their holdings, which were located on the designated cattle trail and in protected woodlands. Since the end of project, management of the village land has been taken over by the dugutigi (the land chief, a customary authority abolished by the Revolution, which was the context in which the village land management programme was launched). The village land management committee was disbanded and the land chief drove away the forestry officials, closed down the tree nursery and prohibited villagers from planting trees (which he regarded as a threat to his land rights). Farmers are no longer joining in collective efforts to build stone lines (but they continue to lay them in their own family plots), or to dig cess-pits. All the same, several of the innovations introduced by the village land management programme survive, and these have even been adopted by the entire village: the "zoning", despite having required action by the administrative authorities, has been preserved, since the villagers could see for themselves that it protected their cotton crop, their primary agricultural resource, from being trampled by cattle. Measures to check the extension of plots have also been adopted, putting an end to the annual uncontrolled clearances of new

land.

Similarly, in Sèbédougou, the practice of zoning has continued after the project ended and surveillance is maintained over the reserve where wood-cutting is prohibited. As in Kimi, the village land management committee has been disbanded, since it was in effect a subsidiary of the cotton-growers' group, which was composed of the same people and financed all the activities.

In the last analysis, it is evident that the villagers have accepted the approach, jettisoning its more restrictive elements and those which struck them as of little use (the collective cess-pits and stone lines and the tree nurseries). They have preserved the things which really help organise their lives: the structuring of their space ("zoning") and the use of regulations for the management of natural resources (covering the extension of plots and the settlement of migrants).

These two fairly similar case-histories, also have the effect of demonstrating how quick farmers are to adopt measures when they serve their purposes. The neighbouring village of Intiédougou, which was outside the programme, anticipated the actions of the support services and set about demarcating its frontiers and implementing a zoning exercise. In this way, the village land management approach was spontaneously disseminated in 1993.

We may cite another example of farmers organising themselves to structure their space and to improve control over the management of their natural resources, through a village land management programme: the Kaabo-Gountouré agro-pastoral unit in Séno Province. The

project prudently avoids demarcating land lest it provoke conflicts among neighbours. The agro-pastoral unit concept is an innovation consisting in demarcating territory for the agro-pastoralists in the region, based on the use of communal resources such as low ground and pastures. The project only undertakes to inventorize the resources, both from maps and *in situ*. The producers go further and demarcate their own lands.

It might be asked why they undertake this demarcation. In Sambagou, the farmers say: "The dam is our dam. All cattle have the right to come and drink, but everyone must know that the dam belongs to us". The management of communal property should therefore have people in charge. In Kaabo, during the following agricultural season in July 1993, the agro-pastoralists settled a conflict caused by cultivation on a cattle track. The villagers controlling the land across which the cattle track lay told the farmer that he was in the wrong. They referred to their new village land management committee, and also to the way the village land had been demarcated. The farmer conceded the case, without intervention by any administrative authority or the government technical services. Nevertheless, the villagers are aware that the authority which they currently hold is very limited and they are demanding official recognition of their right to manage their natural resources. They want to be able to lay down regulations for cutting trees and gathering their products (branches, leaves and flowers) and to deal directly with violators or applicants, without involving the forestry services. Demands of this sort would be unthinkable without the Village Land Management programme.

Conclusion

The results are therefore clear. The structuring of space - demarcation of the village lands and their allocation for specific activities - and the organisation of the local farming communities constitute the foundation for the decentralised management of natural resources. The village land management committee still needs to be able to obtain, on request, official and permanent rights, compatible with the work of the technical services (in particular the forestry services).

Notes

1. Burkina Faso is located in West Africa. It is a land-locked country of 274,000 km², bordered by Mali, Niger, Benin, Togo, Ghana and the Côte d'Ivoire. There are 7-8,000 villages with a resident population estimated at more than 9 million people.
2. Programme National de Gestion des Terroirs.
3. Wearers of the Do cult masks, perende ('children of the bush') are appointed by a land chief from amongst the non-Muslim indigenous elders.
4. Some of the fruit trees are: *Parkia biglobosa* (néré), *Butyrospermum parkii* (karité), *Adansonia digitata* (baobab), *Tamarindus indica* (tamarind), *Lannea microcarpa* (raisin), *Ziziphus sp.* (jujube), *Ficus sp.* (fig) and *Bombax costatum* (kapok).
5. For example, *Dispyros mespiliformis* (ebony), of which the branches serve as supports for transporting the dead, *Stereospermum kunthianum* ('the tree of sleep'), which produces a hallucigenetic smoke, *Gardenia erubescens*, *Lannea acida*, *Afzelia africana*, *Maninkara multipervis*, *Anogeissus leocarpus*, etc.

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**USING INDIGENOUS KNOWLEDGE FOR SUSTAINABLE DRYLAND
MANAGEMENT: A GLOBAL PERSPECTIVE**

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Introduction

Small-scale farmers and pastoralists constitute by far the majority of the rural population in arid and semi-arid ecological settings. Because of the rapid rates of population growth, small-scale producers are obliged to produce their energy, food, fodder, and income from decreasing supplies of land (Kotschi, 1989). This process often leads to soil degradation, soil erosion, and woodland and pasture destruction in rural parts of developing countries. In many developing countries considerable efforts have been made to conserve soil and water resources. However, a number of dryland management schemes have failed due to inappropriate approaches and inadequate understanding of the socio-economic conditions (Rajasekaran and Martin, 1988; Reij, 1991).

The most important reasons for these failures in soil and water conservation programmes include a dominant top-down approach, and the use of systems which are complicated, expensive, and difficult to maintain, in terms of both labour and capital. Such systems may be difficult to replicate. There is also insufficient training of local users of the system, and a heavy reliance on imported machinery for the construction of conservation works (Reij, 1991). All the

more important, attitudes generated by the top-down transfer of technology such as ignorance of local systems by technical assistants, scientific reductionism, and short time horizons have precluded the exploration of local knowledge and decision-making systems and the local organizations involved in the identification of local-level problems and the search for their solutions (Chambers, 1991).

In addition, a number of research station-based dryland technologies have little relevance to small farm conditions. According to Sanghi and Kerr (1991), the conventional graded bunding system in Andhra Pradesh State, India, is not an appropriate dryland technology under small-scale dryland farming conditions due to the following reasons:

- * Continuous bunds leave corners in some fields thus creating the risk of losing the piece of land to the neighboring farmer;
- * Contour farming causes inconvenience in field operations (particularly where multi-row implements are used) and reduces the efficiency of operations (where the *desi* plough is used) due to repeated cultivation in the same direction;
- * Systems based on a central water course provide benefit to some farmers at the cost of others with regard to disposal of excess runoff; and
- * The overall system emphasizes only long-term gains, hence creating an impression that short-term gains are not possible through such measures (Kerr and Sanghi, 1991:2).

In another case study from south of the Sahara, water-harvesting projects for impoverished nomads have not been successful due to the following reasons (Reijntjes, 1986):

- * Cropping does not fit well into the nomadic strategy for survival, in which mobility plays an important role;
- * Working the soil is not highly esteemed among nomads;
- * Land use is often communal, which complicates issues of individual or group investment in rangeland improvement or tree growing and how the benefits will be shared;
- * Because of the high climatic variability, especially in drier areas with red soils, the reliability of the water-harvesting system is low.

On the other hand, several recent publications on indigenous knowledge systems indicate that they form the most viable basis for sustainable approaches to development of workable dryland management and drought mitigation strategies for the future (Ayers, 1994; IFAD, 1993; Mathias-Mundy et al., 1992; Pawluk et al., 1992; Phillips-Howard, 1993; Rajasekaran and Warren, 1990 and 1994; Reij, 1991 and 1993; Richards, 1985; Stigter, 1994; Warren, 1991a&b; 1992a&b; 1994 a&b; Warren and Rajasekaran, 1994). These studies have begun to influence the attitudes of policy makers and development planners to consider the role of indigenous knowledge in sustainable development (Warren and Rajasekaran, 1993 and 1994).

The purpose of this paper is to explore the value of indigenous knowledge systems and indigenous organizations as they relate to sustainable dryland management and to provide policy guidelines for incorporating indigenous knowledge systems into dryland management programmes.

The specific objectives of this paper are:

1. To explore the value and importance of indigenous knowledge systems to sustainable development;
2. To describe several case studies on indigenous knowledge as they relate to dryland management; and
3. To develop policy suggestions for incorporating indigenous knowledge systems into dryland management programmes and projects.

Indigenous Knowledge: A Valuable National Resource

What is indigenous knowledge?

Indigenous knowledge is local knowledge that is unique to a given culture or society (Warren, 1987). Indigenous knowledge is the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments, and intimate understanding of their environment in a given culture (Rajasekaran, 1993). According to Haverkort (1994), indigenous knowledge 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 labourers, women, rural artisans, pastoralists, and cattle rearers are the custodians of indigenous knowledge systems. These people are well informed about their own situations, their resources, what works and doesn't work, and how one change might impact other parts of a given system (Butler and Waud, 1990). Rural populations have a variety of formal and informal organizations through which citizens identify, discuss and prioritise community-level problems and seek mechanisms to solve them--often through local-level experimentation and innovations (Warren, 1992a; Rhoades and Bebbington, 1994).

Diversity of indigenous knowledge

Indigenous knowledge systems are:

- * adaptive skills of local people usually derived from many years of experience, that have been communicated through "oral traditions" and learned through family members over generations (Thrupp, 1989);
- * time-tested agricultural and natural resource management practices, which pave the way for sustainable development (Venkatratnam, 1990);
- * strategies and techniques developed by local people to cope with the changes in the socio-cultural and environmental conditions;
- * practices that are accumulated by farmers due to constant experimentation and innovation;

- * trial-and-error problem-solving approaches by groups of people with an objective to meet the challenges they face in their local environments (Roling and Engel, 1988); and
- * decision-making skills of local people that draw upon the resources they have at hand.

Indigenous knowledge as a valuable resource

Indigenous knowledge is dynamic, changing through indigenous mechanisms of creativity and innovativeness as well as through contact with other local and international knowledge systems (Warren, 1991a). These knowledge systems may appear simple to outsiders but they represent mechanisms to ensure minimal livelihoods for local people. Indigenous knowledge systems often are elaborate, and they are adapted to local cultural and environmental conditions (Warren, 1987). They are tuned to the needs of local people and the quality and quantity of available resources (Pretty and Sandbrook, 1991). They pertain to various cultural norms, social roles, or physical conditions. Their efficiency lies in the capacity to adapt to changing circumstances. According to Norgaard (1984:7):

Traditional knowledge has been viewed as part of a romantic past, as the major obstacle to development, as a necessary starting point, and as a critical component of a cultural alternative to modernization. Only very rarely, however, is traditional knowledge treated as knowledge *per se* in the mainstream of the agricultural development and environmental management literature, as knowledge that contributes to our understanding

of agricultural production and the maintenance and use of environmental systems.

Indigenous knowledge includes practical concepts that can be used to facilitate communication among people coming from different backgrounds such as local populations, agricultural researchers and extension workers (Warren, 1991a). Indigenous knowledge helps to assure that the end users of development projects are involved in developing technologies appropriate to their needs. By working with and through existing systems, change agents can facilitate the transfer of technology generated through the international research network in order to improve local systems. Indigenous knowledge is cost-effective since it builds on local development efforts, enhancing sustainability and capacity-building (Titilola, 1990).

Undermining indigenous knowledge can lead local people to become increasingly dependent on outside expertise (Richards, 1985). The greatest negative consequences of the under-utilization of indigenous knowledge, according to Atte (1992:30) are the following:

Loss and non-utilization of indigenous knowledge results in the inefficient allocation of resources and manpower to inappropriate planning strategies which have done little to alleviate rural poverty. With little contact with rural people, planning experts and state functionaries have attempted to implement programmes which do not meet the goals of rural people, or affect the structures and processes that perpetuate rural poverty. Human and natural resources in rural areas have remained inefficiently used or not used at all.

Establishing indigenous knowledge centres and networks

Regional and national indigenous knowledge resource centres have embarked on systematic recording of indigenous knowledge systems for use in development. Three global centres, CIKARD (USA), LEAD (The Netherlands), and CIRAN (The Netherlands) facilitate the establishment of these centres. The two regional centres for Africa and Asia are located in Nigeria and the Philippines, while national centres now exist in Mexico, the Philippines,

Indonesia, Ghana, Kenya, Sri Lanka, Brazil, Venezuela, South Africa, Burkina Faso, and Germany. The three global centres provide a partnership relationship with the regional and national indigenous knowledge resource centres by: (1) developing guidelines to establish indigenous knowledge resource centres; (2) coordinating the activities of regional and national centres; (3) compiling a list of documents held at CIKARD and making it available to the centres; and (4) developing human resources for the regional/ national indigenous knowledge resource centres.

The functions of national indigenous knowledge systems resource centres include:

- * providing a national data management function where published and unpublished information on indigenous knowledge is systematically maintained for use by development practitioners and local communities;
- * designing training materials on the methodologies for recording indigenous knowledge systems for use in national training institutes and universities (Warren and Rajasekaran, 1994); and
- * establishing a link between the citizens of a country who are the originators of indigenous knowledge and the development community.

A complementary networking system is being established through the efforts of Anil Gupta at the Indian Institute of Management, Ahmedabad, India. A newsletter, *Honey Bee*, now published quarterly and translated into a growing number of languages within Indian and in other countries, documents indigenous innovations, many of which are found in arid and semi-arid ecological zones (Gupta, 1989).

The *Indigenous Knowledge and Development Monitor* is the quarterly newsletter of the growing global network of regional and national indigenous knowledge resource centres. It is published in The Hague at CIRAN, the Centre for International Research and Advisory Networks.

Case Studies on Indigenous Dryland Management Practices

Indigenous dryland management strategies that are evolved, modified, and adopted by local people are effective starting points while planning and implementing new dryland management programmes. Prior to designing and developing dryland projects, it is essential for planners and practitioners to understand how indigenous dryland management strategies work in complex agro-ecological and socio-cultural environments of the small-scale farmers and pastoralists. A search was conducted at the documentation unit and library of the Centre for Indigenous Knowledge for Agriculture and Rural Development (CIKARD) in order to identify case studies pertaining to indigenous dryland management. The following case studies represent the wide spectrum of indigenous dryland management practices adopted by farmers in Africa and India.

Stone lines in Burkina Faso

The Mossi people of Burkina Faso developed stone bunding for soil and water conservation (Reij, 1991, 1993). The bunds (lines of stones) built over the years reach a metre high, effectively terracing the slopes with relatively little labour input, most of it during the dry season. After a series of droughts in the 1970s, the stone bunds were spontaneously revived and combined with *zay*, or pits, which conserve water and in which organic material is placed to increase soil fertility. At the same time, introduced systems were shunned (Anon. 1993).

The bunds are semi-permeable, allowing some water to pass through. The water that would have otherwise "run-off" the fields and caused erosion, is able to slowly sink into the ground and benefit the crops. Erosion is avoided, and the gradual seeping in of the water to the soil helps to build up soil fertility. In the disastrous drought years of 1983 and 1984, crops grew up on land with bunds, while adjoining fields grew nothing. Four years ago, the UN's International Fund for Agricultural Development (IFAD) gave Burkina Faso funds to spread the idea throughout the country's densely populated central plateau. About 150 villages on the plateau now have stone lines with very positive results (IFAD, 1993). Sorghum yields on the plateau have risen by about 40 percent in fields with bunds (Anon. 1993).

Indigenous dryland agricultural experimentation in Niger

An agricultural communications project implemented in Niger by the Academy for Educational Development discovered that farmers carry out a wide variety of experiments and systematically exchange the results of their research. "There is incontrovertible evidence that, drawing upon their own resources, African farmers have always been and continue to be great agricultural innovators and experimenters. Sahelian farmers in particular must constantly cope with rapid climatological changes in order to survive. To do so, they require a continuing supply of locally adapted technologies. The assumption behind the Niger study was that farmers are dynamic actors in the process of meeting their needs. Indeed, there is some evidence that producers' propensity to experiment and innovate is greater in highly diversified and/or stressed environments where extension is poor or non-existent. Much can therefore be learned from farmers. The Nigerian Sahel served as a natural laboratory in which to observe and analyze their adaptive, adoptive, and communicative behavior" (McCorkle and McClure, 1994).

Hausa dryland agriculture in Nigeria

Highly innovative approaches by Hausa dryland farmers have been recorded recently by studies in Nigeria (Warren, 1992a; Phillips-Howard, 1993). Hausa farmers living on the Jos Plateau of central Nigeria have begun the regeneration of soils from wasteland produced from years of tin mining activities. Although these wasteland soils have been regarded as virtually impossible to regenerate, Hausa farmers have done so through the incorporation of processed garbage from the city of Jos as well as traditional fertilizers such as cattle-egret manure. Their efforts are most impressive with a wide variety of crops being produced on the rehabilitated soils. A farmer-to-farmer exchange of these new technologies is another important characteristic of this situation.

Water harvesting systems in India

Considering the amount of rainfall and soil type, the farmers in Andhra Pradesh State, India, have developed the following major types of water harvesting systems (Sanghi and Kerr, 1991):

1. Individual farm ponds for supplemental irrigation or percolation are observed in areas where rainfall is high (more than 750 mm per annum) and where the existing crops are highly sensitive to moisture stress at critical stages.

2. Community tanks for regular irrigation or percolation are mainly found in red soil areas under a wide range of rainfall conditions (500-1200 mm per annum). Tanks for percolation purposes are used primarily in areas with red soil with low to medium rainfall.
3. *Khadins* (earthen embankments across the gullies) for harvesting moisture in the root zone are observed in areas with very low rainfall (less than 500 mm per annum) and deep soils. This system recharges the root zone during the *khariff* season for raising a post rainy season crop under residual moisture as observed in Jaisalmer and Barmer districts of Rajasthan State.

Steep slope terraces in Cameroon

Farmers in the Mandara Mountains of Northern Cameroon practice an intricate system of indigenously developed terracing of steep slopes (Reij, 1991). They use household and animal wastes and crop residues for maintaining soil fertility. Manure is spread and worked into the soil, and crops are rotated and intercropped. Trees such as *Acacia albida* and *Khaya senegalensis* are grown on the terraces, with their leaves used as fodder.

Mixed cropping and intercropping in India

In Rayalaseema region of Andhra Pradesh State, India, mixed cropping of *ragi* (finger millet) with groundnuts, chillies, and cotton is practiced by farmers on thousands of hectares. If all these *khariff* sowings fail due to drought, safflower is sown as a *rabi* crop. On the other hand, in Telangana region of the same state, *jowar* (pearl millet) with red gram or green gram with cucumber is sown as mixed crops. If all these crops fail to germinate due to erratic monsoons, castor is raised in August as a late sequence crop (Venkataratnam, 1990). Hence, sequential as well as mixed cropping helps the resource-poor dryland farmers in managing risk situations and also in meeting their subsistence food needs (Rajasekaran, 1993).

Red gram and groundnuts are grown as intercrops in dryland areas of Tamil Nadu, Gujarat, and Andhra Pradesh states. This practice is well established due to their value as legumes, oilseeds, and fodder for livestock (Venkataratnam, 1990). Farmers in arid regions of northern

India sow *bajra* (pearl millet) utilizing the pre-monsoonal showers (Gupta, 1987). Grassia tribes of Gujarat State practice mixed cropping and strip-cropping to enable the different sizes of root length to reach the varied levels of ground water (Shankaran, 1988). Such drought mitigation strategies protect the mixed as well as strip crops from erratic monsoonal rains. Furthermore, these strategies also check soil erosion and maintain soil fertility.

Policy Interventions

It is clear from these case studies that indigenous knowledge systems are invaluable, diversified, and comprehensive, although this is not always the perception among outsiders (Thurston, 1992). In fact, these systems are often overlooked by western scientific research and development practitioners because of their oral nature (Warren, 1991a). In most instances, these knowledge systems have never been recorded systematically in written form, and hence they are not easily accessible to agricultural researchers, extension workers, and development practitioners (Warren and Rajasekaran, 1993). Hence, by recording these systems, outsiders can understand better the basis for decision-making within a given society. Furthermore, by comparing and contrasting indigenous knowledge systems with the scientific technologies generated through international and national-level research centres, it is possible to identify where exogenous technologies can be utilized to improve endogenous systems (Warren, 1987; Rajasekaran et al., 1991).

In many dryland projects, there is a gap between scientific knowledge and local knowledge. Dryland management specialists with formal scientific and economic training formulate technologies and policies according to their perceptions of the dryland management problems (Millington, 1992). It is important to understand that local farmers and pastoralists are equally concerned about dryland management, but at the same time have their own set of resource management priorities and limitations. Therefore, indigenous knowledge pertaining to local resource management, traditional soil and water conservation mechanisms should form the foundations for future dryland management initiatives and technological interventions.

Policy interventions in the years to come should give priorities to these threatened knowledge systems. The framework for incorporating indigenous knowledge systems into agricultural

research and extension organizations has been used as a basis for developing policy recommendations (Rajasekaran, 1993). The policy recommendations are discussed in the following sequential steps: (1) agro-ecological mapping; (2) recording indigenous dryland management practices; (3) identifying research-based dryland management technologies; (4) conducting farmer's experiments; and (5) disseminating farmer-evaluated dryland management technologies.

Agro-ecological mapping

Analysis of the agro-ecosystem of the villages should form the first step of the entire approach. This analysis provides an understanding of the village environment and its physical conditions (Chambers, 1990). Maps and transects are drawn in participatory ways with local persons in order to demarcate the agro-ecological zones. Transects provide an opportunity to characterize the study villages in terms of crops and livestock husbanded, land use patterns, watersheds, and soil types. Once the physical resources of the villages are clearly understood from the villagers' perspectives, the indigenous categorization of types of farmers uncovers the socio-cultural and economic variables used to distinguish locally important categories of producers. The identification of local organizations and associations is vital for understanding indigenous approaches to identifying, evaluating, and disseminating sustainable dryland management technologies.

Recording indigenous dryland management practices

Once the indigenous grouping of farmers is understood, the next step is to record the indigenous knowledge systems of a particular group of farmers with respect to dryland management. In other words, how does a group of farmers try to overcome or adapt to the dryland management problems using their own knowledge? The social scientist in coordination with respective disciplinary scientists should provide leadership for recording indigenous knowledge related to dryland management. One of the characteristic features of indigenous dryland management practices is that farmers often adopt new practices as a group rather than individually. Hence, recording the indigenous dryland management practices of various groups of farmers is important. For instance, farmers in lowlying areas of semi-arid regions of Tamil Nadu State, India, adopt the practice of direct sowing of rice in order to conserve water as a collective

activity (Rajasekaran, 1993). In another case, farmers who live in low rainfall areas of Andhra Pradesh State, India, jointly construct *khadins* (earthen embankments) to harvest rain water effectively (Sanghi and Kerr, 1991).

Therefore, interacting with indigenous associations is one of the appropriate methods to collect information on indigenous dryland management practices. Numerous methods are now available for recording indigenous knowledge systems (Warren and Rajasekaran, 1994). The group interaction method results in the identification of indigenous dryland management techniques adopted by the group along with their associated problems, traditional beliefs, socio-cultural and economic factors. Group interactions reveal how local perceptions and approaches to dryland management may differ from those of scientists as depicted in the following table (Sanghi and Kerr, 1991):

Table 1: Differing Perceptions of Dryland Management

Farmers' perceptions	Scientists perceptions
Bunding on field boundaries	Bunding on contour
Concentration on soil	Concentration on conservation
Short-and long term advantages	Long-term advantages
Small and gradual investment	Large and one-time investment
Reclamation of gully erosion	Stabilization of gully erosion

Sanghi and Kerr, 1991

Identifying research-based dryland management technologies

Identification of research-based dryland management technologies should form the next step of sustainable dryland management programmes. Since farmers and scientists each know and understand many things, but have little overlap between their domains of knowledge, farmer-scientist interaction should help both groups learn. Involving research-minded farmers while identifying research-based dryland management technologies is essential.

Selected research-minded farmers should be taken to nearby research stations where they are provided opportunities to observe various on-station dryland management technologies. They should also be encouraged to ask questions regarding the technologies with a particular reference to environmental adaptability, social acceptability, and cost involved. The International Centre for Tropical Agriculture (CIAT) has recently followed this strategy in order to allow farmers to select a contour barrier to prevent soil erosion (Anon. 1993). Such a participatory approach is a starting point for identifying self-regulating and sustainable dryland management technologies.

Facilitating farmer experimentation

Based on the available indigenous and research-based dryland management technologies, the farmer group should be encouraged to decide which one or combination of dryland management technologies they want to test. Research in Africa and India into adaptive responses to drought and famine suggests that farmers' experiments increase in number and complexity after crises (de Schilippe, 1956; Juma, 1987). Farmers may participate with researchers in conducting experiments of the following types: (1) A farmer group may be interested in incorporating indigenous and research-station based dryland management technologies; (2) Another farmer group may want to test an indigenous dryland management technique only; and (3) A third farmer group may want to evaluate a research station technique by suitably modifying it to their conditions. This interactive process enables farmers to obtain a basket of technologies rather than fixed packages.

During the experimentation, it is necessary that farmers should be encouraged to use their own evaluation criteria to assess the dryland management technologies. In addition to the

farmers' evaluation criteria, the following factors should be also be taken into consideration for evaluating the dryland management technologies during farmer experimentation: (1) compatibility with agro-ecological conditions; (2) compatibility with socio-cultural environments; (3) need for institutional support; (4) productivity (both land and labour); (5) profitability; (6) risks involved; (7) need for external resources; (8) need for institutional support (extension, credit, cooperatives); (9) ease of testing by farmers; and (10) labour intensity.

Disseminating farmer-evaluated dryland management technologies

The results of farmer experimentation should form the base-line for disseminating the dryland management technologies on a wider scale. During the process of disseminating farmer-evaluated dryland management technologies, the following socio-cultural, economic, and institutional factors should be taken into consideration:

1. Varying interests of farmer groups and the distribution of benefits among them need to be analyzed and addressed.
2. Although technical assistance may be needed to advise on the construction of sound soil and water conservation structures, farmers should give final approval of the design of structures in their own fields.
3. A major effort is needed to strengthen indigenous organizations. NGOs should work in cooperation with government programmes to strengthen farmer organizations so that they can facilitate implementation of farmer-evaluated dryland management programmes. This is an important prerequisite for developing an efficient system for financing soil and water conservation investments (Kerr, 1991). The strengthening of farmer organizations encourages local experimentation relevant to soil and water conservation programmes (Molnar, 1991).
4. Credit organizations should deal with farmer groups rather than with individual farmers (Kerr, 1991). This reduces the bank's administrative risks and costs. The farmer

(Kerr, 1991). This reduces the bank's administrative risks and costs. The farmer organization should be entitled to additional loans only after repayment, relying on group pressure to encourage repayment.

5. There should be a provision for incentives and awards for dryland management project authorities to implement farmer-evaluated cost-effective dryland management programmes. This will encourage innovativeness and high-quality work.

Conclusion

A number of top-down dryland management programmes have failed due to inappropriate methods and lack of understanding of the existing socio-cultural and economic conditions. Indigenous dryland management strategies evolved, modified, and adopted by local people are often sustainable in the complex agro-ecological, socio-cultural, and economic conditions of small-scale and marginal farmers and pastoralists of the developing world. However, these strategies are not easily accessible to dryland policy makers and scientists since they are not recorded in written form. Hence, future policies on dryland management should consider and incorporate these threatened knowledge systems. Identifying indigenous dryland management practices, incorporating indigenous and top-down dryland technologies, conducting farmer experiments, strengthening indigenous organizations, and disseminating farmer evaluated dryland management technologies are policy interventions towards achieving improved productivity and sustainability of dryland management programmes in developing countries.

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**THE ACTIVE METHOD OF PARTICIPATORY RESEARCH AND PLANNING
(MARP)
AS A NATURAL RESOURCE MANAGEMENT TOOL**

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Introduction

The promotion of community participation in natural resource management is currently a central concern for natural resource management projects. This is primarily due to the fact that the strategies implemented thus far have not been very effective, because of their essentially technological bias. The alarming scale of degradation of the economic production base in rural areas in Africa has rendered the implementation of long-term, viable natural resource management mechanisms all the more urgent. In addition, the resulting scarcity of exploitable resources (in particular, land) has made it harder to gain access to, and to manage, these resources. Attempts at regulation and management by government bodies have resulted in the destruction of traditional management mechanisms, thereby creating conflict situations which are often difficult to resolve.

Awareness of the present fragility of resources is very high within the village communities, which are endeavouring to implement more appropriate management models. Regrettably, these initiatives are not always taken into account and made use of in the definition of institutional

framework for the management of natural resources. It now seems to be increasingly accepted that the institutional natural resource management projects and programmes cannot hope to safeguard local resources in the long term, because of their own limited life time. Such guarantees can only be offered by permanent community structures, fully empowered to do so. But the big question remains: what can be done to promote the genuine participation of populations in natural resource management?.

To take the specific example of the Sahel, the village land management approach has been adopted by several natural resource management projects, because of the scale on which the village land management approach is applied. Village lands represent a more relevant and more manageable space to local people than the scale on which most major development projects are usually implemented. Consequently, the village land management approach has the potential to promote much wider participation by local people. The active method of participatory research and planning (Méthode Active de Recherche et de Planification Participative: MARP) currently offers a range of tools and techniques facilitating the village land management approach.

The Active Method of Participatory Research and Planning (MARP)

Definition of MARP:

MARP is a method of participatory research and planning using visual tools developed by the populations themselves. The use of these tools promotes development of the know-how of local populations and facilitates communication between the village community and technicians. The method is iterative, multidisciplinary and flexible. Where natural resource management is

concerned, MARP tools are increasingly being used by local people in planning and managing relevant programmes. MARP thus represents a method which aims to give such people the necessary tools for the implementation of community programmes. As such, its scope extends further than that of mere research. The tools used include:

Resource maps

Sociological maps

Matrix classifications

Venn diagrams

Flow charts

System charts

Seasonal calendars

Historical analyses

Analyses of the village land or transect

Classifications by level of wealth

The following are important principles of MARP:

Making use of local knowledge

One of the important methodological principles of MARP is the use of the knowledge of local populations. The process draws on the actual experience of the populations themselves. Where natural resource management is concerned, increased efforts by projects to take into consideration the knowledge gathered by local populations could offer an important shortcut in

the elaboration and implementation of more appropriate natural resource management programmes. In addition, experience has shown that use of MARP in the participatory planning of natural resources can lead to a much greater harnessing of local knowledge.

Three-pronged approach

The participatory planning process includes research. An essential issue in any research process, participatory or otherwise, is the reliability of the instruments and, by extension, the validity of the results achieved at the end of the process. One constant concern in the application of MARP is to ensure that the short time spent in the field does not constitute a factor affecting the quality of the results. It is therefore essential that work-time should be rationally managed, and the principle of "optimal ignorance" dictates that the work-time should be devoted to acquiring knowledge of direct relevance to the objectives of the study. Only too often research projects approach local people to obtain information that will be only partially used, if at all.

The three prongs of the approach are:

- (a) Multidisciplinarity, which makes it possible to analyse the phenomena being studied from different points of view, giving a better reflection of the very complex realities of rural life;
- (b) Diversification of tools and techniques, so that different units of measure are used for each phenomenon being studied. This form of blending definitely enhances the quality of the information obtained;

- (c) Diversification of information sources, in order to avoid a sectoral view of reality. In addition, certain biases inherent in different social groups can either be eliminated or at least reduced.

Role reversal

MARP is based on a new paradigm of development, one of the bases of which is that technicians must change their attitude. This change in attitude must be manifested through role reversal. This means that, in the MARP process, local people are now analysts and presenters of their own situations while the technicians play the role of catalysts and facilitators. This process of change can sometimes be rather difficult since it requires technicians to surrender some of their powers to local people. Hence it can never be stated too often that MARP is designed not for the technicians but for the local people themselves. For this reason, training of the technicians should be considered as nothing more than an interim stage in the transfer of tools and techniques to grassroots communities.

Iteration

MARP is an interactive learning process and not merely a data collection exercise. This makes the process rather complex but, at the same time, facilitates utilisation of the skills of those participating in the process.

Strengths of MARP

MARP helps local people to analyse their own situations. Experiments in the use of MARP in the field demonstrate the great facility with which people use usual tools and techniques as aids in analysing situations of direct relevance to themselves.

Visualization facilitates the transfer to local people of research findings. In most village communities, illiteracy impedes the use of written information. With MARP it is much easier for a population to apply the results, since the process relies on visual aids developed by the people themselves and relating to local situations.

Visualization considerably reduces the marginalization of certain groups in the analysis process. A number of examples gathered across Africa demonstrate the great strength of MARP tools as aids facilitating the participation by certain traditionally marginalized groups in the planning and implementation of various actions. While generalizations should be avoided, it has nonetheless been noted that the process itself was so exciting that, by the end, it had engaged the attention of all groups. One thing should be stressed, however: the importance of ensuring that the participation of these groups in joint discussion exercises is matched with their participation in the decision-making process.

Visualization facilitates communication between local people and technicians. It is now generally accepted by their users that MARP tools are equally effective aids for communication and extension work. The potential of MARP as an aid for rural extension work has still not been fully explored.

Potential dangers of MARP

Too popular, too soon!

The rapid spread of MARP also represents a fairly sizeable risk. The demand for support generally exceeds the response capacity of the qualified staff available. The usual consequence of this is that institutions apply the approach without making the necessary methodological preparations. In fact, the apparent flexibility of MARP also makes it a very demanding method at both the intellectual and physical levels. MARP produces bad results when it is badly used. This problem currently represents one of the most serious threats for the development of MARP.

Expectations aroused

MARP arouses high expectations with local populations. The practical process is so exciting and so catches the attention of local populations that they invariably - and with good reason - expect that its results will provide the basis for future field action. For this reason, MARP must always be linked to ongoing programmes or actions in the field. Unfortunately, their failure properly to grasp the end-purpose of this method leads certain users to give pride of place to the research itself. The frustration caused thereby can undermine the interest which populations might otherwise take in the method.

Extractive use

MARP is, first and foremost, a planning tool designed for the populations themselves. But there is currently a pronounced tendency to turn MARP into a mere research method. This creates the danger that the method will become distorted since the participation of populations will be of more benefit to some outside institution or individual.

MARP as cure-all

Inadequate understanding of MARP is likely to turn it into an alternative method which excludes all others. MARP works in certain contexts and not in others. Some organisations see MARP as a miracle method which offers a remedy for any difficulty encountered in the field. A method is only as good as the use to which it is put, however; tools are nothing more or less than the means to an end. Consequently, the method should not be isolated from other methods and approaches, whose possible complementarity with MARP should be wisely exploited.

Lack of monitoring

The rapid development of this method makes it difficult to devise any mechanism to monitor the use of its tools. If the potentially disastrous consequences of the cumulative effects of incorrect use are to be avoided, the various experiments must be regularly and thoroughly monitored. Unfortunately, this requirement does not seem to have been properly appreciated by all MARP users. One major constraint in dealing with this problem is that no institution can claim the right to exercise this function, still less impose any standard of reference. This undoubtedly increases

the risk of the method being used incorrectly.

Village Land Management

In the specific context of the Sahel, the main instrument for natural resource management at the local level is the village land management approach ("approche gestion de terroirs villageois"). This approach earned its credentials in the late 1970s. **It can be defined as the total set of institutional and organisational mechanisms implemented by a given community or group of communities with a view to the sound and sustainable management of the natural resources within an area which they consider to be theirs.**

The methodological and practical attraction of this approach consists in its departure from the official systems for the management of village land based on spatial demarcations which do not necessarily correspond to areas relevant to local communities. The village land represents a territory which local communities can control more easily, particularly in the implementation of natural resource management programmes. It could be argued, therefore, that the village land management approach is potentially conducive to increased participation by local people provided the systems set in place recognize their right to control local resources.

The village land management approach combines the planning and the management of local resources. Its implementation comprises the following basic stages:

- discussion and diagnosis with a view to identifying problems related to the management of resources

- establishment of a local organisation for the management of local resources

- demarcation of the village land

- elaboration of a management plan, based on zoning and co-ordinated with the local organisation entrusted with management of the resources

- implementation of the plan

- monitoring and evaluation of the plan

- report

Why link village land management and MARP?

Although the implementation stages of this approach have been clearly identified, it is still hampered by methodological constraints caused by the lack of specific tools and techniques for its application. This largely explains why different institutions currently involved in village land management use different methods for its application. Methodological analysis and practical experiments involving the possible linking of village land management and MARP are among the efforts made to fill this void. Experience gathered elsewhere (in particular, Asia) demonstrates the usefulness of MARP tools as aids in the implementation of community planning and management programmes for natural resources. In India, for example, patient and carefully planned efforts by certain local non-governmental organisations have enabled some village

communities to make independent use of the MARP process in defining and implementing programmes for the management of their village lands.

At the same time, the village land management approach, as currently implemented, still has certain limits:

1. The village land management approach takes a restrictive view of village land, which it considers as a finite spatial entity. In fact, it is well known that, in reality, the boundaries of African agro-systems are very fluid. Several village lands can overlap, resulting in highly complex management mechanisms. In the Sahel in particular, it has been noted that desertification has considerably changed traditional natural resource management practices. Neighbouring communities are increasingly pooling their natural resources and developing intercommunal management mechanisms which are better adapted to the new environmental conditions. When MARP is applied to village land management, the use of its tools and techniques should be adapted to these realities, which, fortunately, can be analysed using various MARP techniques.

2. Village land management programmes take insufficient account of the needs of certain groups, whose activities are not confined within a given area. Such is the case, in particular, with pastoralists. This often leads to the exacerbation of conflicts involving access to certain key resources. Efforts must be made to refine the methodology so that MARP can be more effectively applied to the realities of pastoral life. In certain cases, new ground must be broken to find new tools.

3. Current legislation on the management of natural resources is often in conflict with the spirit of the village land management approach. The participation required from local populations is only possible and justified to the extent that these population have a certain measure of control over local resources and are given assurances that they will have equal control over the use to which the results of their efforts are put.

4. Certain projects seem not to be interested in linking implementation at the village land level to an overall development plan. The village land is not an isolated entity, however, and both economic policies and the immediate socio-economic environment influence local processes. Consequently, it is important to "think globally and act locally".

5. From looking at village land management projects, it is clear that in many of them participation by the local people is more a means than an end. The aim is usually to generate community participation in order to ensure the success of the activities under way, even though the overall programme being implemented may not give any indication of how skills and powers are actually going to be transferred to the community. When participation is only a means to an end, its long term viability will depend on the continuance of the activities that brought it about in the first place. There is a risk that participation will end with these activities.

Possible applications of certain MARP tools in natural resource management

Resource maps

The resource map is an effective tool for making inventories of resources. Maps drawn up by

local populations may be very detailed and go beyond inventorizing available resources, providing a basis for the zoning of village land. This tool can also lead to a better understanding of the modalities by which land is appropriated and the rules governing its circulation among members of the community. The resource map therefore represents a useful tool both for planning and for management.

Analysis of the village land or transect

This supplements the resource map and adds participatory observation to the process of visualization. With the use of this tool, the multidisciplinary team (composed either of technicians and villagers or exclusively of villagers) can better appreciate visualized elements in the resource map drawn up by the villagers.

Sociological map

This is a useful and effective tool of inventorization and classification. In resource management it can be used to classify the different activities or groups in accordance with their level of access to land resources; it also gives information about the availability and state of the resources. In this way, it constitutes an important decision-making tool in the area of land management.

Venn diagram

The Venn diagram gives information about the traditional or modern institutions involved in the

management of local resources. It also sheds light on the impact of these different structures as perceived by the local people and the ways they are interrelated. In the planning of natural resource management activities, the Venn diagram is useful for analysing the roles to be played by the different institutions.

Flow charts

The range of MARP tools has been expanded with the addition of flow charts describing land-tenure relationships. These usefully supplement the Venn diagram by giving more detailed information about the relationships between a given community and its environment (the lending or borrowing of land, land-tenure conflicts, co-management of resources, etc.). This tool is of vital importance, since some institutional models for the management of village land are vitiated by an assumption - usually mistaken - that village land has fixed limits.

System charts

System charts demonstrate the great intricacy of land-tenure systems in Africa. Thanks to the constant methodological refinement of these charts, the operation of land-tenure systems is now much better understood. They are highly analytical tools.

Seasonal analyses

Seasonal analyses show the fluctuations that occur within a given year or over the course of several years. When applied to the use of labour over the course of a year, they help identify

the extent of pressure on the labour force at certain times of the year, so that village land management activities can be more better programmed.

An entire range of tools for analysis and historical trends enable local populations to look back at previous practices and see to what extent these practices have been responsible for their present situation. Such trend analyses enable people to make forecasts about the "possible future". The importance of such a tool in programmes for the planning of natural resources is self-evident.

Preconditions

The long term viability of MARP as a village land management tool depends on a number of preconditions, including:

An organisational base

The adoption of MARP tools for use in the community planning and management of local natural resources is contingent upon the existence at the local level of an organisation capable of providing support for the community in the process of transferring and institutionalizing MARP.

Political will of the support bodies

This new system depends on the willingness of support bodies and government institutions to

transfer powers to grassroots organisations. Hence the importance of going beyond mere declarations of intent and of making concerted efforts to devolve power. Where natural resource management is concerned, this should be manifested in a more explicit recognition of the rights of ownership of local communities over the available natural resources.

The existence of community natural resource management programmes

MARP cannot develop from nothing. Its tools are only of value to the community when their use is co-ordinated with development activities already under way and leads to the improved management and strengthened control of resources by local people. Participatory planning and management of local resources is only possible in the context of a coherent development programme. For this reason, while communities may be expected to be able to finance their own development, support from non-governmental organisations and natural resource management projects is still needed. The terms and conditions of partnership should, however, be made very clear, with the external agency relegated to the role of a mere catalyst, so that local potential in the area of participatory management is not stifled.

The implementation of a monitoring system

Mastering MARP as a resource management method is a long process. A monitoring system is therefore essential to ensure that the transfer mechanism guarantees a high level of quality in the use of its tools. Monitoring is perhaps the most critical aspect in the current development of MARP.

Conclusion

Despite the potential offered by MARP as a tool in the implementation of a village land management approach, much careful analytical work remains to be done to identify any obstacles to such a link. For example, with regard to training of farmers' organisations, the search for appropriate teaching aids remains a central concern in efforts to facilitate the transfer of tools and techniques. The viability of this method will, however, depend to a large extent on the ability of government institutions to strengthen the powers of local communities in controlling and managing local resources.

NATURAL RESOURCE MANAGEMENT¹
IN PASTORAL AFRICA

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Current research on rangeland ecology suggests that we have less to fear from pastoral land stewardship than was previously thought. On the one hand, the natural environments exploited by pastoralists are generally robust and resilient. And on the other hand, pastoral techniques of land management are not as dysfunctional as was once widely assumed. While regulation of pastoral activity may be necessary in specific circumstances, there no longer exists a broad scientific mandate to control or modify almost every aspect of pastoral land use in order to preserve the environment.

This short note tries to do two things. First, it attempts to justify in some small measure the assertions made in the previous paragraph. Then it examines the fundamental adjustments in natural resource management policy which would be required if these assertions were substantially true.

The resilience of Africa's rangelands

In the highly 'pulsed' environments which concern us here, there are marked seasonal and inter-annual fluctuations between wet and dry periods. During the wet seasons/periods when the vegetation is growing it is vulnerable to damage by herbivores, but it also tends to be in considerable surplus to their feed requirements. Conversely, when grazing pressure is high -i.e. in dry seasons or during droughts when demand for feed far outstrips supply - the plants tend to be relatively impervious to abuse, the living bits having retreated behind thorns, inside woody structures, below ground or been stored in seeds.

① In sum, in these very harsh and erratic climates, the plants are relatively well adapted to high grazing pressure during dry periods of forage scarcity. And dry periods are frequent enough and severe enough that it is difficult to maintain domestic herbivore populations of sufficient size to challenge the vegetation when it is growing and vulnerable. These are ecological systems with a considerable capacity to absorb perturbation.

If this is true, policy concerns about overstocking and desertification may be justified in particular instances, but these phenomena are not general enough to provide a framework for the formulation of natural resource management policy as a whole. A more worthy focus of policy attention are the peculiar problems of pastoralists who have to make a living in dry and drought-prone environments. These problems are examined in the next section, which compares resource management and exploitation in erratic or 'non-equilibrium' versus stable or 'equilibrium' rangeland settings.

Management in equilibrium and non-equilibrium grazing systems

Equilibrium grazing systems are characterized by relatively high levels of climatic stability resulting in constant levels of primary production. Provided with a reliable feed supply, livestock populations in these settings can expand to the point where they have a considerable impact on the vegetation, both in terms of its species composition and density.

Conventional range management makes sense in this kind of grazing system. Livestock make spaces either by eating or stepping on plants; plant succession tends to fill these spaces back in. Range management seeks to balance these space creating and filling processes, by adjusting the destructive power, and hence the number, of animals to match the recuperative power of the plants, thereby sustaining a stable and profitable equilibrium. In this model 'fine tuning' for optimal output is possible because livestock renew themselves - reproduce, grow and produce meat and milk - at a rate determined by the availability of their feed, which is an inverse function of their density. Changes in stocking density therefore yield predictable alterations in output and revenue.

Implicit in this model is the assumption that managers are able to exercise considerable control over future biological states of the grazing system. They are able to do this because the variables which drive the system are biological components of the system itself and are susceptible to human control at relatively low cost. This is an appealing message for commercial ranchers who occupy marginal land which is incapable of generating the revenue to sustain ambitious capital investments or the intensive employment of labour. However modest their profit margins, here is one 'management' operation which every rancher should be able to

afford - the harvesting for sale of animals from his herd. Conventional range management invites the manager to transform this simple profit-taking operation into a sophisticated management tool, by setting a culling rate which will leave behind an optimal number of animals.

But what happens when it doesn't rain, or more precisely, what happens in areas where rainfall is persistently erratic both in timing and spatial distribution, the so-called non-equilibrium environments of arid and semi-arid Africa?

In a grazing system subjected to extremely variable rainfall, fluctuations in rainfall may have a much stronger effect on the vegetation than animal numbers. Productivity levels will therefore be determined by abiotic perturbations which the manager is unlikely to be able to predict and will, almost certainly, be unable to control. In these environments it is no longer appropriate to conceive of management as the manipulation of the biological system to achieve maximum output or revenue. Such manipulation is not possible because the critical variables which drive the system are not susceptible to control; moreover, extreme fluctuations in output and revenue - not the imprecision with which these values are maximized - are the primary causes of distress for dependent human populations.

Ecology and resource tenure

In an equilibrium grazing system it can be quite useful for a single decision-maker to control all the animals in a delimited area. This level of control permits managers to make precise adjustments in livestock numbers and, in most situations, equates an owner's self-interest with

the maintenance of an appropriate long-term stocking rate. Restrictions on herd movement present no insuperable difficulties as long as the supply of feed produced within an area is relatively constant, predictable and susceptible to manipulation by adjusting the stocking rate.

New considerations obtain, however, as the climate becomes more erratic and the manager discovers that he cannot manipulate his forage supplies, but is manipulated by them. The basic problem may remain the same - that of matching feed supply and demand - but it manifests itself very differently. In the equilibrium setting, the challenge was to maintain a long-term balance by making almost continuous minor adjustments to livestock numbers. In the non-equilibrium setting, the problem is to react quickly or to 'track' unpredictable, dramatic but short-term fluctuations in feed supply. One effective tracking strategy is to move animals around, avoiding areas where forage is insufficient and mopping up surpluses in areas where it is abundant. 2

Pastoralists living in a very unstable environment will, therefore, derive little advantage from having unquestioned control over a sporadically productive stretch of territory; more advantageous would be the option to use alternative areas, should these areas be capable of sustaining their livestock when their home territory is not. But options on another person's property will, in all probability, mean that they have a reciprocal lien on one's own property. This *quid pro quo* exchange of use rights is the basis for the non-exclusive tenure and land use regimes characteristic of pastoral Africa.

The inversion of our expectations regarding responsible resource management could not, in some respects, be more complete than it is in pastoral Africa. Whereas freehold ranchers may be forced to prudently adjust livestock numbers to their land base, pastoralists tend to reverse

this equation. Faced with large and unpredictable fluctuations in resource productivity, they seek to lay claim to the natural resources which are needed to sustain their stock. They fiddle their tenure system rather than their herd size, thereby escaping the 'salutary' discipline of freehold tenure, that certain knowledge that they must live and operate within a rigidly delimited and finite land base.

Economic theorists, planners and professional range managers all find this rather disturbing. The setting of rigid ranch boundaries and the unequivocal identification of ranch members were both a persistent concern for designers and a persistent problem for implementers of the older generation of group ranches (Perrier, 1983 and 1990; Devitt, 1982). Things have not changed much in the intervening years; current research on common property resource management endorses precisely these concerns. Both theoretical (Runge, 1986) and empirical studies (Ostrom, 1990) indicate that the unambiguous identification of a delimited group with a bounded resource is a critical ingredient in the success of collective resource management. What is required for effective management, this work suggests, is not necessarily private tenure or an individual manager, but rather exclusive tenure (even if rights are exclusively owned by a group) and a single decision-making body (which may be corporate).

These conditions for successful group management cannot be met on any widespread basis in dry Africa. 'Fuzzy' or indeterminate group and territorial boundaries are not an inadvertent feature of pastoral tenure, or simply a residue of a time when population densities were low and the precise definition of property and property holding groups was unnecessary. In an unpredictable environment, certain critical ambiguities as to who owns what and can go where provide a degree of fluidity which suits everyone's requirements.

Some practical suggestions

So, you may say, we now have a better understanding of how pastoral resource management systems work. But are we any closer to understanding how we - as external agents of development - should intervene in these systems?

There follow a few points for debate:

1. The per hectare productivity of Africa's arid and semi-arid rangelands is low; so must be the cost of their management, if management is to be sustainable in the sense of generating improvements in production which equal or exceed the costs of management. Modest expectations are in order.
2. In a difficult and complex environment, the energetic administrator is constantly tempted to overstep the economic limits of appropriate administrative endeavour by managing at an unaffordable level of intrusiveness, precision and intensity. For this reason it is quite unlikely that we will discover suitable models of pastoral administration by examining livestock and range development projects funded by donor agencies. Indeed, these projects may have fundamentally distorted our expectations of what pastoral resource management can achieve on a continuous basis, and the resources which are likely to be routinely available.

A more realistic framework for sustainable management effort is provided by the typical district-level bureaucracy in dry Africa - the colonial district commissioner or his independent counterpart, and their local subordinates - beset by a plethora of problems which demand

attention, constrained by inadequate staff, limited funds, poor communications and transport, and encumbered by superiors at headquarters who are only sporadically concerned with local affairs. Set resource management objectives which are consonant with the capacities of these officers and we will, in all probability, be working within realistic limits.

3. Not much administrative intervention in resource management is feasible within the constraints laid down here. If the landscape is to be managed at all, then individual pastoralists and pastoral communities will have to do it, as they have in the past. If these local users are to manage responsibly, then they must be given legal rights to control the resources they are managing. This requires governments to relinquish *de jure* control over rangeland resources; control which in any case was effectively beyond their grasp. In relinquishing this control administrators and donors can be reassured that, as was noted at the outset, we now have less to fear from pastoral land stewardship than was once assumed.

4. Since regulatory aspirations are unrealistic and unnecessary, administrative emphasis should shift from regulating resource use to allocating and upholding access rights. Administrators/managers can usefully arbitrate between the conflicting interests of opposed groups and individuals. The need for such mediation will be fairly constant in an erratic environment in which resource productivity, people and animals are continually rearranged in space, and land use issues cannot be sorted out once and for all. Indeed, the arbitration of chronic conflict over scarce resources may be the central natural resource management function of local government officials in a non-equilibrium setting.

Given the limited means at their disposal, government officials probably can only afford to

make management decisions at the margins, when the ownership and use of a particular resource hangs in the balance between contesting parties, and the administrator can expect to exercise a degree of influence which is disproportionate to his real power. It is at this modest level - with the ability to influence but not to dictate land holding patterns and management practices - that the typical district official must learn to operate.

5. Continuous official involvement in arbitrating land tenure disputes effectively sidesteps the problem of how to transform customary land rights into formal law. Pastoral tenure regimes exhibit a level of complexity and internal variability which is virtually impossible to simplify into legal formulae. Even if it was initially accurate, such codification would soon be out of date, as customary usages change in response to demographic pressure, new economic interests, or shifting political alignments. The essence of customary tenure is its fluidity, and this facet of customary usage cannot be captured in law by simply writing down existing oral agreements.

One solution to this impasse is for government authorities to promulgate and subsequently enforce procedural rather than substantive land law (Vedeld, 1993). Rather than legislatively dictating the content of property rights, procedural law would specify the framework within which interested parties could legitimately put forward alternative claims to resources, what administrative/jural institutions should process claims, the criteria for choosing between opposing claims and enforcement procedures.

Donor support for the development of procedural law would imply the renunciation of any attempt to dictate the kind of tenure system - individual or communal - which was appropriate in a particular locality.

6. And where, literally, should the authorities begin their management activities? With 'key' resources - the natural resource bottlenecks, the scarce natural production factors which limit livestock output by controlling stock numbers or productivity during the most difficult periods in the production cycle. Which natural resource were key or limiting within particular production systems could be determined by applied research, or by simply observing which resources occasioned chronic conflict and dispute.

Focusing on certain resources means ignoring others. In focal point management the intensity of management activity, investment levels and the precision with which access rights are specified would be intentionally adjusted to reflect the value of the resource being managed. In contrast to the freehold model of individual or group ranch tenure, focal point management would concentrate development efforts on a particular category of resources, rather than the delineation and management of bounded territories containing a variety of different resources. In essence, focal point management would concentrate management attention on these resources which lay at the heart of the production system, and devote much less effort to the clarification of rights to resources which were very abundant, of low or erratic productivity, or geographically extensive and difficult to police.

The concentrated deployment of management effort offers several advantages. Most importantly, it would insure that government's scarce financial resources were expended where they were most needed, on the management of resources which were in high demand, were likely to be a source of conflict between different groups of users, and - if left unmanaged - could precipitate disputes which threaten public security. Producers who controlled key natural resources would possess a resource base which permitted them to exploit more peripheral

resources and exercise *de facto* control over these resources. Thus, through the allocation of critical nodes on the landscape, administrators could expect to exercise some indirect influence over levels of resource exploitation throughout an area or region. Finally, by de-emphasizing the need for strict boundary maintenance, focal point management would permit the continuation of customary tenure arrangements which encourage the shared use of resources which are not in high demand.

Notes

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**ENVIRONMENTAL DEGRADATION AND PUBLIC POLICY IN
LATIN AMERICA**

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Introduction

Latin America is a continent with high geographical, biological and cultural diversity. It has several mountain massifs like the Andes, the Planalto of Mato Grosso, and the Sierra Madre; dense rain forests such as the Amazon, the Choco and the Peten; large savannas in South America, and important arid and semi-arid regions in Mexico, Brazil, and the Pacific Coast of Chile, Peru and Ecuador. Its biodiversity is among the highest on Earth; several "hot spots" of biological diversity have been identified, particularly in the tropical regions of Central and South America: the Amazon region alone probably has over 5,000 species of plants, 950 bird species, 200 mammal species, 300 reptile species and a similar number of amphibians, between 2,000 and 3,000 species of fish, and millions of insect species (Goulding, 1993). The socio-cultural diversity is illustrated by over 450 indigenous languages, belonging to a similar number of Amerindian cultures are still spoken in the continent, in addition to the official European languages of Spanish, Portuguese, English, French, and Dutch. Latin American culture has benefitted from Amerindian, European and African influences.

In contrast to its high environmental and socio-cultural diversity, Latin America presents some common problems of environmental deterioration and rather monolithic public policy approaches to solve the problems. This paper, thus, deals with the declining quality of Latin America's physical and social surroundings and with governmental decisions that have contributed to it. It also analyzes some public policy trends which would have beneficial consequences for the environment in the future.

Environmental Degradation

While Latin America still has large extensions of its area, such as parts of the high Andean plateaus and the Amazon region, in a relative pristine state, over the years there has been a process of degradation which is obvious. The degradation--defined as a loss of natural habitat--of Latin America has manifested itself in several forms, including deforestation, soil erosion, air and water contamination, reduced water catchment, drought and desertification, flooding, mineral depletion, and reduced carbon sequestration.

Along with the destruction of the physical environment, the socio-economic conditions of the continent have also deteriorated to the point that, in 1990, per capita consumption in most countries was less than in 1980 and more people were suffering absolute poverty in 1990 than in 1980 (O'Brien, 1991:25). These conditions are the effect of processes of environmental degradation (Mahar, 1989; DeWalt et al., 1993) and have undoubtedly contributed to it because they have forced people to over-exploit nature, regardless of the consequences (Mink, 1993; Baena Soares, 1992).

Poverty is widespread in Latin America and affects urban as well as rural populations. However, analysis of the existing data shows that in some countries it affects more indigenous than non-indigenous peoples. For instance, indigenous peoples, who represent the highest proportion of rural population and significant proportions of urban population in Bolivia, Ecuador, Guatemala, Mexico and Peru, are predominantly poor, due largely to an unequal distribution of resources in society, both in terms of income as well as in terms of access to basic social services such as health, education and housing. In Bolivia and Peru, where over half of the population is poor, between two thirds and three fourths of poor people are indigenous. In Guatemala, 66 per cent of the population is poor, but 87 per cent of the indigenous peoples are under the level of poverty (Psacharopoulos and Patrinos, 1993).

Some aspects of environmental degradation have been estimated thanks to modern technology such as satellite images, radar and aerial photography. Others are harder to estimate at the regional level. Nevertheless, **deforestation** is one of the main forms of environmental deterioration. In Latin America, which has 27 per cent of the Earth's forest cover (Browder, 1991: 45), between 1981 and 1985 there was an annual loss of tropical forest cover of 5.6 million hectares, representing 0.6 per cent of the remaining closed and open forest at that time, according to a study by the United Nations Food and Agriculture Organization (cited by Keipi, 1991: 39).

Tropical forests in Central America and the Caribbean have almost disappeared. But, in addition, the largest repository of tropical life on Earth, the Amazon, is also being deforested at fast rates. By 1990, between six and 7 per cent of its forests had already been cleared (Fearnside 1989). In Brazil, where the largest part of the Amazon region lies, deforestation of

the so called "Legal Amazon" has accelerated sharply since the mid-1970s; in 1988 the deforested area was about 600,000 square kilometers and the total area cleared up to that year was over 5 million hectares, largely due to the expansion of cattle ranching (Mahar, 1989). Likewise, deforestation of the Colombian Amazon has varied between 600,000 and 880,000 hectares annually (Bunyard, 1989); the rate of deforestation of the Peruvian Amazon for the 1981-1985 period has been estimated at 270,000 ha per year, much of it due to the expansion of coca plantations (Bedoya and Klein, 1992); and, at the present, the rate of deforestation of the Ecuadorian Amazon is over 100,000 hectares per year.

Mexico provides an illustration of the deterioration of forests and other natural resources. In this country 60 per cent of the rivers are seriously contaminated; the salinisation of soils due to inappropriate irrigation models has reduced crop output by the equivalent of one million tonnes of grain a year, and wastewaters from urban runoff are threatening rich and complex coastal ecosystems. Likewise, about one-half of Mexico's land shows moderate to advanced erosion, and about one fifth has already been destroyed (Goldrich and Carruthers, 1992:102-103).

Soil fertility is being seriously reduced in most of the continent. To start with, 81 per cent of the soils are acidic and low in nutrients--as compared with 56 per cent of Africa's and 38 per cent of Asia's (Moran 1987:70). Adding to this, **erosion** is affecting the mountain slopes of the Andes, the highland valleys of Central America and Mexico and other fragile lands in the Amazon. Data on the amount of erosion is wanting, but one study in Honduras estimates that in the Upper Choluteca Watershed as much as 13 tonnes/ha/year are lost to erosion (DeWalt, et al., 1993).

Land degradation and soil erosion as well as the severe impoverishment of the peasantry has been attributed to a model of "disarticulated capitalism" which has led peasants to increase the exploitation of their resource base as a survival strategy (Faber, 1992a:6-7). In more specific cases, settler impoverishment and environmental destruction in the lowlands of Bolivia are the products of "unequal exchange relations" between the settlement area and the larger society (Painter, 1987:165). This phenomenon has been also described as the "simple reproduction squeeze," by which local populations, like the frontier people of Rondonia in the Brazilian Amazon, are forced to reduce household consumption and/or intensify commodity production to maintain a minimum subsistence level (Millikan, 1991).

Deforestation, like other forms of destruction of the physical surroundings, is attributed to many causes, among them, population growth, poverty, unsecured land tenure, lack of technical and environmental awareness, lack of financing for small farmers, and debt (Tulchin, 1991; Mink, 1993). Most authors also stress that one of the main causes is public policy (Keipi, 1991; Browder, 1991; Southgate, 1990). Even though worldwide the depletion of about 150,000 square kilometers has been attributed to small scale agriculture, Mahar (1989) points out that the small farmer is not the cause but the victim of deforestation. The real causes are likely to be poverty, unequal land distribution, low agricultural productivity, rapid population growth, and misguided public policies.

Public Policy

Broad development policies

Public policy is here defined as the formally stated way to achieve the objectives set by a national, regional, or local government. It is useful to distinguish between policy which has indirect implications for the environment and that which is directly related to the environment.

Up to recent times there have not been environmental policies per se in Latin America, but instead policies that have had strong environmental implications. At the most general level, consideration needs to be given to the adoption of a given model of economic development or modernization, which has led countries to adopt some specific development objectives and strategies to achieve them. As differentiated models of development we have:

- agro-exports, based on a plantation economy
- import substitution industrialization
- export oriented mining, agriculture and manufacturing

Much of the land clearing in Central America is attributed to the rise of agro-exports based on a plantation economy. First, banana and coffee in the 1950s; then, cotton and sugar in the 1960s; and beef cattle since the 1970s. The production of these commodities has generally been stimulated by international lending institutions and by development policies of modernization, economic diversification, and expansion of capitalist agriculture and industry. They have flourished at the expense of large areas of tropical forest in the lowlands. Central America's

rain forest, one of the main reserves of biodiversity on Earth, has been disappearing at the rate of 3,500 to 4,000 square kilometers annually. Over one-fifth of land in the region is now under permanent pasture, representing more land than that dedicated to all other agricultural commodities (Faber, 1992b).

Of all the activities characteristic of a plantation economy, coffee processing has had the most serious effects on the degradation of water. For instance, in Costa Rica, the coffee *beneficios* have produced 66 per cent of the water contaminants, including boron, chloride, and arsenic (Faber, 1992b:22).

The import substitution industrialization model of development, by favouring the manufacturing sector and the urban areas, also had some negative consequences for rural people and the countryside. The policies that promoted cheap food and labour induced a decapitalization of the rural sector, particularly of the peasantry. In an effort to maintain their incomes, some people had to produce more, either by expanding the land area or by over-exploitation of natural resources rather than improving the technology of production.

Currently, in Latin America, there are remnants of old models of development, but the trend is to promote exports in the context of an increasingly deregularized, more competitive international commerce. Its environmental effects cannot be fully anticipated, but there still exists a situation in which,

"Developing countries of the hemisphere have confronted the need to use their natural resources in an indiscriminate manner in order to adapt to the demand of the developed

countries for raw materials and primary goods, which have historically been their main exports." (Baena Soares, 1992).

The environmental costs of economic development have not been taken into account either by market economies nor by those which adopted centralized planning. In fact, in the market oriented economies of Latin America, "nature" has been a factor of production and almost no attention has been paid to waste and pollution (Faber, 1992a:5). The model of development followed by Latin American countries in the past, under the assumption that natural capital is infinite, has generated impoverishment, heavy migration from rural to urban areas, pressures on land use that have resulted in over-utilization and extractive exploitation of natural resources (Muñoz, 1992:7).

Export production has particularly contributed to environmental loss by favoring internal processes of capital accumulation by a wealthy few based on the exploitation of natural resources. These people are usually not accountable for the social or environmental consequences of their actions; meanwhile, large numbers of people are denied or have only limited access to those resources have no option but to over-exploit the few resources at hand.

Sector specific policies

As strategies associated with one or more of the development models adopted and with strong environmental implications we have several more specific policies, among them:

- agrarian reform and colonisation

- agricultural modernisation

These strategies involve policies that cannot always be desegregated. Usually they are interrelated and have a combined effect on the environment. Thus, policies which lead to government intervention in markets for agriculture and natural resource commodities, to inappropriate tenurial arrangements and inadequate investment in research and extension have contributed to tropical deforestation, soil erosion and the disturbance of coastal ecosystems in countries like Ecuador (Southgate and Whitaker, 1992).

In many instances, Latin American governments have adopted policies favouring deforestation. Southgate (1990) points out four institutional incentives for deforestation: (1) open access, leading to waste and misuse of forest resources; (2) deforestation as a requisite for land tenure; (3) tenure insecurity; and (4) the demise of common property regimes.

In the 1960s, modernization efforts led to the adoption of agrarian reform and colonization policies. They promoted redistribution of land and labour by breaking up large estates, particularly the hacienda system. Some of the excess rural population was then routed to the growing urban centres and the rest to frontier areas, usually to rain forests in the lowland tropics that had previously been relatively undisturbed.

Instead of promoting the intensification of agriculture (higher yields through improved management of areas already under cultivation), governmental policies have often relied on frontier expansion or land extensification (Billsborrow and Ogendo, 1992) as a means of obtaining greater agricultural output.

In the majority of Amazonian countries, public policies also contributed directly to deforestation by promoting the clearing of tree cover as a condition to legal tenure and by a series of tax exemptions and credit incentives for pastures for cattle ranching and perennials and short cycle crops (Uquillas, 1984; Mahar, 1989; Binswanger, 1989). As a result, cattle ranching may be responsible for almost two thirds of the deforestation and environmental destruction that has occurred in the Amazonian regions of some countries (Mahar, 1989; Poveda, 1991).

High input agriculture, generally associated with crop specialisation, has led to changes in soil composition, reducing organic life, and has contributed to the chemical contamination of soils and waters, with severe consequences for human health. As previously mentioned, coffee processing has had serious effects on lands and waters, contributing to about two thirds of all water pollution in Costa Rica. In Honduras, the greatest threat to the Gulf of Fonseca is water pollution caused by the misuse of pesticides (DeWalt *et al.*, 1993).

Policies for the environment

Some specific environmental policies, adopted by governments in the last decade, have been oriented to control contamination or to protect natural resources, particularly forests. Nevertheless, there currently is a new set of public policies that have broad environmental implications and that is still in the process of being implemented. Some environmental laws have already been promulgated. They usually dictate the creation of public institutions in charge of overseeing the enforcement of such laws. To be viable, these institutions usually have required the creation of specific national funds for the environment. For instance, the Government of Bolivia, in 1990, enacted a Law of the Environment, which led to the creation

of the Secretariat of the Environment (SENMA) and of a National Environmental Fund (FONAMA), but the operative norms have not been developed.

In a similar fashion, Chile, which previously had only a number of environmentally related provisions dispersed in its complex legal system, started in 1990 to design a policy based on (1) respect for nature, (2) environmental conservation, (3) energy conservation, (4) improvement in the quality of life, and (5) international collaboration to overcome worldwide environmental problems (Alvarado, 1992).

It is still too early to evaluate the impact of these new policies on the environment. In some cases, they have been considered unclear and ineffective. Usually, they need to have the corresponding regulations approved before they become operational, and that can take years, as the Bolivian experience demonstrates.

It has also been argued that environmental policies, to be successful, ought to address the political-economic roots of the ecological crisis rather than be limited to protect and restore the ecological conditions of capitalist production (Faber, 1992a).

Perspectives for the Future

The future of Latin America is going to be characterized by declining overall population growth rates but increasing number of inhabitants due the high proportion of people in childbearing ages. Population growth is at the present 1.7 per cent per year and it is estimated that net increase in population will be at about 92 million people per year (Mink, 1993). With more

population, particularly in the urban areas, there will be increasing demand for services, food, fuel, water and other goods, placing additional stress on available natural resources.

Besides strict conservation measures for the remaining "hot spots" of biological diversity in latin America, strong public policies are needed to maintain the forested land. In this regard, it is important to keep searching for alternatives for forest protection and management, which include urban and rural residents, and particularly indigenous peoples in these efforts. The important role that the latter can play in the protection of forests has been recognized by the Government of Colombia, which in the last few years has recognized indigenous peoples title to about 18 million hectares of *resguardos*, not only in recognition of their land rights but also as a way to provide protection to the forests, in the form of thousands of forest guardians (Bunyard, 1989; Colombia, 1990).

Indigenous people of the Amazon have not only been the guardians of the forest. They have managed their forest and thus obtained from it the goods for their social and biological reproduction. Irvine (1987), for instance, demonstrates how the Lowland Quichua or Runa people of the Upper Napo Basin of Ecuador have over traditionally managed the succession of the natural forest, enhancing food production while maintaining the forest apparently intact.

There is much that can be done to reduce degradation and stabilize natural systems in areas which are in the process of deforestation. One of them is the intensification of agroforestry systems. A case study of the Ecuadorian Amazon indicates that the use of improved agroforestry technology is a real alternative for the management of secondary forests which would not have negative social or ecological implications. Improved agroforestry favours a

more productive use of labour, reducing also cash requirements during times of low prices for commodities such as coffee. In the short term, improved agroforestry can reduce the current colonists' pressure on the resources of the natural forests by finding compensatory sources of income; in the medium term, such pressure will tend to disappear once the present wood inventory enters into a productive stage (Uquillas et al., 1992).

In those areas of the continent which have been subject to continuous cultivation some of the increased food supply will come as a result of the intensification of production through the use of improved agricultural technology, particularly from high yielding varieties of crops and animals (Mink, 1993). Important social and environmental goals will have to be achieved, however, by small scale farmer production, oriented to household consumption and for internal markets, and widespread, labour-intensive environmental reconstruction (Goldrich and Carruthers, 1992).

Regarding land in tropical areas, it is argued that diversification of production rather than specialization around a comparative resource advantage has to be the central and guiding tenet of sustainable forest land use; this implies that if government subsidies are to be used, they should be directed to vertically diversified land uses instead of commodities (Browder, 1991).

Land reform and colonization will tend to be even less important as the privatization drive consolidates and available lands for new settlements become more scarce, with the exception, perhaps, of Brazil, which has extensive Amazon territories and where military circles are still concerned about "threats" to national sovereignty.

Accompanying the urbanisation process, or as a factor closely related to it, more housing and social services, transportation, and industries can be expected, and with them increasing waste and pollution.

The trend towards adoption of environmental policies will consolidate. Colombia, Venezuela, Peru, Mexico, Ecuador, Bolivia, Costa Rica, and Chile have already approved environmental legislation or created national commissions or ministries to formulate and apply environmental protection codes. In fact, protection of the environment has become a development priority and a national security concern for many Latin American countries (Muñoz, 1992).

Greater awareness of environmental issues will also generate ever more active environmental social movements. These movements could range from those specifically concerned with the physical environment to those which promote greater empowerment of local populations and even those which advocate the peasants' appropriation of natural resources.

Inequality in the distribution of resources is at the heart of the problem of environmental degradation, including the wanton destruction of primary tropical forests in the Amazon countries. Greater equity, or the reduction of poverty, must be a primary objective of sustainable development before the issue of environmental quality can be fully addressed. Besides promoting poverty alleviation through increasing poor peoples' incomes it will be necessary to make targeted interventions to reduce the risks faced by the poor and secure their rights to natural resources and to improve both their access to resources such as to land and credit as well as to essential services like education, public health and family planning (Mink, 1993).

Misguided public policies have to change. In the case of Brazil, for instance, it has been suggested eliminating public incentives for livestock projects, declaring a moratorium on the disbursement of fiscal incentives for projects which are over-exploiting timber from the natural forests, and modifying inappropriate land granting policies (Mahar, 1989). Another author has stressed less road building of fragile Amazon areas (Fearnside 1989); and this could be extended to other countries which want to reduce deforestation in tropical areas. A public policy that attempts to change the behavior of powerful groups within a nation and that of lending and donor agencies has also been recommended (DeWalt et al., 1993).

To conclude, environmental policies up to date have focused on repairing damages previously caused. Now it is necessary to focus environmental problems on their origin in macroeconomic, commercial and sectoral policies. Environmental policy must be an integral part of economic and social development policies. Its objective must be at least to prevent damages and to reduce the adverse effect of human activities and, in the best of cases, to actively promote a socio-economic policy that expands the base for sustainable development (Bruntland, 1989).

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**INDIGENOUS PEOPLES, RESOURCE MANAGEMENT, AND
TRADITIONAL
TENURE SYSTEMS IN AFRICAN DRYLAND ENVIRONMENTS**

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Introduction

A recent trend in the analysis of African systems of land and natural resource management and user rights to resources is the consideration of community-based systems of resource management (Lawry, 1990; Associates in Rural Development, 1992). Land and natural resource use and management in Africa includes the growing of crops, raising livestock on open ranges and fenced ranches, mining of economically important minerals, hunting of large mammals, gathering of wild plants for subsistence, income generation, manufacturing, and medical purposes, rural and urban industries based on natural resources, conservation of endangered and rare species, and protection of significant habitats (Office of Technology Assessment, 1984; Anderson and Grove, 1987; Hitchcock, 1993). With increased population and expanded infrastructure and development activities in both rural and urban areas, there has been an intensification of natural resource exploitation and an increase in conflicts among various forms of land use (Timberlake, 1988).

In the past several years, suggestions have been made by researchers, government agencies, and development organisations that natural resources could provide a sustainable

source of employment opportunities and rural income generation in Africa (Harrison, 1987; Stiles, 1988; USAID, 1989a, b; Pradervand, 1989). Projects incorporating community-based resource management were planned and are in the process of being implemented; these projects range from game cropping schemes to tourism and from rural industries to small-scale livestock loan schemes (for a list of some of these projects, see Appendix 1). Analysis of these projects indicates that sustainable development can only be achieved if careful attention is paid to local people's participation in decision-making, strengthening of resource management institutions, a multi-faceted approach to economic promotion, and environmental conservation and education efforts (Wolf and Brown, 1986; Harrison, 1987; Durning, 1989).

One approach that has been suggested recently is that African countries, with the help of local communities, donors, and non-government organisations, should implement projects that will diversify economies and expand incomes. It has been recommended that wildlife and wild plant products be managed in sustainable ways so that they can play more significant roles in expanding rural economies and enhancing the standards of living of local people (Stiles, 1994; Associates in Rural Development, 1992). Given the importance that many countries in Africa place on the environment and rural development, it was appropriate that national policies on development, conservation and sustainable resource utilisation should be developed and put into effect.

Listening To the People: Community Empowerment and Participation

The issues of community empowerment and local participation in rural development projects are receiving more and more attention from researchers and development organisations (Cernea, 1985; Midgley, 1986; Paru, 1987; Associates in Rural Development, 1992).

Participatory development has become a catchphrase for the kind of approach that many agencies and policy analysts are advocating. Various means of bringing about local participation have been advocated, including provision of training and education (investment in human resources), and assuring that local people have control over their own land and natural resources. ①

The concept of participation is one that is not easy to define. It can mean the right to make decisions about development action. Participation can also mean the process whereby local communities take part in defining their own needs and coming up with solutions to meet those needs. In addition, participation can refer to situations in which local communities and individuals share in the benefits from development projects and are fully involved in generating those benefits. As Chambers (1983:140) notes, "Rural development can be redefined to include enabling poor rural women and men to demand and control more of the benefits of development".

The community development approach advocated by various agencies in the 1950s and 1960s used a definition of community development which is pertinent:

Community development is a process of social action in which the people of a community organise themselves for planning and action; define their common and individual needs and problems; make group and individual plans to meet their needs and problems; execute the plans with a maximum of reliance upon community resources; supplement these resources when necessary with services and materials from Government and non-Government agencies outside the community. (International Cooperation Administration, 1955:1).

Essentially, participation and empowerment are similar to this kind of approach, especially when emphasis is placed on self-help, self-determination, and local control of resources and decision-making. In order to overcome development constraints, it is important to promote strategies of community consultation, mobilisation, and organisation. This process must also include ensuring that those communities have the ability to maintain control over their human and natural resources.

It is important to remember that the degree of willingness of individuals to take part in development action and to take responsibility for decision-making often varies tremendously, not only within specific areas, but frequently within the same family. In order to determine the various goals and objectives of local people, concerted efforts have to be made to collect information and seek feedback at the local level. What this means is that an investigatory programme must be built into all development projects. It also means that continuous monitoring and consultation has to be done during the course of project identification, design, implementation, and evaluation. If it is found that local people do not agree with the ways in which the projects are designed or being put into practice, then changes must be made or new approaches must be taken.

A number of rural development and natural resource management projects have taken an approach in which communities contribute resources of their own to the development efforts, including cash or payment in kind (e.g. labour). They have avoided handouts, which also encouraged the strengthening of local institutions so that they could make decisions on their own. In some cases, this has meant that changes had to be made in national legislation so that the institutions could manage their own finances. Promotion of literacy and numeracy among local people has been a key strategy as well.

Some Governments And Non-government organisations have developed what they term a participative extension approach to rural development (e.g. the Groups Development Programme of the Ministry of Agriculture in Botswana and the Boscosa Project of Conservation Foundation and WWF on the Osa Peninsula in Costa Rica). This kind of approach places emphasis on community involvement in all aspects of project design and execution. In some instances, this approach results in the formation of local organisations (e.g., farmers associations or women's multi-purpose development groups). It also contributes to situations in which efforts are made to provide local communities with rights over land and other resources. Agroforestry projects, for example, are being done more and more at the household level, and tenure rights are being defined in such a way that individuals and groups have de jure rights, rather than simply de facto control.

One strategy to promote participation has been to appoint local people as "change agents" or "community extension workers". By having these people at the grassroots level, it is possible for trust to be built up and for detailed knowledge about local situations to be drawn up for assisting communities. It is crucial, however, that these individuals are not seen as trying to direct the process of development; rather, they must be viewed more as facilitators and serve as advisors or information disseminators. These individuals sometimes serve as a link between community organisations and outside agencies. In this capacity, they can provide a kind of communication function.

Another strategy of empowerment and promotion of participation is institution-building or institution strengthening. Most, if not all, local communities have informal associations of people who have common interests and/or who cooperate on various tasks. Peasant communities have co-operative labour units and informal working arrangements among

members who share in agricultural labour or other activities (e.g. construction of storage facilities). Pastoral populations have social arrangements whereby livestock is cared for and managed for individual stockowners who allow the caretakers to use the products and energy of those animals. Some agricultural societies have groups which manage water (e.g. in Oaxaca in Mexico and in Iran). There are also voluntary associations such as producer and marketing groups in many places such as West Africa and South Asia. These institutions can be used as the basis for promoting development at the community level.

It has sometimes been said that local elites or extant authority structures often get in the way of participatory development. One way of getting around this problem is to involve the elites and local authorities in the development process. This was done among chiefs and their councillors in Swaziland in the traditional sector development programme, part of the USAID and Government of Swaziland manpower development project (SWAMDP), and among traditional healers in Nigeria, and it proved to be reasonably effective. Consulting local leaders at all phases of project formulation and implementation enables communities and development organisations to obtain information, and it helps to ensure that the leaders are fully aware and supportive of programme activities.

The building of capacity for local decision-making can be done in a number of ways. It can be brought about through the holding of workshops or community discussion sessions in which ideas about democratic processes of public policy formation are addressed. It can be promoted through training of various kinds (e.g. in how to form committees, draw up constitutions, and run meetings). It can also be facilitated through problem solving exercises, case studies, and role plays about situations in which communities find themselves. These kinds of strategies have been very effective in Central and South American rural

communities, among women's groups in Africa, and among farmers associations in Asia (Cernea, 1985; Economic Development Institute, 1987).

Models of Community Empowerment and Participatory Development

There are relatively few examples of truly participatory development and community empowerment programmes and projects in which local people have been fully involved in processes of change. One reason for this situation is that often development projects have short life spans, whereas institutional development and community empowerment requires long periods of time and a great deal of patience. Another reason is that often the development or conservation programmes being advocated do not lay the groundwork necessary to ensure that the local people have a stake in the projects. They also do not gain the support of the Government so that legislation is changed to make possible local control over resources.

A third reason that participatory approaches to development are overlooked is that easily definable project outputs such as infrastructure construction or agricultural yield increases are given preference over less precisely quantifiable indicators such as institutional strength and resource management capacity. Often, greater emphasis, funding and technical support are given to outside agencies (e.g. contracting groups, non-governmental organisations) than to community-based organisations (CBOs). If local communities are to be empowered and participatory development actually carried out, then there will have to be a significant change in the way that development agencies, donors and voluntary organisations deal with local people and their concerns.

Coming up with successful models of community empowerment is by no means easy, particularly since there are relatively few detailed, analytical studies that exist. One hears, for example, of the strategies employed by the Aga Khan Foundation in promoting village organisations in Pakistan and the village corporating models advocated by Norman Reynolds in southern Africa, but finding data on these models is difficult. Much of the work done on these issues has either been carried out at a theoretical rather than a practical level, or it exists in the so-called grey literature of development agencies and NGOs. It is necessary, therefore, to draw upon examples for which a fair amount of information exists.

Some of the more forward-thinking approaches to participatory development in the world are being done in Africa. As a continent, Africa is diverse, with fifty countries ranging in size from 300 square kilometers (the Maldives) to 2,205,810 square kilometers (Zaire) (see Table 1). There are over 750 million people in Africa, and the population is increasing rapidly.

The vast majority of Sub-Saharan Africans are farmers, most of whom reside in rural areas. Many people make their living through a combination of agriculture, domestic animal keeping and wage labour. Approximately 24 million Africans are herders who raise livestock both for subsistence purposes and for sale. The urban population of Africa is increasing rapidly, so much so that cities such as Lagos and Nairobi have experienced serious shortages of housing, employment and social services.

The states of Africa today are largely multi-ethnic entities that are controlled by indigenous elites who vary greatly in size and cultural characteristics. Some countries, such as Swaziland, are occupied almost entirely by a single ethnic group, but these groups are

usually subdivided along lines of kinship and social affiliation. Nigeria, on the other hand, contains as many as 160 different groups. The picture is complicated by the fact that the various African societies speak as many as 2,000 different languages and have an array of religious beliefs.

Many African governments are reluctant to acknowledge the existence of distinct indigenous groups within their boundaries. They maintain instead that all resident groups in the country are indigenous, in part because they do not wish to grant primacy of one group over another. It is extremely difficult, therefore, to obtain reliable census data broken down along tribal affiliation or ethnic group membership lines. Estimates of the number of indigenous peoples in Africa thus range from 25 million to as many as 350 million (for one estimate of the number of indigenous people in Africa and elsewhere, see Table 2). A very small percentage of Africa's people are or were hunter-gatherers (see Table 3). These groups are often considered aboriginal or indigenous because of their long-term occupancy of the regions in which they live). Hunter-gatherers, pastoralists, and farmers in Africa are flexible, resilient, and innovative in their approaches to solving economic and environmental problems. They intentionally enhance biological diversity in order to ensure long-term economic survival and ecological sustainability, as can be seen in cases where foragers and pastoralists use fire to promote the growth of desirable plant species and farmers utilise a variety of different types of crops in order to reduce risk and increase the chances of obtaining returns.

One of the reasons for Africa's successful implementation of community empowerment and participatory development projects is that a wide range of community organisations are involved in self-help, development, and conservation activities (see Table 4). The

organisations often manage resources co-operatively, as is the case among grazing associations in Lesotho and the Horn of Africa and forestry committees in East and West Africa. Numerous communities and individuals in Africa have called for a new approach to development -- one which is not socially and environmentally destructive. They argue that they have a right to sustainable development, development which has been defined as that which " . . . meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987:13). This approach is seen by many individuals and groups in Africa as the only way to overcome the difficulties people are experiencing.

One strategy for promoting sustainable rural development currently being debated is the use of local common property resource management (CPRM). Common property resource systems combine local control of resources with measures to promote sustainable use. More and more communities and non-government organisations are arguing in favour of community-based resource management as a sustainable development strategy (Associates in Rural Development, 1992). There are growing numbers of projects and community activities in Africa which are attempting to implement community-based resource management projects that are participatory in their orientations (see Appendix 1). Some of these projects have been relatively successful, while others have faced constraints ranging from lack of sufficient resources to the unwillingness of higher-level institutions to decentralize authority to grassroots-level organisations. In the balance of this paper, I consider some models of community empowerment that have been attempted in parts of southern Africa in an attempt to illustrate some of the strategies that have been employed in the promotion of sustainable development in African environments.

Case 1: The Purros Project in Namibia

An example of a sustainable development programme one being pursued by a Namibian non-government organisation, Integrated Rural Development and Nature Conservation (IRDNC) and some Himba communities in the Kaokoland region of northwestern Namibia. The Purros Project is a multi-pronged small-scale development effort aimed at improving the lives of several hundred Himba and Herero pastoralists residing in and around the community of Purros (for discussions of this project, see Owen-Smith and Jacobsohn, 1989; Jacobsohn, 1991).

The Himba and Herero can be described as "multi-use strategists." They combine semi-nomadic pastoralism with periodic wage labour and small-scale rural industries such as handicraft manufacture. Like many other indigenous populations in southern Africa, they had extensive environmental knowledge, small group sizes, widespread population distribution, and relatively simple but efficient technology. The use of buffering strategies and social mechanisms to bring pressure on individuals involved in over-exploiting resources were key means of ensuring the long-term sustainability of resources. Communal mechanisms also serve to control exploitative intrusive behaviour of outsiders. ②

One of the components of the Purros Project is a community game guard system that employs Himba and Herero men to oversee an area of 95,000 square kilometers of rugged mountains and semi-arid sandy plains. The game guards, who are not armed, have been able to stop the killing of desert elephants and black rhinoceros at a cost which is much lower than that of the paramilitary anti-poaching campaigns conducted elsewhere in Africa. The Himba and Herero have been able to do this not only because of the presence of game guards

who monitor the area carefully but also because of the social pressure brought to bear on individual community members to conserve resources.

A second component of the Purros Project is ecotourism. A levy of 25 rand (about \$12) per person has been imposed on tourists entering the area, and the money generated is divided among community members as they see fit. Initially the idea was to give the money to male household heads, but the women objected strenuously to this plan. Eventually, it was decided to allocate the money equitably among the various household members.

Tourists are given information as to what they should and should not do in the Purros area. Driving across old campsites -which are considered sacred by the Himba -- is not allowed. In addition, tour operators have been told by local community members that the tourists they bring in should make it a point to stop and greet community residents before taking photographs or purchasing handicrafts. They have been given estimates of what fair prices are for the crafts bought from the Himba and Herero. They have also been made aware of the need to limit the environmental impacts of tourism, including firewood depletion and the leaving of refuse.

The Purros tourist system represents an institutional response to a potential resource and land use conflict situation. By agreeing to a fixed set of rules and by determining specifically who was eligible for benefits, the Himba and Herero have been able to profit equitably and sustainably from their wildlife and the tourism it attracts without increasing social tensions and environmental degradation. The benefits that have been generated by tourism have been re-invested in community activities.

Case 2: The J/'hoansi Bushmen (San) Development Programme in Namibia

The J/'hoansi Bushmen Development Programme in northeastern Namibia is an integrated rural development programme that began in 1981. Initiated originally as a "cattle fund" to provide J/'hoansi groups with livestock, tools and seeds, it has grown into a multi-faceted development programme which is characterised by close co-operation between a non-government organisation, the Nyae Nyae Development Foundation, and a community-based organisation, the Nyae Nyae Farmers Cooperative. A key feature of the programme is the manpowerment of J/'hoansi communities through a bottom-up development approach.

In the early 1980's three J/'hoansi groups elected to leave the settlement of Tjumikui in Eastern Bushmanland and return to their original territories. They did this in part to get away from the oppressive atmosphere of a government-sponsored settlement where social conflict, poverty and dependency was rife. They also did it in order to re-establish their claims to their ancestral lands. By 1986, when the Nyae Nyae Farmers Cooperative was formed, there were over a dozen communities residing in their traditional territories and pursuing a mixed economic strategy of foraging, livestock production, gardening and wage labour. As of 1992, there are 35 such communities, each with their own water source and surrounding foraging and grazing areas.

The Nyae Nyae Development Foundation has provided technical assistance and funding to the J/'hoansi communities in their efforts to become self-sufficient. Emphasis has been placed on social and economic development along with education and training. The Foundation has used a variety of participatory development strategies along with innovative organisational and communication methods. Human resource development has been a

primary focus of the programme with literacy, vocational, and on-the-job training activities being supplemented with both formal and non-formal education.

The model being used by the Foundation stresses communication and self-determination at all levels. The formation of the Nyae Nyae Farmers co-operative was a result of close consultation with local J'hoansi, none of whom had any experience with setting up and running representational bodies. Initially, the J'hoansi had open meetings in which literally hundreds of people participated in the traditional style of consensus-based decision-making. Later on, the communities began to delegate some of the responsibility for attending meetings to specific individuals. Elections were held, and two representatives were chosen from each of the communities to take part in the co-operative meetings. Women's participation in the NNFC leadership was encouraged actively by the J'hoansi.

Some of the activities of the Nyae Nyae Farmers Co-operative include seeking control over the land and resources of Eastern Bushmanland, promoting development activities and taking part in land use and environmental planning with Government agencies, NGOs and people in the private sector. The NNFC has acted as a corporate body in seeking to convince outsiders who have moved into the area with their cattle to move elsewhere. The Cooperative has also collaborated with the Foundation in seeking ways to promote better resource management. It has taken part in studies (e.g. a conservation and development planning exercise conducted in early 1991) which have led to the formulation of recommendations on land use. In addition, the NNFC has sought to draw attention to issues relating to land tenure and resource rights at national and regional conferences (e.g. the National Conference on Land Reform and the Land Question held in Windhoek in June-July 1991).

NNFC operates as an independent body which considers public policy matters at its meetings. It undertakes trips to all the communities in Eastern Bushmanland in order to listen to the concerns of local people, and it provides them with information. It has made people aware of political, economic and environmental issues. It has its own bank account and it runs its own cooperative shop and handicraft purchases operation. Over the six years of its existence, the cooperative has evolved into a flexible, effective organisation for internal communication and external representation.

The NNDFN and the NNFC together and separately have used a participatory approach to development. No decisions are made without having gauged the opinions of the entire population. In some cases, this has meant that new projects have had to be held in abeyance until such time as all the communities were contacted, a process which is by no means easy in a setting in which 35 different villages are dispersed across a 6,300 square kilometre area. The advantage of this approach is that once initiatives are agreed upon, they have the full support of the J/'hoansi, who then play key roles in implementation (e.g. in providing community labour).

In the past four years, the NNFC has participated in exchange visits with other groups in communal areas of Namibia. The members of the cooperative have shared their experiences and have sought to learn how others have dealt with development problems. The NNFC is taking part in leadership training and is in the process of expanding its management team and setting up its own administrative staff. It is aiming at playing a leading role in a detailed land use planning exercise for Bushmanland. The NNFC hopes to be able to establish itself as a selfsustaining development organisation within the next decade.

Direct and Indirect Participation

It has become a truism that the failure of many development projects is a result of lack of direct and indirect participation of local people who theoretically are supposed to be beneficiaries. In some cases, development agencies take a "topdown" approach in which local people are not consulted before, during, or after the implementation of the project. In other cases, people may be asked whether they agree with the project goals, but they do not have any say in the ways in which the project is implemented.

The most effective development projects are those which incorporate local people in decision-making at every stage of the development process. Consultation alone, however, is insufficient. Local people must play a role in the identification of problems and constraints; they must assist in designing interventions to address those factors; and they must be part of the management of whatever programmes or projects are established.

There are examples of projects in which management authority is ceded over target areas by Government agencies to NGOs. This is the case, for example with the Annapurna Conservation Area in Nepal (Wells and Brandon, 1992:44, 83-85). There are relatively few examples of situations in which Governments have allowed local people total control over resource management and development action. Local communities do sometimes get control over specific resources (e.g. grazing in the case of pastoral associations in eastern or southern Africa, or water in the case of irrigation organisation in Mexico, Peru or south-east Asia). Governments can assist local communities through passage of enabling legislation, as occurred in the case of Appropriate Authority status granted to District Councils in Zimbabwe under the Parks and Wildlife Act or the establishment of multiple-use areas in

Niger and Uganda.

It is interesting to note that many of the conservation projects established for preservation of biodiversity have had more indirect than direct benefits for local people. In cases such as Amboseli in southern Kenya, for example, the idea was to promote conservation and tourism by declaring the area a national park. Local Maasai were supposed to be able to continue their traditional land use patterns in the buffer zone around the park while at the same time gaining access to economic benefits from tourism. As it has worked out, wildlife has increased, which has encouraged more tourism, but the benefits accruing to most of the Maasai are relatively small from an economic standpoint. Some Maasai have, however, been able to gain full legal title over land. (4)

Many of the benefits of rural development projects that ostensibly are for local people end up going instead to middlelevel institutions. This situation can be seen in the case of the Kajiado County Council near Amboseli, for example, and it is also a feature of some of the district councils in the CAMPFIRE programme in Zimbabwe such as Tsholotsho. In some cases, local leaders divert some of the resources to their own purposes, as has occurred in the case of the Administrative Design for Game management Areas (ADMADE) Programme in Zambia or in some programmes in Indonesia and South America. Efforts have to be made to ensure that local communities receive direct benefits in exchange for the costs that they bear.

The participatory development and community empowerment models that are most effective are those which not only promote the involvement of local people in decision-making, but also ensure that those people have complete control over their own resources.

This kind of approach is advocated relatively frequently, but rarely put into place in an effective way, on external assistance in the form of funds or technical expertise. Few communities have complete control over all of their resources, in part because most states retain the rights to valuable assets such as minerals and timber or cede over those rights to private companies in exchange for a portion of the profits.

One of the problems with CAMPFIRE (the Communal Areas Management Programme for Indigenous Resources) in Zimbabwe and other rural development programmes in southern Africa is that many of the decisions about resource management come from outside the producer community. This can be seen, for example, in those cases where the district councils make suggestions to lower-level institutions as to how they should spend the money obtained from wildlife revenues. It should be stressed however, that some of the people at the local level have begun to lobby hard for greater decision-making power, something that district councils have begun to take greater notice of. Even if the situation in Zimbabwe cannot at present be described as one in which the communities have been empowered, it is not unlikely that the trend is toward increased participation in decision-making at the local level.

Conclusions

Experience in Africa has demonstrated that there are a number of conditions which must exist if sustainable development is to be achieved.

- (1) Communities must have control over the means of production, especially land and capital;

- (2) Local institutions should be self-governing should have a significant voice in resource management;
- (3) communities must have decision-making power and authority to undertake projects that they deem necessary;
- (4) Projects must be of sufficient small scale to be managed the local level of the community or on a multi-community level;.
- (5) Capital-inputs must be such that they do not overwhelm the capacity of the local institutions to cope with them;
- (6) The management and administration of the projects should not be overly complex organisationally;
- (7) Local institutions should pursue activities that are beneficial to as wide a number of people as possible and that are equitable in terms of distribution of power and resources;
- (8) Project identification, design, and implementation must be done in such a way that dialogue between local people and development agencies is on-going, and the discussions should have effect on the directions the project takes;
- (9) Natural resource management and governance regimes must take account of diverse and legitimate interests;

- (10) There should be means of ensuring that the environment is not overtaxed by the development activities;
- (11) Fair, just, and socially acceptable mechanisms for conflict resolution must be available;
and
- (12) The institutions involved in resource management must be willing to impose sanctions if individuals and communities fail to comply with the rules.

People of Africa have called for greater emphasis on sustainable development strategies. If they are to survive, local people have argued, they must have the opportunity to get secure access to resources, including land, labour, capital, and development-related information. They must also be allowed to determine the kinds of projects to be implemented. Community consensus should be seen as crucial to project success.

Participatory development strategies are now being employed in many parts of Africa. Using community-based resource management systems, local organisations have been able to promote development without sacrificing the environmental integrity of their regions. Although not all of their activities are successful, African communities are learning important lessons. As they note, the future of their communities -- and of the world generally -- lies in their children. Only when the needs of these children are taken into consideration will there be really successful socio-economic development and human rights for all.

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Table 1. Geographical, Population, and Economic Data on African Countries.

Name of Country	Size (sq km)	Population (1992)	Gross Domestic Product (GDP)
Algeria	2,381,740	26,666,921	\$54 billion
Angola	1,246,700	8,902,076	\$8.3 billion
Botswana	600,370	1,292,210	\$3.6 billion
Burkina	274,200	9,653,672	\$2.9 billion
Cameroon	475,440	12,658,439	\$11.5 billion
Cape Verde	4,030	398,276	\$310 million
Central African Republic	622,980	3,029,080	\$1.3 billion
Chad	1,284,000	5,238,908	\$1.0 billion
Comoros	2,170	493,853	\$260 million
Congo	342,000	2,376,687	\$2.4 billion
Djibouti	22,000	390,906	\$340 million
Egypt	1,001,450	56,368,950	\$39.2 billion
Equatorial Guinea	28,050	388,799	\$156 million
Ethiopia	1,221,900	54,270,464	\$6.6 billion
Gabon	267,670	1,106,355	\$3.3 billion
The Gambia	11,300	902,089	\$207 million
Ghana	238,540	16,185,351	\$6.2 billion
Ivory Coast	322,460	13,497,153	\$10 billion
Kenya	582,650	26,164,473	\$9.7 billion
Lesotho	30,350	1,848,925	\$420 million
Liberia	111,370	2,462,276	\$988 million
Libya	1,759,540	4,484,795	\$28.9 billion
Madagascar	587,040	12,596,263	\$2.4 billion
Malawi	118,480	9,605,342	\$1.9 billion
Maldives	300	234,471	\$174 million
Mali	1,240,000	8,641,178	\$2.2 billion
Mauritania	1,030,700	2,059,187	\$1.1 billion
Morocco	446,550	26,708,587	\$27.3 billion
Mozambique	801,590	15,469,150	\$1.7 billion
Namibia	824,290	1,574,927	\$2 billion
Niger	1,267,000	8,052,945	\$2.4 billion
Nigeria	923,770	126,274,589	\$30 billion
Reunion	2,510	626,414	\$3.37 billion
Rwanda	26,340	8,206,446	\$2.1 billion
Sao Tome and Principe	960	132,338	\$46.0 million
Senegal	196,190	8,205,058	\$5.0 billion
Seychelles	455	69,519	\$350 million
Sierra Leone	71,740	4,456,737	\$1.4 billion
Somalia	637,660	7,235,226	\$1.7 billion

South Africa	1,221,040	41,688,360	\$104 billion
Sudan	2,505,810	28,305,046	\$12.1 billion
Swaziland	17,360	913,008	\$563 million
Tanzania	945,090	27,791,552	\$0.9 billion
Togo	56,790	3,958,863	\$1.5 billion
Tunisia	163,610	8,445,656	\$10.9 billion
Uganda	236,040	19,386,104	\$5.6 billion
Western Sahara	266,000	201,467	\$60 million
Zaire	2,345,410	39,084,400	\$9.8 billion
Zambia	752,610	8,745,284	\$4.7 billion
Zimbabwe	390,580	11,033,376	\$7.1 billion

Source: The World Factbook (1992). Washington, D.C., U.S.
Government.

Table 2. Estimated Number of the World's Indigenous Peoples

Region	Number of Groups	Overall Population	
Africa	2,000	50,000,000	
Batwa (Pygmies)		200,000	(7 countries, central)
Bushmen (San)		95,000	(6 countries, southern)
Byle (Somalia)		450	
Hadza (Tanzania)		1,000	
Maasai (Tanzania/Kenya)		500,000	
Tuareg (Tamacheq)		3,000,000	(5 countries, west)
Australia and New Zealand	100	550,000	
Aboriginals		300,000	
Maaori (New Zealand)		250,000	
China and Japan	56	67,000,000	
Ainu (Hokkaido, Japan)		26,000	
Shui (Guizhou, China)		280,000	
Former Soviet Union	135	40,000,000	
Saami (Russia)		65,000	
Latin America and the Caribbean	800	40,000,000	
Ache (Paraguay)		400	
Mapuche (Chile)		600,000	
Miskito (Nicaragua)		75,000	
Yanonami (Brazil, Venezuela)		20,000	
North America	250	3,500,000	
Indians (Canada)		1,500,000	(633 bands)
Indians (United States)		2,000,000	(515 tribes)
The Pacific	750	2,000,000	
Papuans (New Guinea)		1,300,000	
South Asia	700	70,000,000	
Adivasis (India)		63,000,000	
Tribals (Bangladesh)		1,200,000	
Southeast Asia	500	30,000,000	
Orang Asli (Malaysia)		71,000	
Penan (Borneo)		20,000	
Thailand Hill Tribes		484,000	
GRAND TOTAL	5,290	357,000,000	

Note: Data obtained from a map entitled "Earliest Residents," *The World Monitor* 6(3):11 (1993) as well as Burger, (1990); IWGIA, (1992); Durning, (1992); and Hitchcock, (1993).

Table 3. Indigenous African populations who are or were hunter-gatherers and researchers who have dealt with them

Name of Group	Location	Researchers Who Have Worked with Them
Koroka, Kwepe, Kwise	Angola	A. de Almeida
Va-Nkwa-Nkala	Angola	S. Souindola
San (Basarwa)	Botswana	L. Marshall, J. Marshall, Kalahari Research Committee (Witwatersrand University), Harvard Kalahari Research Group, A. Barnard, M. Guenther, H.J. Heinz, G. Silberbauer, J. Tanaka, E. Wilsman, P. Wiessner, University of New Mexico Kalahari Project, S. Kent, H. vierich, J. Yellen, A. Brooks, P. Motsafi, G. Childers, A. Thoma
Fuga	Ethiopia	W. Shack
Boni	Kenya	D. Stiles
Dahalo	Kenya	D. Stiles
Dorobo (Okiek)	Kenya	C. Chang, M. Ichikawa, C. Kratz, G. Huntingford, R. Blackburn, C. Hobley
Mukogod	Kenya	G. Worthy, L. Cronk
Waata	Kenya	B. Heine, D. Stiles
Mikea	Madagascar	D. Stiles, B. Kelly
Ovatjimba	Namibia	B. J. Grobelaar, H.R. MacCalman, M. Jacobsohn
San (Bushmen)	Namibia	Marshalls, R. Gordon, T. Widlok, Nyae Nyae Fdn.
Batwa (Pygmies) (e.g. Aka, Efe, Sua, Nbuti)	Ituri Forest, Zaire Central African Republic, Cameroon Congo, Rwanda, Gabon	D. Turnbull, M. Ichikawa, J. Hart, T. Hart, R. Harako, G. Morelli, P. Putnam, L. Cavalli-Sforza, D. Wilkie, P. Schebesta, B. Hewlett, S. Bahuchet, H. Guillaum, J. van de Koppoll, T. Tanno, P. Ellison, J. Pedereen, R. Bailey, N. Peacock, H. Bode, I. DeVore, R. Aunger, S. De Zaldondo
Eyle	Somalia	H. Terashima, Z. Waehe S. Brandt
Kilii	Somalia	D. Stiles
Hadza	Tanzania	J. Woodburn, J. O'Connell, K. Hawkes, E. Ten Raa, N. Blurton-Jones, H. Bunn, L. Bertram, D. Ndagala, K. Tomita, J. Newman, L. Smith, W. McDowell
Kwandu	Zambia	B. Reynolds
Amagili	Zimbabwe	A. Campbell, R. Hitchcock
Doma (VaDema)	Zimbabwe	C. Cutshall, R. Hassler

Note: Data obtained from publications, archival research, files of development agencies and non-government organizations, and African government reports and censuses.

Table 4. Community organizations in Africa involved in self-help, development, and conservation activities

Type of organization	Location
Farmers' Association	widespread
Multipurpose Development organization	widespread
Cooperative	widespread
Pastoral Association	Kenya, Somalia
Grazing Association	Lesotho
Refugee Association	Ethiopia, Sudan, Malawi
Women's organization	Kenya, Swaziland, Tanzania, Swaziland, Zimbabwe, Botswana
Fishermen's Cooperative	Mozambique, Zambia, Botswana
Hunters' Cooperative	south Luangwa, Zambia Binga, Kyaminyami, Zimbabwe
Village Council	Zimbabwe
Council of Elders	widespread
Fencing Group	Botswana
Village Development Committee (VDC)	Botswana
Burial Society	Botswana, Swaziland
Water Committee	widespread
Health Committee	widespread
Sanitation Committee	widespread
Conservation Committee	Botswana
Forestry Committee	widespread

Note: Data obtained from archival and fieldwork and from the following sources: Harrison (1987); Pradervand (1989); Durning (1989, 1992); Hitchcock (1993).

APPENDIX 1.

Projects in Community Based Natural Resource Management
and Sustainable Socioeconomic Development in Africa

Project	Country	General Comments
D'Kar	Botswana	a development trust known as Kuru comprised of 5 communities involved in a wide range of activities
Kedia	Botswana	a wildlife utilisation project in a remote community of 700 in the western Central District
Lorolwane	Botswana	a communal grazing area with an estimated 200 households involved in several rural communities involved in wildlife utilisation, tourism, and handicrafts project
Mabutsane	Botswana	a conservation trust involved in a sanctuary and tourism and program
Nata Sanctuary	Botswana	a sanctuary and tourism program
Dimokika Wildlife Reserve	Congo	small-scale exploitation of plants for commercial purposes, crafts
Nouable-Ndoki	Congo	a forest conservation project that incorporates local people, income Forest generation, training, and employment
Goviefe Agodome	Ghana	community-based agroforestry efforts by a village mobilization squad
Mount Nimba	Guinea, Cote D'Ivoire	community resource management efforts in preserve buffer zones
Amboseli	Kenya	some benefits from use of the park to to Maasai in the surrounding area
Maasai Mara	Kenya	use of national park by pastoralists for grazing, ecotourism activities
West Pokot District	Kenya	tree planting by Pokot communities in Chepareria Division and formation District of local institutions
Njoguini, Gitero, Kabati	Kenya	a multi-community self-help water project that provides irrigation and domestic supplies to three villages

Bokong	Lesotho	local communities involved in a multi-purpose reserve area that includes Reserve grazing, a vultury, and tourism
Sehlabathebe	Lesotho	a grazing association consisting of livestock owners who manage an area of range land on a communal basis
Lake Malawi	Malawi	multi-faceted development along the shores of the lake, ranging from fisheries to agroforestry, tourism
Bore Forest Mali		a multi-community governance project in which local villagers manage a series of local forest areas
Mopti	Mali	community woodlot activities by local villagers
Bazaruto	Mozambique	fishermen in Bazaruto Archipelago involved in a game guard system overseeing turtle nests and tourism
Caprivi	Namibia	two groups in Mafue involved in a community game guard system
Purros	Namibia	Himba and Herero communities involved in tourism, handicrafts, and a community game guard system
Air-Tenere Nature Reserve	Niger	a wide-ranging conservation and resource management program that also promotes rural development
Guesselbodi	Niger	a natural forest management project that promotes local development and rehabilitation of a degraded area
Virunga	Rwanda,	tourism related to gorillas in which local people get jobs, some benefits
Central	Somalia	establishment of water points and grazing association formation
Rangelands Zeederburg	South Africa	A small group of Bushmen on a farm in the northern Cape involved in tourism
Richtersveld	South Africa	Nama groups allowed access to a park for grazing and tourism
Kosi Bay	South Africa	a chiefly game reserve with Tonga and Zulu involved in tourism

Piggs Peak	Swaziland	a number of <u>zenzele</u> associations (women's self-help groups) engaged in income generating activities, horticulture, and fish production
Ngorongoro Conservation Area	Tanzania	benefits to local communities from tourism, infrastructure development Conservation and institution strengthening
Usambara	Tanzania	East Usambara Mountains Agricultural Mountains Conservation Project includes agriculture, agroforestry, livestock production, and fisheries
Bwindi	Uganda	the Development Through Conservation Project (DTC) includes Forest development activities of local farmers and the strengthening of resource management
Ruwenzori	Uganda	Ruwenzori Mountaineering Service (RMS), indigenous NGO, guides hikers
Lupande (ADMADE)	Zambia	a wildlife utilisation program with environmental education and training as well as village scouts employment
CAMPFIRE	Zimbabwe	wildlife utilisation, tourism, and income generating projects in 20 of Zimbabwe's 55 districts; rural development activities and benefits distribution are included in program

**GENDER AND PARTICIPATION IN THE CONCEPTION, PLANNING, AND
IMPLEMENTATION OF ENVIRONMENT AND DEVELOPMENT PROJECTS
IN THE DRYLANDS**

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Western ignorance of the relevance of women in pastoral and agropastoral dryland management continues to contribute to the extraordinarily weak performance of rural development interventions among the poor majority in the world's drylands (see Jowkar et al., 1991). While it is not the only cause of failure (other causes include generally impoverished understandings of the political ecologies of dryland production, the paucity of appropriate "technical packages," and the often destructive policies of governments and donor organizations (Horowitz, 1989), it is certainly among the most salient. A gender-sensitive approach to dryland development is perhaps even more critical today than it was in 1977 when the first Nairobi Conference on Desertification was held, because whether or not dryland environments in general have continued to deteriorate,² it is beyond question that the economic well-being of dryland populations has worsened markedly and the great brunt of that worsening is being borne by women, children, and the elderly. On pastoral rangelands, on rainfed agricultural lands, and on riverine floodplains in drylands smallholder households are less and less able to sustain themselves *in situ*, and there has been a torrential emigration of labour, primarily young adult male labour, in search of income-generating activities elsewhere. An invariable result is that children, the elderly, and especially women have had to assume disproportionate shares of the burdens of

rural production typically without being vested with jural rights over resource management. Let us examine this phenomenon among dryland pastoralists and agropastoralists.³

Political Ecological Change on Pastoral Rangelands⁴

Most livestock development interventions in Africa, the Middle East, and much of Central Asia have been at best unimpressive, and many of them actually worsened the conditions they were supposed to repair. In the decade following the sahelian drought of the late sixties and early seventies, more than \$600 million was expended for livestock projects in Sub-Saharan Africa alone (Eicher, 1985:31). Projects were appraised that would fundamentally restrict communal access to rangelands and that sought to increase livestock offtake. Apart from veterinary actions, which are often—although not invariably—appreciated by herders (Crotty, 1980), few if any of the range management, hydrologic, genetic, feeding and finishing, and marketing interventions measurably increased production, enhanced producer income, improved the environment, or provided satisfactory returns on investment (Horowitz and Little, 1987). Livestock development projects achieved their objectives so rarely that during the latter part of the 1980s a general disillusionment with them pervaded many of the major development funding organizations. In 1994, pastoral production systems are threatened almost everywhere, and in the main not by their own actions, population growth, or even changing climate. Herders—women, men, and children—are victimized rather by policies imposed by governments that favour more sedentary peoples and more sessile production systems; by adverse terms of trade between locally produced and imported goods; by a concentration of animal ownership in the hands of a minority of affluent herders and absentee civil servant, merchant, and farmer herd owners; and by inappropriate development interventions implemented with the assistance of bilateral and multilateral financing agencies.

Pastoral women suffer a double bias. In addition to their victimization as pastoralists, a burden they share with pastoral men, they are victimized as women, that is, by androcentric ideologies (both indigenous and Western) that obscure and denigrate their productive and reproductive contributions.

① Women's lives in pastoral and agropastoral societies in Africa, the Middle East, and Central Asia have recently undergone great transformations. Although the precise changes depend in part on the internal stratification of pastoral communities and how these have been incorporated into the larger economic and political processes, the status of women has generally deteriorated. While it is undeniable that jural rights dictating property allocation in subsistence pastoralism have been generally gender discriminatory, women's productive and reproductive contributions have been essential to the viability of nomadic herding. Men's greater association with herding and formal political processes was balanced by women's domestic responsibilities and by their participation in herd-related tasks, which granted them a measure of autonomy and social status. Cultural values attached to marriage, fecundity, and seniority further legitimized women's power. A decline in the importance of livestock as a production and consumption factor, and changes in household labour and herd composition, have paralleled a steady erosion of female traditional rights and a marked increase in gender-based differential access to property and cash (Talle, 1988).

An appreciation of the changing conditions of pastoral women today must take into account how these production systems are affected by the interconnected processes of economic diversification, marginalization, and social differentiation.⁵ In the next section we outline the major threats to the continued viability of pastoral production systems in dry areas of Africa, the Middle East, and Central Asia, and indicate how pastoral women have been affected by these processes.

Loss of Pastoral Land and Restrictions on Pastoral Mobility

The recurrent ease with which modern states abrogate pastoral land tenure and assign use rights of former grazing lands to nonpastoral peoples reflects not only an anti-nomad ideology but also the fact that political elites rarely are members of herding communities, and often identify with groups with histories of antagonistic relationships with herders. These elites are therefore predisposed to respond negatively to the interests of pastoralists. State attempts to restrict the movement of herders attack the very basis of their survival. As early as the 1920s, Reza Shah instituted a forced sedentarization of pastoralists in Iran (Darling and Farvar, 1972:678), with a resultant "sheep mortality of 70 to 80 percent." In Eastern Africa, large pastoral land areas were transferred to European settlers (Matampash, 1991:28). The failure to understand the significance of movement for herd well-being leads to a constant erosion of pastoral property rights, as states seek to reduce the amount of land devoted to herding. In socialist Tanzania, herders were sedentarized in Ujamaa villages from which a large number of animals were grazed on a relatively small area. "The problem of localizing extensive herds of livestock became quickly apparent, as 'villages' became centres of environmental degradation and malnourished animals . . ." (Galaty, 1988:293).

Many projects funded by bilateral and multilateral donor organizations tried to limit pastoral movements by instituting new water points, veterinary services, and "managed grazing" techniques for participating herders who would agree to maintain no more than a fixed number of animals within a geographically defined perimeter. Recurrently pastoral peoples are deprived of their land rights in favour of other segments of the population. In general, the following mechanisms are employed:

- establishing wildlife reserves on rangelands (Homewood and Rodgers, 1991; Århem, 1985; Collett, 1987; Lindsay, 1987; Turton, 1987; Zuppan, 1992);

- favouring the expansion of rainfed agriculture onto rangelands (Fauck, et al. 1983:51; Horowitz, 1972, 1973, 1975; Horowitz et al., 1983; Horowitz and Little, 1987:62-3; Ibrahim, 1984:110-18; Lane and Pretty, 1991);⁶ and replacing rainfed and floodplain agro-halio-pastoral production systems with large-scale irrigation, often on dam-regulated rivers, displacing herding peoples from critical dry season pastures.

Of these, the encroachment of rainfed and irrigated agriculture most significantly affects the status of women. Sedentarization and women's participation in farming and cash-generating activities have had paradoxical consequences for women regarding their familial relations, gender identity, work load, and status. Shifts in household size and structure of authority, support network, and marriage patterns, lead to status deterioration for the majority of women. In the past, extended households provided a social network where women could share domestic duties. Transhumance tasks, such as erecting and dismantling tents, packing, and moving, were often shared by women, even though each might have been responsible for the daily domestic tasks of her own household. Where nomadic herding declines in importance, the large extended household loses its utility as the major unit for mobilization of labour and resources (Broch-Due, 1983). Reports on the occurrence of polygynous households are inconsistent (Bonfiglioli et al., 1988; Marx, 1984; Sørensen and von Bülow, 1990), but it appears that families on settlement schemes are becoming increasingly nucleated in isolated dwellings, while notions of household self-sufficiency and individual privacy are on the increase (Talle, 1990). Physical isolation and nuclearization of families have undermined the social bases for women's collaboration (Broch-Due, 1983; Sørensen and von Bülow, 1990; Talle, 1988; Watson et al., 1988). Pressed by the need for cash, women are confronted with increasing work loads exactly when the institutional

bases for exchanges of service and assistance are being withdrawn and when the ideals of housewifely duties and dexterous performance of feminine domestic chores are gradually gaining prominence as a source of self-esteem among sedentary women (Ensminger, 1987).

Where pastoral women become involved in commercial cropping, they may also face marketing difficulties. Where women are restricted by their reproductive tasks, and possibly by a linguistic barrier and moral codes that constrain female mobility, they have limited opportunities for contacts outside of their households (el-Bushra, 1986). Detached from market sites, they must rely on their male relatives to sell their products, which affects their control over earnings.

Discrimination against women is related not only to legal measures favouring men, but is also rooted in androcentric indigenous interpretations of customary rights to land and its products. Women may resist by forming spontaneous collective action groups to counter discrimination and male exclusivity. In Kenya, under both colonial and national governments, gender discriminatory land tenure laws increased the intra-household struggle between men and women over access to resources. Using familial kinship idioms, men interpreted to their own benefit various state laws that legitimated individuation of land ownership, without commensurately remunerating women's labour. Most of the information about this process is from agricultural rather than pastoral regions. In coffee-farming Murang'a district, women resisted their growing subordination by participating in voluntary collective action groups to counter male solidarity based on kinship ideology (Mackenzie, 1990).

Unequal access to farm land may be compensated for by other cash-generating survival activities. Pastoral women are active in handicrafts, sewing, charcoal making, beer brewing, wood and herb collecting, and prostitution (Brown, 1983; Hjort af Ornäs, 1990; Hogg, 1986).

As extensions of feminine traditional and domestic tasks, women's income-producing activities require little investment for training, and may create a margin of manoeuvre for their individual independence and freedom of choice when traditional social relations of support are slowly eroding as pastoralism ceases to be an available economic activity. With access to cash-generating activities, it is not surprising to witness a higher rate of divorce among these women (Adu Bobie, 1981; Quechon, 1985). However, in the larger arena of the labour market and socioeconomic hierarchies, where men are generally favoured in terms of prestigious jobs and higher salaries, women's income-generating activities bring little social status (Brown, 1983; Hogg, 1986). These sources of income and empowerment for women and their dependents also pose additional time constraints on their already heavy daily domestic labour load (Lewando-Hundt, 1984; Merryman, 1984), and rarely allow women to accumulate enough capital to rebuild their herd. Among the Samburu, older widows, who can no longer invoke kinship relations to borrow livestock for herd reconstruction, migrate to the town of Isiolo in search of employment, where a few have become successful traders and acquired animals (Hjort af Ornäs, 1989).

Where group ranches have been established they have generally not been successful. Grandin's (1986:9) assessment of Kenya group ranches is that they "have not led to destocking, improved grazing management, or increased commercial livestock production . . . Rather, tenure insecurity has fostered increased individuation of production, with concomitant loss of labour economies and increased tensions within the community."⁷ Ownership of group and individual ranches was not granted to women. Gender discriminatory registration laws contributed to greater age and gender antagonism, with women systematically excluded from any legal claim to land holding. Among the Maasai, group ranches were part of economic policies that transformed the household structure and gender relations of authority. Women, who in their roles as daughters, wives, and mothers had some claim over animals and participated in processing and distributing dairy products, were slowly disenfranchised under new legal codes

and adopted the status of unpaid workers taking care of their husbands' livestock (Kipuri, 1989; Talle, 1988). With the heavy outmigration of men from the pastoral regions, women are increasingly assuming the burdens of livestock management but without the jural authority over land use that ranch membership conveys.

Rangeland privatization in northeast Somalia began about 30 years ago, and has rapidly accelerated in the decade of the 1980s. Today relatively little communal land remains in Erigavo District, with the bulk of social costs for this privatization borne by pastoral women, who are responsible for day-to-day herd management. Women were queried as to the benefits and costs of the process of converting communal lands to private use:

The most frequently stated benefit of range privatisation was that the pastoralists no longer had to move away from their home areas with their livestock That is, both the period and frequency of absence had diminished. Significantly, none of the women listed an increased access to educational and health facilities as being an advantage, in contrast to the beliefs of many Regional Government officials.

On the other side of the balance sheet the pastoral women listed the costs of range privatisation as being:

- an increased rate of soil erosion and vegetation loss . . .
- an increased difficulty in finding pasture for their livestock particularly late in the Jilaal (long dry season),
- the incidence of private range boundary disputes in which a number of women incurred heavy beatings from their neighbours,

- the increased difficulty and time involved in gaining access to water points due to the need to circumnavigate the perceived (and commonly invisible) boundaries of the private range areas of others,
- an increased incidence of animal diseases (some of which they had never seen before) due to livestock crowding and the limitation of access to fresh pastures,
- the increased stress of having to continually and personally herd their flocks so that they did not cross over their neighbour's unclear boundaries; a requirement which meant that the flocks could only rarely be left in the charge of younger children as had traditionally been done.

In addition to livestock management, pastoral women had the responsibilities of domestic production as well as the education and raising of the children. Thus the extra stress and workload associated with their livestock management, which had been imposed as a result of range privatisation, was severely felt (J. Prior, 1992:87-88).

Labour Migration and Economic Diversification

Since the pastoral household is engaged in a complex series of activities—including farming, dairying, trading, and craft production—the amount of labour that can be devoted to herding is necessarily less than the number of able-bodied persons it contains (even allowing that very young children and the elderly may be pressed into service). Labour migration out of pastoral communities has grave repercussions on resource management, gender relations, and the health and nutrition of those who remain behind. While there is a good deal of data attesting to the labour intensity of pastoral herding, livestock-sector planners have frequently misunderstood the nature of pastoral workloads on dry rangelands, mistakenly assuming that the "land-

extensive . . . production activities in these areas are not also labour intensive" (Little, 1991:4).

Economic diversification and wage labour migration compound the problem, now reasonably well appreciated for settled agriculturalists, that labour constitutes a scarce resource, and the reduction in available labour for herding may force a reduction in the number of animals that can be maintained by the household, leading to progressive impoverishment.

The failure of pastoral production systems to support an increasing number of poorer households and the subsequent male out-migration has ramification for women's lives. The degree to which women become involved in herding and herd-related activities, the effect on their labour load, health, and nutritional status, are greatly regulated by their families' wealth and investment strategies, their household developmental cycle, and gender ideology. Families with substantial remittances may hire shepherds to compensate for pastoral labour shortfalls without increasing women's and children's labour loads (Adra, 1983), while those with meager access to men's income may be obliged to appropriate the uncompensated labour power of women, especially in the dry season. Male migration that is temporary or rotationally organized may not result in a labour shortage affecting animal husbandry (Morton, 1990). In her discussion of labour migration among Hawazma (Baggara) pastoralists, Michael (1991) notes that men seek wage labour not because herding no longer supports them but in order to earn money to purchase more animals. Because herding among these Sudanese people is carried out mainly by adolescent and young men, the absence of more mature men does not seem to increase the labour burden on those who remain. As they invest remittances in additional livestock, more milk is produced and marketed, which enhances the economic status of Hawazma women.

Among the Samburu of Kenya, where pastoralism has become precarious, combining herding with wage labour is increasingly the norm, with remittances either saved in the bank or

invested in real estate and other nonpastoral activities. The decision to migrate is influenced by both the economic status of the sending household and its stage in the development cycle (see Goody, 1962). According to Sperling (1985, 1987), poorer households and those whose livestock losses from drought have made some herding labour redundant, export labour. While some of the remittances may be used for herd reconstitution, most of these funds are devoted to grain purchases. Households in their early formative years tend not to have surplus labour. Since many of them cannot support themselves exclusively from herding, they often combine with other households at the same stage of development, pooling their separate herds under the care of a few shepherds while the other men leave to find work. Older migrants return to their pastoral households, where, to assure their being accorded the status appropriate to their age, they abide closely to Samburu rules of etiquette regarding loyalty, generosity, exchange, and moral obligation. Samburu women are less likely to migrate, and those who do leave to participate in food-for-work projects or in odd jobs on the fringes of towns find themselves estranged from the pastoral economy.

The problem of herd management in the absence of men may be compounded where an often rigid androcentric ideology restricts women's mobility, potentially conflicting with the land extensivity of pastoral production. The desirability of moving stock to often distant pastures, bringing herdswomen into contact with men from other households, lineages, and even tribes, potentially competes against the ideal of female seclusion, which insists that women remain close to their homes under the supervision of their fathers, husbands, brothers, and sons. In reality, the ideology underlying gender roles among Muslim herders may be negotiable (Antoun, 1968; Abu-Lughod, 1986). New technologies, such as large cisterns mounted on trucks (Chatty, 1990), may resolve part of the problem by bringing water to the herds so that the animals do not have to be moved to distant water points. Also, in the absence of male labour, herders may opt for less labour-demanding small stock—sheep and goats—in place of camels and cattle

(Birks, 1978, 1985; Cole, 1975, 1981). This pattern is especially observed in the Middle East where the demand for mutton has been rising. Israeli Bedouin, whose access to Negev pastures has been severely restricted by the imposition of military bases and agricultural schemes, have begun to feed sheep on residues from commercial food processing activities (Abu-Rabia, 1987) rather than on natural pastures. With the reduced radius of mobility, enforced by the state, women and girls have become more involved in herding without necessarily endangering family honor (Marx, 1986a, 1986b; Shoup, 1985).

The increase in women's responsibilities for herding has not usually brought about changes in the interpretation of customary rules that would grant them legal control over their households' livestock (Talle, 1988). Salih (1985), says that among the pastoral groups of Omdurman, Sudan, men's involvement in nonherding, cash-generating activities has added to women's domestic workload, including their contribution to livestock-related tasks, but women's control of the herd and its products has not increased. Dairy marketing is now done by male heads of households and through middlemen, which deprives women of their traditional rights over milk animals and participation in sales decisions.

Male labour out-migration and increased female participation in herding have not altered the basic pastoral division of labour where women are charged with domestic chores. Among the Bani Qitab of the Sultanate of Oman (Birks, 1978), male out-migration was encouraged by income-generating opportunities in oil fields. Temporary seasonal migration by men slowly gave way to permanent exodus. Initially, this labour migration was designed to supplement earnings from agropastoral activity, not to replace them, but cash income took precedence over interest in flocks and herds. Men withdrew from pastoralism, leaving animals under the charge of women, children, and the elderly. Most households have retained only a few animals for hospitality and religious obligation, not for subsistence. Even canned milk is now preferred to

fresh milk. Remittances have generally been spent on consumer goods rather than invested in ways to reduce local economic vulnerability.

The declining viability of pastoral economies may encourage the migration of all adult members of the household, as in the case of WoDaabe women from Niger who migrated with their husbands after the 1969-1974 drought (Rupp, 1976). This pattern has continued for the past 15 years. In December 1991, we observed WoDaaBe couples in the Podor region of Senegal: walking from FulBe village to FulBe village, the men sold charms and medications and the women worked as hairdressers. But the opportunities for women to be employed away from the herds are limited, although the data on sedentary and urban occupations of women who used to herd are not quantitatively persuasive. Watson et al. (1988 and 1989) report that some Turkana women who migrate to urban centres become prostitutes, while others try to eke out a living making charcoal and brewing beer. Many reports (e.g., Broch-Due, 1983; Jakubowska, 1984; Sørensen and von Bülow, 1990) describe how male out-migration and reduced income from pastoralism result in greater individuation of production and a contraction of the kinship arena within which individuals and households might find mutual support.

Men's absences from the pastoral household have affected women's statuses and relative autonomy at home and in the larger community. Most reports insist that as men migrate, women's workloads increase and their spheres of autonomy contract, but the data are not entirely consistent on these points. Some of these inconsistencies may result from researchers' interpretations, differences in household wealth, the intensity of adherence to indigenous gender ideologies that subordinate women's access to sources of autonomy, and the degree to which women depend on remittances for their livelihoods. While a few reports indicate (Lewando-Hundt, 1984) that men's absences from the household have broadened the arena of women's decision-making, most note that the decline in transhumant herding and the concomitant male

out-migration have increased women's dependency. For example, among the Tugen of Kenya (Kettel, 1986), increased participation of men in migrant wage labour resulted from privatization of land, reinforced by colonial taxation and settlement policies, and this was associated with differential access of men and women to property in livestock, cash, and land, and by a new pattern of power distribution in the household at the expense of women's domestic autonomy. The increased dependence of women on men saw a decline in traditional mechanisms of female solidarity, such as women's age-sets.

Male migration changes the ratio of men to women in home communities; and this is reflected in the marriage pattern and household structure: women marry at later ages; and an increasing number of impoverished, single mothers are found who have little legitimate claim for support from the men's kin groups and lineages. Matrifocality is becoming more common as men opt out of pastoralism. With the pastoral exodus, Turkana seem to be engaging in informal consensual cohabitation, rather than formal marriage, which is denying women entry to broader kin networks (Watson et al., 1988). Without holding the formal status of "wife," Turkana women cannot legitimately pursue claims to their mates' livestock or milk (Broch-Due, 1990). Brown (1983) reports that integration into the market economy, along with legal measures taken by the Botswana state that have favoured large landholders and cattle herders, promotes male out-migration, leaving behind many destitute unmarried mothers who receive little support from their mates' kin. Although the government has offered women such social services as education and health, the labour market favours men with better jobs and higher salaries. Women are further disadvantaged by not having access to plow oxen, which adversely affects productivity on their small farms. Finally, Monimart (1989) notes that as men leave the rural areas, women may be forced into marriages with men who remain behind. These are often wealthier men, not forced to emigrate by economic adversity, who are able to accumulate wives in exchange for cash.

The Commercialization Issue

A pastoral production system rarely focuses on a single product, but makes use rather of both "continuing" (calves, lambs, and kids; milk, butter, and cheese; transport and traction; manure; hair and wool; and occasionally blood) and "final" (meat; hides and skins) products.⁸ All of these may have both use and exchange values, although with the incorporation of pastoral economies into the world market system, increasing importance is being accorded to the ways in which these products generate income both for the producing community and for the nation. Although possibilities for expanding the arena of pastoral commercialization often appear attractive to development planners, there may also be substantial costs, especially those associated with greater social differentiation. While some producers clearly profit from sales, others, perhaps the majority, may find themselves further ratcheted into poverty or forced out of livestock rearing altogether.

Commercial Meat Production

With the exception of oil-exporting nations, countries with large pastoral populations tend also to be among the poorer and less-developed states, countries that are hard pressed to improve their external trade balances and to satisfy internal, mainly urban, demands for better and cheaper food. Herds present themselves as part-solutions to the need both to increase high-value exports and to provide urban populations with meat, and various donor-supported projects—such as stratified livestock production and supplemental feeding schemes in West Africa and ranches in East Africa—have been implemented to increase the volume of beef and mutton sold. Attempts at shifting from a subsistence dairy to a commercial meat orientation have met with little success, and have reaffirmed one well-placed observer's conclusion that "livestock development projects . . . have probably been the least successful subgroup among agricultural

projects" (Cernea, ed. 1991:217). Some of the meat-oriented projects, although ostensibly for the benefit of small-scale herders, in fact exacerbated social inequities.

The shift from subsistence dairying to commercial meat operations fundamentally affects the pastoral community in general and pastoral women in particular. First, there is a recurrent tension between the state's interest in livestock as a source of meat for urban consumption and for export, on the one hand, and that of pastoral communities who derive much of their subsistence directly from their herds, on the other. A successful beef or mutton-producing operation requires a high survival of male stock; both heifer and bull calves must receive adequate supplies of milk. For a pastoral community, raising bull calves on milk is a luxury to be enjoyed only after human hunger is satisfied, and during the frequent periods of low milk production male stock beyond herd reproductive requirements may be allowed to starve. That is, in the hierarchy of milk consumers, pastoral children in a subsistence dairy operation take precedence over male animals. "The resolution seems to be a compromise on calf/child needs by favouring the female calves ...[and] by eliminating a high percentage of male calves. Meadows estimates that 40 percent of male calves disappear before the age of 12 months throughout northeastern Kenya and Maasai rangeland, compared with only a 5 percent mortality for female calves" (Dyson-Hudson, 1991:236).

Shifting from subsistence dairying to commercial meat production tends to reduce the size of the pastoral population: ". . . commercialisation can lead to displacement of labour from poorer, subsistence-oriented pastoral households This loss of a work force of course further reduces the productive capacity of poorer households" (Sikana and Kerven, 1991:24).

Especially those with smaller herds settle as farmers or emigrate to other regions. The economic and social costs of rendering part of the pastoral population redundant are rarely taken into account in cost-benefit analyses demonstrating the economic advantages of increased

livestock offtake and reduced national dependency on meat imports for urban consumers. A more immediate consequence of the shift out of dairying is its adverse effect on women's normal authority over the management of household milk supplies—how much is allocated to animals, children, other members of the household, guests, and for marketing—which is compromised by the need to feed milk to male calves.

In commercial beef production, in which the male calf becomes a surrogate consumer of milk for the ultimate urban or foreign purchaser of its meat, women lose both the revenue from milk sales and the status attendant on making decisions relating to the family's food supply and household hospitality (Kerven, 1987). In a comment on the final design report for AID's Eastern Senegal Bakel Range and Livestock Project, Hooglund (1977:4) concluded that were the project to be implemented, "[w]omen would be left without an important labour input into the family economy and without control over family resources. As the status of women depends practically on their position in the subsistence system and symbolically upon the number of milking cattle at their disposal . . . , the status of women . . . would suffer."

③ Among Nigerian FulBe, women were responsible for the direct marketing of milk and milk products, while men were responsible for the indirect marketing of livestock, using professional brokers. Both dairy and animal marketing occur in the subsistence dairying enterprise; in fact, women enter the market more frequently than men. Although women's individual transactions are smaller than are men's, the aggregate sales by women contribute substantially to household income and therefore to women's status. Thus, even if total household income were to increase through an emphasis on beef rather than on dairy production—an often assumed though rarely demonstrated proposition—the relative contribution to that income from women would decline.

Disenfranchised from their traditional rights over milk animals, dairying, and marketing, women in beef production tend to be limited to caring for new-born animals. In stratified production schemes, where reproduction of young stock is the responsibility of pastoral herders who then transfer the animals to stations where they are fattened for sale or export, the labour of pastoral women is appropriated by wealthy ranchers and feedlot operators (Dahl, 1979:258; Dahl and Hjort, 1979). The profitability of commercial beef production is closely tied to the gender division of labour where responsibility for rearing young stock is assigned to women. Women's labour contribution to stratified production schemes is interpreted as part of their feminine role and therefore remains devalued and of low visibility, overshadowed by the dominance of men in these enterprises. While women may contribute heavily in the labour-intensive task of caring for the calves, their male relatives control income from sales to ranchers and feedlot operators. Excluded from the male-run animal marketing network, women even lose control over their own livestock as men will first sell off animals that belong to their wives.

Because of their divergent investment interests in the herd in meat-oriented operations, disagreements between spouses on the allocation of milk offtake arise with increasing intensity and frequency (Kelly, 1986; Michael, 1990; Waters-Bayer, 1988; Joekes and Pointing, 1991). Conjugal conflict over animal and human milk needs (Walshe et al., 1991:22) is most acute during the long sahelian dry season when milk yields normally plummet, but even in the rainy season there may not be a surplus of milk to allow for much human consumption.

Declines in milk availability force changes in the pastoral diet and in the amount of time women spend on food processing. Although herders always include some non-pastoral foods in their diet, a meat-oriented production system implies an increase in obtaining food from the market. Grain, vegetable oil, tea, and other comestibles become important components of the diet, and these are obtained for cash (Bahhady, 1981; Pouillon, 1990). Pastoral women continue

to be responsible for feeding their households, but the erosion of milk and dairy marketing increases their dependence on men to provide them with needed cash. As cereals become more prominent in the diet, women must spend more time in transforming the unhusked grain into meal and in obtaining fuelwood for cooking (Waters-Bayer, 1988). There are some indications that the dietary shift away from dairy produce negatively impacts on the health of both women and children (Loutan and Lamotte, 1984; S. Prior, 1989; Teitelbaum, 1980).

Commercial Dairy Production

If commercial meat transactions tend to marginalize women, would not commercial milk transactions enhance women's status and control, since the marketing of surplus milk and dairy products is normally within the women's domain? Although there is an interesting literature dealing with dairying in Asia (e.g., Bradburd, 1990; Bishop, 1989; Salzman, 1987), the Middle East (e.g., Chatty, 1978; Lancaster, 1980), and Africa (e.g., Ezeomah, 1985; Holden, Coppock, and Assefa, 1990; Massae, 1990; Rodriguez, 1987), the data are neither numerous nor conclusive. The thinness of the data on the African dairy trade is attributed by Little (1993) to its gendered nature. "Without males in the portrait, dairy trade was [to many observers] uninteresting, unimportant, and thus, unlikely to be portrayed." Little also notes that much of the successful dairy marketing takes place in periurban regions: "The perishability of dairy products necessitates a distance usually of no more than 40 to 50 kms from a market town . . . and this is the spatial band that has been ignored by researchers until recently." The inconclusiveness of the data is due in part to the fact that commercial milk production has not affected women uniformly; the potential benefits accruing to women from dairy marketing are mediated by a host of variables, such as location and distance to markets, government politics, economic status, and such logistical obstacles as inadequate infrastructure and refrigeration.

Where milk production generates a surplus above household and herd consumption requirements, women may benefit by taking it to local markets and to small-town processing centres (Herren, 1990; Kerven, 1987). Michael (1990), reporting on production and marketing of milk and dairy products in the Sudan, states that Baggara women participate in all stages of this economic activity, and that their incomes constitute two-thirds of total annual household budgets. The incomes generated are controlled by women, and often go toward the purchase of new stock or animal feed. Women's marketing links to various private and state cheese factories are facilitated by government pick-up posts and by a chain of middle women who sell the milk to retail sellers. Little (1989) documents the central role played by Somali women in camel milk trade both in large urban areas and small settlements. Pastoral women serving consumers' needs in small encampments may also engage in milk transaction in urban areas, where markets are dominated primarily by older local women traders who act as intermediaries between producers and consumers. The disaggregated nature of the milk market, the relative durability of soured milk, and the low initial capital investment facilitate the participation of distant pastoralist women in milk marketing, which allows them a degree of cash autonomy.

However, the potential gain from commercial milk production has not always been translated into financial empowerment for women. What seems to be a source of status and economic autonomy in subsistence herding may be co-opted by development policies that favour capital intensive dairy operations using powdered or concentrated milk imports from Western countries.⁹

Waters-Bayer (1985) reports that in Nigeria, where semi-sedentary Fulani women have been in charge of milk processing and distribution, dairy development efforts have concentrated on high-technology operations that process non-indigenous dairy products for urban consumers. Hindered by low milk output and discouraged by low prices offered by large dairy plants, Fulani

women rarely are willing to sell their milk to non-local markets. Absence of infrastructure and preservation technology has so far prevented most women's direct access to urban consumers. In rural markets fermentation techniques adopted by women solve the danger of contamination, and also combat the problem of lactose intolerance common in sub-humid areas.

Where the market response to pastoral products is positive, women's gain may further be differentiated by their class position. For example, the integration of the Komachi herders into the national economy of Iran was encouraged by the rising demand for mutton in excess of the national supply, by the population expansion, and by the government-subsidized wheat prices. Wealthy households' economic privileges were maintained through contractual control over the labour of poor salaried shepherds. Access to market was facilitated through middlemen who, by expanding credit to herders, controlled animal market exchanges. Large herd owners also had an opportunity to engage in dairying, a work done primarily by women. While rich herders did not participate directly in herding activities, spending their time in establishing business ties, their wives engaged themselves in milk and dairy marketing. The wives of poor herders were used, through informal exchanges of labour and reward, to assist rich women in their processing activities (Bradburd, 1990).

Because of tremendous local and regional variations, and because of the relative paucity of available information, it is clearly imprudent to draw general conclusions about the effects on women of increasing commercialization of pastoral produce beyond suggesting that as the scale of operation increases, control over the revenue from exchanges of meat, dairy, wool, skins, and hides shifts from women to men, and from producing households and local traders to powerful and remote corporations. There are entrepreneurial opportunities for women in these trades, but the data indicate that considerably more research is needed if larger-scale externally funded actions designed to benefit pastoral women are to have any chance of

sustainable success.

Conclusion

In the general impoverishment of pastoral communities, the social losses borne by women exceed those borne by men. As herds become too small to support households, men may migrate for wage labour, and while their self-image as failed pastoralists may be severe, they are still able to earn an income. Women's statuses depended on their critical contributions to livestock husbandry, and on their responsibility for distribution and marketing of dairy produce. Pastoral women rarely find their labour to be valued in nonpastoral arenas, yet development interventions have largely ignored them. Even where women are left by emigrant men with the bulk of herd management responsibilities, planners have tended to act as if they were economically irrelevant, and projects are rarely informed by changing gender relations of production. This bias toward seeing men even where they are clearly absent, while ignoring present and hardworking women, is probably reinforced by livestock department and project staffing which are almost invariably 100 per cent male.

In the past, pastoral studies had an almost exclusively male emphasis, focusing on jural responsibility for herd management. Far less attention was paid to women's activities regarding milking, dairying, food processing and distribution, small stock managing, animal health actions, and marketing. In the absence of detailed and accessible information about pastoral women, it is little wonder that they were slighted in development interventions that were directed by persons who frequently embraced an anti-nomad attitude. The new literature attests to the significance and diversity of women's economic contributions, especially as modern pastoral communities find it increasingly impossible to sustain themselves as subsistence herders and seek—or are forced—to diversify their productive activities in order to survive. Among the

recurrent events that are transforming gender relations of pastoral production are privatization or restricted access to strategic resources of rangelands and water; increasingly adverse terms of trade between pastoral and nonpastoral produce; economic diversification and wage labour migration, sometimes for both men and women but more commonly for men alone; encroachment on rangelands of game parks and agriculture, particularly large-scale irrigated and mechanized agricultural schemes, forcing livestock more intensively to exploit the only lands still available for them; closing of national frontiers to herders from other countries; government efforts to force herders to sedentarize or otherwise to constrain their mobility, to increase offtake, and to convert from dairy-based to meat-based enterprises. Rapid commoditization of the factors of pastoral production, in combination with the events listed above, weakens the ability of many herders to withstand periodic adversities of climate and disease.

The consequences of these transformations on women are frequently deleterious. When poverty and/or government policy forces men to migrate in search of income away from the pastoral area, women assume men's labour burdens in addition to their own, and frequently endure restrictions on their abilities to go on transhumance; when poverty and/or policy forces sedentarization and a shift from herding to farming, women must till the land, but they are discriminated against both in regard to land rights and access to markets; when dairying gives way to a concentration on beef cattle, women must care for the calves but no longer control the income derived from their labour, and theirs and their children's nutritional well-being is threatened. With the move to privatization, women's property rights and attendant status and economic autonomy suffer, as the state tends to acknowledge only male claims of ownership. Privatization also favours an atomization of labour groups, and so extended household compounds within which labour is often pooled are replaced by nuclear households.

Our understanding of the effects of these transformations on women is not firmly based

across the board. While the mechanisms of pastoral and agropastoral production have been well described in a large number of cases presented mainly by anthropologists and geographers, feminist theory has only recently informed on pastoral studies, and in-depth studies of pastoral women are relatively few and not evenly distributed throughout pastoral regions of Africa, the Middle East, and Central Asia. Planners must understand what is known about pastoral women, and also recognize the tentative and incomplete nature of the knowledge. Since participatory development cannot proceed without sound appreciations of our partners' social, economic, and cultural characteristics, it is imperative for these appreciations to be advanced and deepened by new research. The following list suggests the kinds of inquiry needed:

(1) What are the specific effects on pastoral women of the alienation of communal rangelands for agriculture, game parks, ranches, and other forms of private use, especially where women are not permitted to own land in their own name?

(2) What is the impact of social and ethnic conflict and warfare, as in Afghanistan, Somalia, Sudan, and Iran, on pastoral women? Not uncommonly, pastoral men become involved in these conflicts as combatants, leaving behind often unprotected women, children, and the elderly to herd animals on landmined pastures. How women cope with war and brutality in these situations has not been investigated, nor is there a solid body of material on pastoral women in refugee camps.

(3) What is the relationship between women and the processing and marketing of hides, skins, hair, and wool? It is remarkable how little solid data and analyses are available on this topic, and yet anecdotal material suggests that at least with wool and hair women figure prominently. This should be an important area of investigation because of the possibilities for small-scale entrepreneurial activities focused on women.

(4) How are pastoral societies in general and pastoral women in particular coping with the AIDS epidemic? What happens to pastoral societies with fairly rigid age and gender divisions of labour, when the demographic distribution is abruptly challenged by illness and death? Are there differences in the incidence of AIDS in pastoral and neighbouring agricultural societies?

(5) What labour alternatives exist for pastoral women when herding ceases to be viable? Are pastoral women recruited to particular kinds of employment, such as prostitution, domestic service, tourist industry staffing, craft workers? How does tourism—such as in East Africa and perhaps in the Central Asian republics of the former Soviet Union—affect gender ideologies?

These are only some of the questions that call for field investigations in a number of geographic areas. There are also specific regions where pastoralism is prominent but where scientific knowledge of pastoral production systems and of pastoral women is particularly weak: the Turkic, Mongol, and Farsi-speaking regions of China and former Soviet Mongolian Peoples Republic, Tuva ASSR, Khazakhstan, and the new republics of Turkestan. These may be the unique areas of the world where a reinvigorated pastoralism appears to be gaining momentum as state-managed collectivized herding structures are dismantled, and, in the former Soviet countries at least, there appears to be a receptivity to collaborative research between host and foreign social and environmental scientists. The United Nations Environment Programme can play a signal role in these efforts by encouraging research foci on pastoral and agropastoral women, and, in so doing, lay the groundwork for effective gender-sensitive development.

Pastoral women are too important to remain neglected by development planners or, worse, to have poorly informed development planning further victimize them. The great contribution of pastoralists—women, children, and men—to the economic lives of their countries

is that their animals convert the otherwise unpalatable graze and browse of semi-arid and arid rangelands into useful products (meat, milk, milk products, blood, wool, hair, skin, hides, transport, traction, and manure). Despite their ability to make sustainably productive land areas totaling some 50 million km² across the world (Sandford, 1983:2), much of it having little alternative productive use without tremendously costly and often environmentally disastrous transformations, pastoralists are increasingly among the poorest and least empowered of Third World populations. We hope that the discussions at this UNEP Workshop on "Listening to the People: Social Aspects of Dryland Management," by highlighting the importance of women's labour in pastoral and agropastoral production systems and by demonstrating women's frequent disenfranchisement from cultural and economic sources of autonomy, will alert development planners to the flawed assumptions that lead either to the total neglect of women or to undertakings that discriminate against them, and will facilitate the planning of gender-sensitive development actions that result in enduring improvements in pastoral and agropastoral well-being.

Notes

1. Dr. Horowitz is Director of the Institute for Development Anthropology (IDA) and Professor of Anthropology at State University of New York at Binghamton. Dr. Jowkar is a senior researcher at the Institute. They may be contacted at IDA, 99 Collier Street, Binghamton, NY 13902-2207, USA; tel. 1-607-772-6244; fax 1-607-773-8993; telex USA 932433 DEVANTHRO; E-Mail FAC398@BINGVAXA.

2. --and there is hardly consensus about the nature, causes, and extent of dryland degradation (Helldén 1990; Warren 1990)--

3. For a discussion of the impacts on gender of shifting from flood-recession to irrigated farming, see Horowitz and Salem-Murdock (1993).

4. This section draws heavily on research conducted by Dr. Forouz Jowkar and myself (1992) on behalf of UNIFEM and UNDP.

5. "Economic diversification" refers to the assumption by members of the household of activities other than maintaining their own herds, including farming, hired shepherding, trading, and wage labor. "Marginalization" refers to the compaction of livestock herding on areas of low biological productivity, to the worsening terms of trade between pastoral and nonpastoral produce, and to the pastoralists' political and jurial minority. "Social differentiation" refers to the growing economic inequality between herders and nonherders and to increasing stratification--by class and gender--within herding communities: "...most herders are becoming poorer, despite the relatively high value placed on meat, while a small number of livestock owners from pastoral communities are becoming rich and powerful and a perhaps larger number of rich and powerful men who are not from pastoral communities are becoming livestock owners" (Horowitz and Little 1987:61).

6. Because modern states rarely acknowledge pastoral land use as providing inalienable rights, grazing lands are often arbitrarily assigned or granted to agricultural use. In March 1991, the Government of Senegal transferred control over a 45,000 hectare sylvopastoral zone called Mbegué, which had been sustainably grazed by upwards of 100,000 animals belonging to 6,000 FulBe herders, to the Khalifa-General of the Mouride Islamic brotherhood. Responding to the Khalifa's call, disciples clear cut the entire forest within a few weeks, and the land was prepared for cultivation. "The government's decision to permit the transfer of 45,000 hectares used by agropastoralists to peanut fields controlled by the Mouride brotherhood is part of the larger trend toward privatizing communal pastures for individual and sedentary agricultural production. This negatively affects not only the agropastoral livelihood system of the FulBe, but also the environmental sustainability of the entire production system in an area only marginally suited for agriculture" (Schoonmaker Freudenberger 1991:2).

7. Efforts to limit pastoral mobility, to privatize rangelands, and to emulate North American and Australian ranching, ignore or discount evidence of the superior productivity of "traditional" pastoral production systems. Studies carried out by the International Livestock Centre for Africa (ILCA), focusing on yields per unit land rather than on yields per unit livestock, show that extensive herding on communal pastures provides the better return. According to Cossins, who has researched Borana herding in southern Ethiopia, their pastoral system "is very productive; compared with Australian commercial ranches in a similar climatic environment, the Borana produce *nearly four times* as much protein and *six times* as much food energy from each hectare" (1985:10, emphasis added). The cost of labor and capital invested also favors the Borana system:

The amount of US dollar investment required to produce one kilogram of animal protein is 0.14-0.28 for the Borana system, 2.01 for commercial ranches in Laikipia, Kenya, and 1.93-3.89 for Australian ranches. If production of food energy (milk and meat) is used as an indicator, the difference in benefits from pastoral production is even more outstanding (Horowitz and Little 1987:71).

Also published by ILCA, similar findings are reported for Botswana by de Ridder and Wagenaar (1984).

8. For a discussion of the gender implications of wool, hair, hides and skin marketing, see Horowitz and Jowkar (1992:47-9).

9. In Nigeria, the increase in urban milk and dairy consumption led to imports of powdered and concentrated milk. But in 1986 structural adjustment policies resulted in higher import costs. According to Di Domenico and Vabi (1988), the potential gains for pastoral women have been frustrated by inadequate infrastructure.

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**PARADIGMS CHANGE, BUT NOT AS QUICKLY AS
RURAL MIDDLE EASTERN WOMEN**

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Introduction

This paper briefly delineates the major approaches in the large social science literature used to analyze women's roles in the Middle East, and shows how these analyses may increasingly be incongruent with the complex and changing conditions of women's socio-economic lives. It argues that although in most urban areas of the Middle East women's economic participation may still lag behind other regions, the picture is rapidly changing in rural areas where an increasing number of women are drawn into the agricultural labour force as men migrate out. Women's assumption of new roles in agrarian sectors will have environmental consequences. Additional quantitative data on women's agricultural participation are needed to substantiate the qualitative anthropological information in order to encourage the planning and implementation of environmentally sound and sustainable development actions.

Discussion

Among the targets of criticism directed at the early crescendo of academic writings on women's lives has been the widespread assumption that women, as women, can be treated as a uniform analytical category. Such concepts as "the position of women," "the role of women," or "the subordination of women" in a society have overgeneralized without paying adequate attention to the diverse range of activities and subjective life experiences of particular women with particular socio-economic and cultural attributes. Probably nowhere in the world has the use of over-generalizing conceptual categories gained such popularity as in the Middle East. Founded on a history of adversity between the world of Muslim Orient and that of Christian Occident, the early literature on Middle Eastern women, almost exclusively written by male travelers, drew on a particular interpretation of Islam as a libidinous religion that reduced women to sexual objects at the services of men (see Said, 1978 for a discussion of the Western image of the Middle East). Later, the sterile dualism of traditional/modern, popular terms used to distinguish the West against the others, was vigorously adopted to define the Middle East as a culturally distinct region with its own inner rules of rationality alien to Western logic and practices. Although the differences between the Middle East and the West are indisputable, the mutual exclusivity of what traditional/modern entail masked the nuances of experience that the diversity of peoples in both regions have, and substituted simplistic description for inquiries into the complexities of social orders.

In harmony with the conceptual dualism of traditional/modern, such theoretical paradigms

as public and private domains and honour and shame were adopted — especially in anthropology — to deal with gender hierarchy in the regions. Women's exclusion from the male-dominated public world of politics and economics was interpreted in part to have emerged out of a context of resource scarcity and weak state power, prompting competition among different patrilineal groups who, by laying a high premium on female chastity, ensured the legitimacy of their offspring. Control of female reproductive capacity, prescribed through codes of sexual morality and formalized in religious dictums, was seen as a mechanism for maintaining group boundaries and access to resources (Schneider, 1971). The apparent physical segregation of men and women, buttressed by Islamic moral ideologies regarding each sex's activities, was often regarded as an expression of low female status in the society (Beck and Keddie, 1978:18; Dwyer, 1987:4-5; Youssef, 1974).

The literature about the domestic lives of women in the Middle East described how women drew power from their physical exclusion from the public life of men. In spite of references to the complementarity of the gender division of tasks in rural and pastoralist societies, however, by subsuming a wide range of women's productive activities under reproductive and domestic practices, the public/private model failed to account for the labour contribution of women in such undocumented areas as petty commodity production and commerce, domestic services, seasonal agricultural labour on family farms, or herding enterprises. By focusing on the domestic lives of women, the literature documented women's economic participation as much lower than in other parts of the developing world (see Boserup, 1970 on Muslim Women; Youssef, 1974). While it linked political and ecological imperatives

to a gender division of morality and labour, the theoretical focus on honour and shame ideology and public/private domains raised few questions as to how the gender division of labour is subject to change as a result of larger economic and political processes.

Influenced by debates on the effects of economic change on gender relations in developing countries, increasingly researchers interested in the Middle East have focused on the diverse range of productive activities involving women. Inspired by questions raised about the separation of concepts of production and reproduction, especially where women's domestic activities are commoditized or made invisible in the statistics, greater emphasis has been placed on women's productive roles in the changing economies of the Middle East (Fernea, 1987). Going beyond the static categories of public/private domains, a new genre of Middle Eastern and Western researchers, while conferring importance on the role of ideology, focused on the historical construction of the gender division of labour in the region (Glavanis, 1989; Shami, Taminian and Morsy, 1990; Morsy, 1991; Afshar, 1985; Moghadam, 1992). By circumventing such homogenizing terms as "the status of women," new data are disaggregated along the divisive lines of class and ethnicity, rendering information on the lives of women in the Middle East more accurate and less susceptible to stereotypes. The new researchers highlight the role of the state and the ideologies of nationalism and Muslim Fundamentalism in formulating social change that politicizes and changes women's roles (Hijab, 1988; Rassam, 1984; Afshar, 1992).

What emerges out of this evolving literature is that countries of the Middle East have different economic and political formations and that their incorporations into world capitalism

are uneven because of their diverse natural resources, strategic locations, and particular histories. Changes in the region have not affected all women uniformly; their integration into the process of development is a function of their class position, education, and a host of other cultural and regional factors (Mernissi, 1978; Berik, 1987; Abadan-Unat, 1981). The issue of women's integration into the process of development is by itself a thorny topic (Fuentes and Ehrenreich, 1983; Sen and Grown, 1987).

A quick glance at limited data from the Middle East illustrates fast-paced changes in the rate and patterns of women's economic participation. The most striking of these changes is the increase of working age women in the formal labour force. In the mid-1970s, the percentage of economically active women in the Muslim Middle East was less than half that in non-Muslim countries. Although the gap narrowed in the 1980s, the female labour force in the Middle East remained lower than other areas (Mujahid, 1985; ILO-INSTRAW, 1985).

With the expansion of investment resulting from the rise of oil prices, women in the Middle East formed a larger proportion of the urban labour force, occupying positions in the service and industrial sectors, although simultaneously with a general increase in urban unemployment and underemployment (Moghadam, 1992: 94). Because the more industrialized nations of the Middle East—such as Iran, Turkey, Egypt, and Algeria—relied on import substitution industrialization, the bulk of women's industrial employment was in low-technology cottage industries, leaving the heavier manufacturing to the male industrial labour force (Moghadam, 1988). Except in Israel, low representation of women in sales and service work

may reflect the cultural sanctions not favoring close contact between females and unrelated males and the long-standing domination of men in traditional urban markets (Mujahid, 1985). Women's involvement in the paid labour market is influenced by their education, making upper and middle class more prominent in the upwardly mobile professions in administration, health, and welfare jobs that are mostly administered by the state. Lower class women's involvement is a function of their education, concentrating them in low paid and frequently undocumented sectors of agriculture, service, and urban employment (Moghadam, 1992).

Advances in information on women's economic participation in urban areas of the Middle East have been followed, however less intensively, by studies on gender relations of production in agriculture, on how gender is implicated in changes in environmental management, on links between contemporary resource use and the marginalization of women, and on the involvement of women in social movements organized to solve rural environmental problems.

Despite the rarity of macroeconomic data, an FAO report of 14 different countries estimates a varied and increasing range of women's agricultural participation in the Middle East. The documented trend in macroeconomic data on women's participation in agriculture may not indicate the full range of female farm labour, in part because some countries—such as Pakistan, Iran, and Syria—do not disaggregate their data by sex, or count their female agricultural labour force at all.

Female Percentage of the Total Agricultural Labour Force
in Selected Countries of the Near East Region, 1950-1985.

	1960	1970	1980	1985
Iran	5.0	9.4	41.0	41.0
Iraq	2.0	5.3	41.0	41.0
Jordan	3.9	4.1	0.9	1.1
Lebanon	17.5	22.7	32.2	37.7
Libya	1.7	7.2	16.00	17.7
Morocco	2.8	10.4	14.1	16.0
Oman	3.1	2.9	2.9	2.6
Saudi Arabia	3.8	3.8	3.2	3.2
Sudan	23.3	23.3	24.1	26.4
Syria	9.2	13.4	27.4	27.5
Tunisia	1.5	5.5	19.9	20.8
Turkey	49.9	48.9	51.6	54.3
Yemen AR	4.6	5.5	9.4	10.2
Yemen PDR	11.2	13.9	13.0	13.6

SOURCE: FAO, "World-wide Estimates and Projections of the Agricultural and Non-Agricultural Population Segments, 1950-2025," Statistical Analysis Service, Statistical Division, Economic and Social Policy Division, FAO, Rome, 1986.

Neither anthropologists nor farming systems researchers have provided as careful analyses of women's agricultural and pastoral labour in the Middle East as they have in Sub-Saharan Africa, South and Southeast Asia, and Latin America. Because available information is more qualitative than quantitative (FAO, 1984:29; Adra, 1983: 15; Myntti, 1979:53; Tavakolian, 1986; Beck, 1978), development planning in the Middle East continues to be heavily informed by anecdotal and stereotypic information about gender relations of production. Even

where anthropologists have been more directly involved in such planning, their recommendations tend either to focus on improvements in the domestic lives of women that do not confront claimed cultural values, such as providing opportunities for women in market sewing and handicrafts (Chatty, 1984), or to perpetuate gender-based economic inequalities by deemphasizing women's access to the means of production (Salem-Murdock, 1990:124).

Biased underestimations of women's contributions to rural production systems are a feature not only of Western models of explanation, but also of Middle Eastern officials' interpretation of what women do and own, even though government personnel may informally acknowledge the importance of women's work. Authoritative denial of women's farm labour participation contributes to a paucity of policies and measures needed to improve women's productive skills and opportunities. For example, in the Islamic Republic of Iran, government officials working with a World Bank range rehabilitation project involving nomads frequently mention the dire living conditions of pastoralist women, their arduous daily labour, hardship of trek, dismal hygiene, and rampant illiteracy. But the government's primary interest is in providing training and services for men, even though women, by virtue of their involvement in milking and dairying, contribute significantly to herd and community welfare. Because of an assumption that men are the primary providers for their households, women's income-generating potential in dairying is neglected, despite the project's subsidiary goal of increasing dairy output. Instead, much of the planned training for women will be in carpet weaving, a trade infested with male middlemen exploiting vulnerable weavers. Cooperatives promoting fair wages for women's weaving activities are very few, and those in operation do not reach pastoral women.

Following the World Conference on Agrarian Reform and Rural Development (WCARRD), FAO supported ten national studies seeking information on female labour participation in rural economies of the Middle East. Results showed that women, in addition to processing and storing food, participate in the subsistence needs of their families in cropping, harvesting, sacking, thinning, planting, re-planting, irrigating, manuring and fertilizing, furrowing, spraying insecticides, axe-weeding, leveling, and even ploughing (see Delancy and Elwy, 1989). Pronounced inter- and intra-regional variations in the female agricultural labour force and types of activities may be a function of seasonality, farm size, male labour migration, and cropping patterns.

Quantified results of studies similar to FAO's are essential to substantiate the qualitative assertion of the new genre of anthropological studies describing male and female labour complementarity in reproduction of daily lives in rural and pastoral economies of the Middle East. Although the notion of gender complementarity in the recent literature on women in the Middle East has been awakening, it has not sufficiently alerted foreign and indigenous male development practitioners to systematically advance the involvement of women in development action. To be effective in policy making, further information on the economic values of women's contribution to agriculture, much of which is in the form of unpaid family labour, is essential. Focusing on indicators for measuring time use and productivity is important to shed stereotypes about the absence of women from agricultural production and management of resources in the Middle East.

Low and even negative rates of economic growth in the Middle East have resulted from declining oil revenues, rising national debts, protracted wars, the rise of an Islamic fundamentalism that discourages both domestic and international investment, and rapid population growth linked to women's low scholarisation and participation in the formal labour market. Governments have had to depend increasingly on external financial and technical assistance. In the agrarian sector, occurrences of environmental degradation contribute to declining land productivity. Despite the pressing need to feed rapidly growing and demanding populations, many governments are in fact adopting policies to increase agricultural exports in order to reduce national debts. Achievement of a satisfactory increase in per capita food production has proven elusive, however. After modest improvements in the 1970s, due in part to expanding the amount of farmland and in part to the application of new technologies, per capita food production in the region showed a 0.6 percent decline between 1980 and 1984, as new land was no longer available and the costs of new technologies began to exceed their returns (Delancy and Elwy, 1989).

Most states in the Middle East are new and postcolonial, and their power has been consolidated through such processes as repression, control of family life, and the imposition of measures that formalize traditional and often complex relations of property and access to natural resources. Examples of such policies are the state-orchestrated destruction of communal land use, namely *hema*, in Syria, and the nationalization of the range lands in Iran under the Reza Shah. In the 1970s the Syrian government restored the *hema* system (Draz, 1978). Nationalization or privatization of communal rangelands is one of the ways that states strengthen

their grip on their populations, for it facilitates tax collection from and political control of the users, as it changes the agrarian systems from subsistence to commoditized production. Formal restriction on the use of the rangelands is usually accompanied by a number of changes such as reduction of areas available for herding, intensification of animal production, and expansion of farming, all in part resulting from population growth. These processes have both a direct and an indirect bearing on the gender division of labour and access to resources.

In Morocco, while herding and farming were components of a single production system in which pastoral lands were communally available while access to farmlands was on an individual basis, a series of changes is reducing the area available for herding and forcing the intensification of animal production. Other changes include population growth, expansion of farming, rapid privatization of lands, increased production for the market, shifts from cereals to orchards that do not facilitate grazing, technological changes, and, especially, male labour migration to urban Moroccan centers and overseas. As commercialization affects livestock production there are changes in herd composition—especially a movement away from goat husbandry—and farmers must produce more fodder crops to keep animals close to the farm (Bencherifa and Johnson, 1990). "Increasingly this alfalfa-cattle loop is operated by the women, who characteristically remain at home while men are away. It is the women who cut the fodder, care for the cows, and conduct the milking operation" (ibid:407).

With the decline in agricultural production and the accelerated increase in the prices of goods, services, and food, an increasing number of men in the Middle East migrate to cities and

3) overseas in search of employment. As did the interregional migration of the 1970s and 1980s between oil-rich and oil-poor countries, male rural out-migration affects the local gender and age division of labour, with women, children, and older men carrying the burden of new responsibilities. Like other women worldwide, these women are the de facto heads of their households without enjoying ownership rights over property, yet their labour contribution to the agricultural sector is unprecedented.

Islamic laws recognize women's ownership and disposal rights over such resources as land, trees, water, and livestock. In part because of discriminatory inheritance laws that grant women half of what men inherit, and in part because women's property rights may be abrogated by their male relatives (Pastner, 1978), Middle Eastern rural women have few enforceable rights over the ownership of resources. Women's access to resources, however, may be informal (Moors, 1989) and subject to interpersonal negotiation and to class status (Abu-Lughod, 1986). Where states establish legal codes and issue titles for the use of resources, women often get shortchanged.

In its attempt to counter land degradation and avoid problems associated with spontaneous settlement of herders on the fringes of towns, the Islamic Republic of Iran is launching a programme of planned nomadic settlement. Despite the informal acknowledgement of Iranian officials as to the importance of women's contributions to the economy of nomadic households, land ownership on government-sponsored settlements will privilege only men. Interviews by the author with spontaneous settlers clearly indicated the increased role of settled women in

agriculture, yet officials resist any legal transfer of land to women or to unmarried men. While unmarried men may migrate to cities in search of employment, women remain on the land as household dependents without rights to apply for loans or credit, even in the event of their husbands' death; male relatives of the deceased are said to be the guardians of widows and their orphans.

Changes in the gender division of labour and, therefore, in women's relation to resources are, of course, conditioned by the migrants' economic class and amount of remittances, the tenure system, the household development cycle and women's age, the flexibility of extended patricentric households, and the women's individual responses to change. Marx (1986), reporting on Bedouin of South Sinai, points out that when men migrate to work for wages, women and children are obliged to tend flocks and gardens. In the local systems of meanings and interpretation, women's new responsibilities are not considered "work," yet men performing the same functions are regarded as working. Michael (1991), in her research on the impact of male out-migration on Baggara women of the Sudan, describes how because of the economic autonomy of Baggara women, who draw cash from dairy marketing activities, the income generated by labour migrants is used to expand their livestock holdings or to purchase gifts for a wide network of relatives who will act as a security buffer in case of environmental calamities.

Male out-migration and changing gender relations directly impact environmental management and resource extraction. In his evaluation of development-related demographic

studies of the Sultanate of Oman, Birks states that the consequences of male labour migration include sedentarization with increases in agricultural activities based on water extracted by pumps. While women are taking a wider and more active role in labour and decision making in small gardening, a decline in the number of camels and a relative increase in the number of goats and sheep is made possible by the feminization of pastoralism. Male out-migration has also resulted in a decline in the viability of both the pastoral and agricultural sectors and the destruction, because of labour shortage and neglect, of capital investment in irrigation systems (Birks, 1976, 1985).

In Yemen, where rainfed agriculture is practiced, women's agricultural activities have increased, adding a burden to their reproductive responsibilities. Forced to plough and repair terraces, women cultivate fewer fields and raise fewer livestock. On the other hand, with tubewell irrigation, lands formerly unsuited for intensive agriculture have come under cultivation of vegetables traditionally planted by women (Adra, 1983).

In the past, the availability of labour ensured resource productivity. Despite the drawing of women in the absence of men into new areas of productive activities, there may be a drop in productivity. Women are rarely eligible for credit, loans, and other state-funded inputs (such as fertilizer and insecticides) necessary for sustained productivity. Access to such other services as extension and training in agricultural production is also limited for women, either because training in agriculture offered by governments and development agencies is male exclusive, or because few female agriculture extension agents work in remote areas. The subjects most

available in extension training are sewing and handicrafts that can be performed by women in the houses, which reinforces the stereotypes about women's separation from the public domain of production.

Because of its discriminatory policies against women's education in agriculture, the Islamic Republic of Iran is now facing a shortage of female extension staff for implementing its joint project with the World Bank on natural resource management that simultaneously attempts to rehabilitate the rangelands, improve herd productivity, and increase herders' income. With pastoral sedentarization and the growing involvement of herders in farming, it is unlikely that the goal of increasing household income will be possible to achieve if the growing role of women in agriculture is not addressed. Because settled herders are obliged to increase their herd offtake to counter environmental degradation, women will also lose on their traditional access to wool from their family herd.

Conclusion

Although the social science literature on Middle Eastern women may be rich descriptively, its dominant paradigms fall short of explaining the complexity of socio-economic changes in gender relations. Such processes as integration into the global market, wars, and politicization of ideologies of nationalism and Islamic fundamentalism bring about variations in the extent of women's participation, but without doubt Middle Eastern women are becoming important players in the labour force, especially in rural areas. By assuming an expanded range of responsibilities,

women are emerging as environmental managers, frequently without the *de jure* property rights that legally qualify them for access to the resources necessary for increased agricultural productivity. As the goal of feeding the growing populations in the Middle East can only be reached by environmentally sound increases in land productivity, governments and planners can no longer afford to plan and implement agricultural policies based on stereotypes. For the fragile and precious natural resources in the Middle East to be productively sustainable, women's labour in the agrarian sector must be acknowledged, and serious policy actions must be taken to enhance their legal and actual access to factors of production and channels of marketing and distribution.

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**THE IMPACT OF SOCIAL AND ECONOMIC CHANGE ON PASTORAL
WOMEN IN EAST AND WEST AFRICA**

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Introduction

The literature on women in pastoral societies in Africa is relatively limited when compared to the vast body of research on women in agriculture in the same region. Although more attention is now being paid to the role of women in the pastoral economy, most of this literature is in the form of case studies, and different authors have tended to pursue different facets of women's position. Recently, efforts have been made to analyse this literature to develop a wider perspective on pastoral women in Africa, as well as in other parts of the world (Joekees and Pointing, 1991; Horowitz and Jowkar, 1992).

This paper draws on a number of case studies to investigate the impact of social and economic change on pastoral women in East and West Africa. The limitations of the literature makes it difficult to attempt any systematic comparison. For this reason a different approach is adopted, focusing on the similarities between the two regions. There do seem to be much stronger similarities than differences in the position of women in pastoral societies, in terms of traditional rights and entitlements and the gender division of labour.

The paper takes as its starting point recognition that pastoral societies are not isolated entities; they interact with and are in many respects fully integrated into the national economy. The crucial contribution of women's work to the success of the pastoral enterprise is also acknowledged. As such, they are neither removed from nor immune to the wider changes which are taking place.

The division of labour in pastoral societies

An overall division of labour between women and men is prevalent in pastoral societies, although there are variations between groups and shifts do occur over time. The prevailing view of pastoral men's and women's roles has tended to ignore these complexities: men's work has generally been associated with herd management and women's work with the children and house. As a result the extent of women's involvement with livestock has frequently been underestimated. In fact, the balance of work is such that women frequently spend more time than their husbands in animal care (Talle, 1988:11).

① Women are closely involved in caring for young and sick livestock as well as for animals kept near the homestead. As "milk managers" they are responsible for milking, processing milk products and marketing of dairy produce. Women also perform all domestic chores including food preparation and collecting firewood and water. They are responsible for child rearing and usually for food provision. Nomadic women also dismantle and rebuild their houses when the herd is moved to new pastures. Men's responsibilities as herd managers include moving, feeding and watering the herds, castration, vaccination and slaughter, building enclosures and digging wells. Senior men are responsible for planning

and decision-making with regard to livestock, while junior men and boys perform most of the physical labour and herding.

Despite overall similarities, variations occur in different cultural and economic contexts. For example, where social convention constrains women's mobility, as among the Tuareg, it is men rather than women who go to market and make household purchases (Oxby, 1978:284). In contrast, where this convention does not apply, as among the Maasai, women have greater freedom of movement and are more involved in the sale of milk products (Talle, 1988:226).

As has been observed in agricultural settings, shifts in the division of labour are often associated with male consolidation of control of assets which are increasing in value. While women retain their traditional involvement in small-scale dairying, men are more likely to become involved when it becomes a larger-scale, more profitable activity (Talle, 1988:227-8). There is a tendency for men to become involved in house construction as sedentarisation encourages the building of more permanent structures (Talle, 1988:252). This may benefit women by relieving them of the on-going and time-consuming work of house building and repair, but it also excludes women from ownership of an important asset.

For the most part, however, the direction of change has been towards women taking on formerly "male" tasks. This is attributable partly to a shortage of household labour due to greater mobility and the involvement of men in waged employment. The decline in household size and coherence has also reinforced women's work burdens. Evidence of increased involvement of young wives in herding activities in some areas has been related

to the breakdown of residence structures into smaller units and greater self-sufficiency of the family (Talle, 1988:251). These additional labour demands are placing a heavy burden on many women.

Livestock Entitlements

The central importance of livestock in pastoral regions derives from the high-risk nature of the environment: the mobility of animals makes them less vulnerable than crops to localised drought. As livestock are pastoralists' means of survival, they play a central role in the economic, social and cultural lives of pastoral societies. The complexity of livestock rights is demonstrated by the fact that different people often have different rights vested in the same animal (Broch-Due et al., 1981:253).

Women are associated with livestock as the means of subsistence as "milk managers", a role intimately connected to their reproductive and household provisioning roles. As milk managers women control the distribution of milk between animals and humans. This balancing of animal and human needs was the crux of a successful pastoral enterprise, and the decisions taken by women with regard to milk off-take were critical to the well-being of both (Talle, 1988:251).

Rights to milk depend on women having a reproductive role, as child-bearing establishes a woman's claim to milk. Milk and milk products can be used in a variety of ways: for consumption within the household or for exchange and marketing. Whether marketed, exchanged or consumed at home, milk products contribute directly to household

welfare. Women usually have the right to retain any cash generated by the sale of dairy produce. The evidence suggests that this income is generally used to meet household requirements rather than for personal consumption. Women also utilise their dairy management roles to build up their own social networks, either by giving dairy products to other women or by allowing them the use of one of their own milking animals. In this way reciprocal links are built up to maintain the flow of food into the house during periods of stress (Kettel, 1988:8).

Women also own animals, sometimes even large herds. These are often obtained at marriage and also through inheritance, although women usually inherit less than men. Women frequently leave their animals in the care of their brothers. As it is from brothers that women derive support after the death of their father, this can be understood as an instance of asset dispersal and strengthening of family obligations that can be drawn on in times of need (Baroin, 1980:3). Market transactions involving livestock are usually controlled by men, although they cannot freely dispose of animals in which women or children have rights (Kettel, 1988:10).

Although herd management is a male domain, women are often involved in discussion and decision-making relating to livestock, especially if they or their children have rights to particular animals. In this way women play an important role in safeguarding their children's interests in livestock. While ownership and ability to freely dispose of livestock is circumscribed by male management of herds, their traditional rights to animals do provide women with certain assets and a degree of leverage which can be used to their advantage in both the shorter and longer term (Kettel, 1988:9; Talle, 1988:248).

Certain changes taking place in the pastoral economy are fundamentally altering women's rights and access to livestock. In some areas, sedentarisation and degradation of grasslands means that the herds tend to be kept at cattle posts in remote areas, away from the homesteads. Furthermore, the growing importance of beef production and marketing of animals is adversely affecting women's property rights in livestock. There is an increasing tendency for men to appropriate women's rights to livestock without negotiation or permission as was traditionally required. Women now complain that their animals are among the first to be sold (Ensminger, 1984:64). It has been argued that commercial livestock transactions have made it possible for men to redefine or disregard traditional rights accruing to women and children (Talle, 1988:266).

The growing emphasis on commercial meat production as opposed to dairy production has particular consequences for women's household provisioning responsibilities. Little of the income from commercial meat production "trickles down" to women even though they retain their traditional responsibilities to feed their children (Kettel, 1988:11). At the same time, diminishing supplies of milk means they either have to allocate less to household needs or sell - and earn - less. In either case, a reduction in the supply of milk has negative implications for household nutritional status and women's labour time.

Women have demonstrated their resourcefulness in adapting to and stretching diminishing resources. Diluting milk or adding value to milk products through processing are ways women maximise earnings from reduced quantities (Waters-Bayer, 1985:16). However, this usually demands greater time and labour input, particularly of poorer women who are more likely to be involved in food processing as a source of cash income.

It does not necessarily follow either that a greater contribution by men to household provisioning will improve household nutritional status or reduce the labour demands on women. Women and men often have quite different priorities for cash expenditures and household needs. There is frequently conflict between spouses when expenditure on food or distribution of milk is controlled by men. Women complain about men's reluctance to pay for household requirements and their expenditure on drink, or that they do not receive sufficient milk to meet the household's needs (Talle, 1988:265; Waters-Bayer, 1985:7; Nestel, 1985:198).

Common Property Resources and Use Rights

Land use in pastoral societies was traditionally governed by a complex and sophisticated set of rules and institutions, which provided access to vital although often precarious resources. The cooperative use of resources can be understood as a means of minimising risk in a climatically unpredictable environment: the spatial and temporal variability of precipitation and consequent vegetative cover without regard to land boundaries is a defining characteristic of pastoral arid lands. The pastoralist strategy of maximisation and dispersal of assets was an adaptive mechanism to these circumstances which permitted survival in times of crisis and allowed for economic regeneration.

The use of land by pastoralists as a common property resource has come under increasing pressure. Large tracts of pastoral land were appropriated during the colonial era, while in more recent years the creation of national parks has been accompanied by

restrictions on pastoralists' use of this land. Population increase and growing land pressure has also led to encroachment by the agricultural sector onto rangeland. The greatest loss of commonly-managed land, however, has occurred through the adjudication of grazing land into private ranches and farms. Typically, usufruct rights based on residence are replaced by legal formalisation of group or individual ownership of land.

The privatisation and individualisation of land is a critical change in the rural economy, and has far-reaching implications for poorer households and women in particular. It has been argued that the creation of group ranches intensifies social and economic stratification as they have an inbuilt tendency towards the creation of wealth. This is because even if equal grazing quotas are allocated to members originally, those with more starting capital are likely to lease or buy quotas from other members (Hedlund, 1979:33).

Furthermore, group ranch membership is almost entirely male. It seems that pastoral women experience discrimination similar to that faced by women farmers in sub-Saharan Africa, where land is usually registered in the name of the male household head regardless of who actually farms the land or makes the greatest economic contribution to the household. Women are as a consequence excluded from access to loans and extension services which are usually determined by land title. In this way important productive resources become concentrated in the hands of men (Staudt, 1975).

Substantial changes in utilisation rights to water sources are also occurring with the development of wells and water tanks to provide permanent water supplies. It is becoming common for access to water to be marketed, either for cash or in exchange for livestock.

Even water for human consumption is being sold. Previously water was regarded in the same way as pasture and every household had the right to draw water for animal and domestic use. Now, women tend to accumulate water debts during the dry season which they pay off when milk - and therefore their cash income - becomes more abundant (Talle, 1988:53). It seems that women become responsible for domestic water costs when what was previously a free resource is transformed into a transactable commodity.

Environmental Degradation

The multiplicity of women's tasks involves them in a close interaction with and dependence on the natural environment in a number of ways, in collecting wood and water, and foraging for both animal and human consumption. There are therefore particular repercussions for women - especially poor women - as a result of diminished availability of rangeland resources.

Degradation of pasture land increases the amount of time that has to be spent caring for young, sick and feeble livestock which are kept at the homestead. It is women who are responsible for collecting water and fodder for these animals. This work is particularly time-consuming in the dry season when more animals are in a weakened condition, and at the same time there is a greater scarcity of fodder (Dahl, 1979:64). Degradation of the pasture lands contributes to the deterioration of both animals and fodder supply, a combination which considerably increases the burden of work on women.

Any deterioration in the quality of grazing is rapidly translated into a reduction in

milk yields. Pastoralists are therefore extremely sensitive to differences and variations in pasture because they can monitor marginal differences by measuring milk output. Pasture degradation has a particular impact on women by further reducing the milk supply which is so critical to household provisioning.

Wood shortage is another aspect of resource depletion which has particular repercussions for women. Women are responsible for collecting firewood and often for housebuilding. These have become increasingly time-consuming and tiring tasks as longer distances must be walked to find and gather sufficient firewood and construction material.

③ The shortage of wood is exacerbated by two trends which have increased demand. Firstly, as sedentary women tend to build larger and more numerous houses than nomadic women, more wood is required for the building and repair of their homes (Ensminger, 1984:65). Women often have to travel great distances to find wood suitable for house-building. Secondly, the dietary shift from milk to grain has increased the amount of cooking fuel required by households (Ensminger, 1984:65). Purchasing fuelwood is one way of responding to the shortage for those who can afford to. For poorer households reducing energy consumption is often the only option. Shortage of firewood can therefore have a major influence on the nutritional status of poorer households, as women cook fewer meals or turn to foods which are nutritionally inferior but which require less cooking time (Bradely, 1991:220).

Land privatisation and environmental degradation also result in restricted availability of wild foods such as berries, fruit, plants and roots. Many of these resources are also

important for medicinal and other purposes. Wild foods are mainly collected and eaten by women and children, and provide valuable additional nutrients to an often unvaried diet (Talle, 1988:56; Broch-Due, 1983:173).

Nomadic women face additional problems, as a deterioration of the rangeland necessitates more frequent moves to find new pasture. House-moving is women's responsibility, and more frequent moves means that this activity becomes much more time-consuming (Dahl, 1979:64). Conversely, where women's time is already overstretched the household's mobility is constrained. It has been suggested that shortage of labour sometimes leads to detrimental changes in management practices. Where the demands on women's time have become very severe the mobility of the main camps and their associated herds of milk animals may decrease (Dahl, 1979:86).

The evidence thus indicates that environmental degradation contributes significantly to women's work loads while reducing their capacity to meet their household provisioning obligations. It suggests that the extra time many women have to spend in subsistence activities such as gathering wood, water and fodder reduces the amount of time available for other economic activities. For poor women, or those with limited access to resources, the impact is likely to be even greater.

Conclusion

Analysis of the situation of women in pastoral societies in East and West Africa indicates that there is a remarkable consistency in both the social and economic transformations which are

taking place, and the impact of these processes on women. There are further parallels between the situation of women in agricultural and pastoral societies.

Increased monetisation of the rural economy, commercialisation of production and adjudication of common property resources into private ownership are contributing to the breakdown of traditional entitlements and obligations which formerly governed social and economic relations. Women's traditional rights have proved to be vulnerable in the face of these changing social and economic conditions. This vulnerability can be related to the fact that women's traditional rights were usufruct rights, while ultimate control of resources was invested in men. Now, changes in the pastoral economy which have intensified competition for resources have led to women becoming excluded from access to productive assets. At the same time their work burdens are becoming heavier as their own workloads increase and they take on more of the tasks previously carried out by men.

Among pastoralists as in agricultural societies, allocation of tasks and responsibilities as well as access to natural and other resources are largely determined by gender. Pastoral women carry major responsibility for household provisioning and child rearing, as well as being substantially involved in livestock care. It is their involvement with livestock which forms the basis for much of women's social and economic support. Yet as the importance of subsistence milk production declines in favour of commercialised meat production their claims on livestock and livestock products are weakened. As a consequence many women are finding it increasingly difficult to meet their household provisioning obligations. This difficulty is compounded as the status and limited authority conferred on women through their close involvement with livestock is undermined.

While there are remarkable similarities in the changes taking place in pastoral societies, the impact on individual women and men varies in different contexts. The processes of change are filtered through an existing set of social and economic relations which means that some women are better placed than others to respond to increasing demands or new opportunities.

Policy Guidelines

The foregoing analysis suggests a number of areas where interventions could usefully be developed. However, it should be remembered that the analysis focused on the similarities in the processes taking place in the regions surveyed. One such process has been an increase in social and economic stratification among pastoralists. These widening social and economic differences, when added to variations in environmental, cultural and political conditions, make application of universal solutions impossible. I would argue that to be effective interventions must be developed with the full participation of the intended beneficiaries.

Four main areas for action have been identified:

1) Safeguarding women's access to productive resources. Access to productive resources must be protected as the system of entitlements breaks down, to prevent women being marginalised as previously common property resources become individualised assets. The extent of women's involvement in both pastoral and agricultural production is now widely recognised. If, as is commonly argued, individualised ownership increases the incentives to maintain productive resources, there are sound environmental (as well as equitable) grounds for ensuring that women are not excluded from the process. Further, concentration of land

ownership in the hands of men and the exclusion of women has been identified as an impediment to investment in the land by those who work it, as discussed above.

a) Ensuring that women are included in the land registration process is an immediate priority. Title should be protected through laws governing marriage, divorce and inheritance.

b) Women's ownership of livestock should be protected in the same way.

c) Extension and veterinary services should be made accessible to women through i) training female extension workers to work specifically with women, and ii) training village women as livestock and agriculture specialists, working on a cost recovery basis.

d) Providing women with access to credit and savings facilities, taking account of women's lack of mobility, lack of ownership of assets which can be used to secure loans, and generally good record as borrowers and savers.

2) Reducing the amount of time women spend on domestic labour. This would reduce the time constraint many women face and thereby increase the time available for income-generating activities. However, care must be taken not to displace poor women who earn income by performing these tasks for wealthier women. It should also be recognised that domestic tasks do not necessarily represent drudgery for women - household maintenance is often an area where women have a degree of autonomy. Freeing up time for more involvement in income-generating activities may not benefit women if it means as much work plus a tightening of male control over their labour and its proceeds.

Four main areas have been identified:

a) Provision of water points for domestic use would mean a considerable saving of women's time and energy, in addition to reducing poor household's expenditure on water and improving health standards;

b) Easier access to fuelwood would save collection time and curtail environmental damage. The creation of village woodlots, where practicable, could also provide employment for poor women. Alternatives to woodfuel, and the use of energy efficient stoves, should also be investigated in collaboration with the women who are to use them;

c) Access to maize-milling facilities could result in a major reduction in time spent on this arduous activity, particularly for poor women (as poor households are more dependent on grain as a staple). This could involve small-scale individual household mills, or larger-scale fixed mills in villages which are within reach of a large number of women for most of the year. This would also have the potential for providing employment for some women, and opens up the possibility of marketing grain-based products for women with limited access to milk. Improved processing would have the additional benefit of making grain more digestible, with positive implications for the health and nutrition of children in particular;

d) Attention could also be given to ways of reducing the amount of time nomadic women must spend dismantling, rebuilding and repairing their houses through better access to building materials or design innovations, again with the full participation of women.

3) Improving income-generating opportunities for women, by

a) Strengthening existing areas of involvement. Women's involvement in small-scale dairying should be encouraged and supported, as a means of providing for their families and maintaining their traditional rights to and involvement in the herds. The benefits to women of involvement in their own dairying business, as opposed to selling to commercial dairies has been demonstrated. Assistance can be given in the form of provision of clean water, improved transport and roads, improved processing and containers. Support of women's dairying enterprises should particularly aim to enhance women's control over their own labour and the proceeds derived from it.

(4) b) Developing new opportunities. The need for increasing alternative income-generating opportunities for women is indicated by the growing dependence of pastoral households on non-pastoral income, and the declining availability of milk both for feeding their families and marketing.

4) Enhancing women's involvement in decision-making. -Efforts should be made to enable women to retain control of their earnings which research has indicated are largely spent on improving the welfare of their families. This could be achieved by promoting existing areas of women's involvement and control. Women's management and marketing of milk products is a good example of the benefits to be derived from involvement in the whole production and marketing cycle. The study does however indicate that there is a scale problem: as such enterprises become larger and more profitable they become vulnerable to appropriation by men. Collective enterprises by groups of women might be one method of overcoming this.

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A VIEW FROM WITHIN
MAASAI WOMEN LOOKING AT THEMSELVES

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Introduction

The following paper is based on experiences in a project implemented within the Elangata Wuas Ecosystem Management Programme by the local Maasai self-help group, the National Museums of Kenya and Kenya Wildlife Service.

The main reason for this project - also called "photo-appraisal" - in which Maasai women themselves are taking photographs of positive and negative aspects of their lives, was the fact that for a long time the literature created the myth of powerless pastoral women (Merker, 1910; Hollis, 1970; Arhem, 1989). Male researchers as well as male informants underestimated women's involvement with livestock, and their background-influence in decision-making processes.

A possible reason for this kind of superficial analysis may be the fact that the female sphere, especially in Maasai society, is not directly connected with the public, not directly approachable from outside. The problem of approaching women is based on their special role

within the society. An overall division of labour as well as of responsibilities pushes the women into a background position with regard to public affairs, and eventually creates inhibitions to discuss certain subjects with outsiders.

Most researches and investigations dealing with Maasai culture are based on the structural organization of Maasai society, regarding the hierarchical division within the age-set system as social reality, and as a main guideline to collect information (Jacobs, 1973; Evangelou, 1984).

Women and girls are, however, separated from the male age-set system and are not seen as a communal group, but as individuals, and have therefore no official function within the political system (von Mitzlaff, 1988:73). This may lead to the wrong conclusion that women play no role in public life. Nevertheless, there are women having a position, defined responsibilities and duties within the community, and they have their own opinions, which are worth investigating.

A process of active involvement in which attention is not focused on the individual woman, but on a focal point away from the individual (the photo) helps to overcome inhibitions, and to create a relaxed atmosphere in which fruitful discussions can take place. Even if some authors claim that women are often involved in discussions and decision-making, at least regarding livestock, my personal experience shows that they are not really used to discussing community affairs within a group. The main objective is it therefore to create a situation where women can get used to discussing topical and general problems in a group.

The Process

In several *enkengs* (settlements) in the whole area of L'oodokilani (Kajiado District) women were asked to participate in the project. In each *enkang* four women were asked to take photos with disposable cameras. At the beginning of each photo-activity a discussion took place about the issues to be tackled (positive and negative aspects in the life of Maasai women) and about the possible realization of the relevant subjects. After the women identified the subjects and the way of representing them, they then took the photos themselves.

After the photos have been processed another discussion takes place, this time about the motivation to take a certain photo and about the subject touched. One photograph at a time is shown to the same group of four women. The women should identify the represented problem and talk about their attitudes and their feelings regarding this problem.

At a certain point, when four or five groups of women have already taken part in the project, a workshop is organised, in which the women discuss the presented topics with each other. Individual opinions on single aspects are given, and potential solutions for specific problems within the group are discussed.

Female Perspectives

To gain a certain knowledge about culturally determined attitudes, and interactive processes

between individuals and the environment, it is necessary to recognize the cultural variability of personality and therefore of perception patterns. The traditional way of "seeing things" and the knowledge concerning certain environmental aspects can be expressed very clearly by taking photographs and talking about their realization and meanings.

The Maasai way of perception reflects the characteristic elements of their cultural and personality patterns and therefore offers the possibility to get information which not only includes the intellectual process of interpretation, but also gives a visual impression of the "cultural points of view". Issues of course vary with the given outside situation. Main issues presented in the photographs are the time-consuming and tiring female tasks: fetching water, collecting firewood constructing houses, care for livestock.

Previously water was regarded as communal property. Every household had the same right to draw water for domestic and animal use. But what was previously a free resource has now in many cases become private owned property. Women not only have to walk far to get water for domestic use, especially in dry seasons, but obviously become responsible for the water costs, which they try to pay for through their "milk-income". Since any deterioration in the grazing quality is directly measurable in the reduction of milk yields, water debts are accumulated during dry periods.

The availability of wood is another problem in household management. Women are responsible for collecting firewood and housebuilding and therefore any shortage of wood due

to degradation has particular disadvantages for women.

The above mentioned female tasks are mainly regarded as a problem during dry seasons. During rainy seasons water is available from small dams in the neighbourhood of the *enkang*. No long walks are necessary. House construction is not carried out in these periods, but mainly during dry periods. During the wet seasons women are permanently busy with smearing and plastering leaking roofs. Many Maasai women would prefer to live in concrete houses rather than to live in the *enkaji* (traditional house). Such houses would release them from perpetual mending.

The building of modern houses even affects the traditional division of labour. Responsibility for modern housebuilding is gradually being taken over by men. However, Kenya Maasai men have not begun to do physically demanding work of collecting and putting up the poles which support the house. Instead they employ workmen, and still sometimes rely on their wives. Obviously rights of property of a modern house are in the hands of men. This means a change in the position of the house as the centre of the female domain.

Wet seasons raise other kinds of problems to deal with. An important task is represented by the struggle against ticks. Not much governmental support is available to purchase the necessary veterinary medicine to prevent tick fever and other diseases. Since care for livestock falls under the female responsibilities, the women have to remove the ticks by hand.

Cash income could resolve some of these problems, but the women complain that they have been more and more excluded from control over family resources, and therefore have less possibilities to earn money by selling livestock products. Because of the wide range of their responsibilities, and their close connection to the natural environment, women have very concrete ideas about environmental management.

Among women there is a noticeable opposition to subdivision and privatisation of communal land. Maasai men get influenced by outsiders, who lead them to believe in the positive aspects of subdivision by showing them photos of green pasture and fat cows. Women clearly define the borders of reason and feasibility. (Talle, 1988:52 ff.)

Subdivision would leave many families with pieces of land not large enough to sustain their herds. Movements of herds would be stopped. Land degradation would increase due to the concentration of cattle in certain areas, and land would be sold to outsiders. The only positive aspect mentioned by the women would be the increase of male responsibilities to take care of the land. Herding cattle on community land demands few responsibilities in land management, except to change pasture when grazing is exhausted. The possibility of moving on with their cattle releases men from trying to prevent overgrazing and soil erosion, which they would have to do if the land was their private property.

Female awareness of these problems seems to be much higher than that of men, but the multiplicity of women's duties does not allow them to spend much time on the issue of land

degradation. It can be established that land privatisation and environmental degradation contribute already significantly to women's work load. Efforts should be made to allow them to break this vicious circle.

Another positive issue which is often mentioned with some concern is the cultural sphere. Being "Maasai", keeping the traditions, and performing rituals and ceremonies is seen as positive. Maasai ceremonies are said to have always been celebrated in the same way, and they are reminders and remainders of the old times. Many women appear to be concerned because Maasai men who lose their economic and political base often adopt habits and norms which differ from those valid in the pastoral context. Lack of recognition and destitution are factors contributing to the increasing drift of Maasai men to towns and trading centres. The "town boys" are very often regarded as "lost Maasai" - they are not proper Maasai in the sense of being "cattle people".

Gender Relations

General notions like "the role of women" have often been used to describe the female part of a given society without paying adequate attention to actual life experiences of individual women and their socio-economic attributes. There are two particular statements which characterize the different views of the "female role" within Maasai society quite well.

On one hand there is the statement of the German captain Merker, emphasising the

subordination of Maasai women:

"Fuer den eigenen Mann ist die Frau besonders the Arbeitskraft, wolche er fuer Haushalt und Viehwirtschaft braucht, und das Mittel zur Erfuellung seines Wunsches nach einer moeglichst grossen Nachkommenschaft. Danach, wie sie diesen Aufgaben gerecht wird, richtet sich ihre Behandlung. Maewssige Pruegel sind nicht selten, rohe Behandlung kommt dagegen fast nie vor.... Im oeffentlichen Leben steht die Frau, ebenso wie ihrem eigenen Mann gegenueber rechtlos dar". (Merker, 1910: 120)¹.

On the other hand there is the more complex image of the ethnologist Fosbrooke:

"It is important for a number of reasons to know who holds the purse-strings in a Maasai family group, but it is a question to which no definite answer can be given. Rules, where they exist, are seldom followed - in such intimate family matters it is personality that counts." (Fosbrooke, 1948:47)

This area of tension between patriarchal structure and daily life experience has to be taken into account, with reference to the actual gender relations.

As Merker pointed out, gender relations are ideally characterized by control (*aitore*) of men over women's labour, sexuality and fertility, with the consequence that women have limited rights with regard to their own persons and bodies. Maasai society defines only two informal

age-categories of women, the uncircumcised girls (*entito*), and the circumcised (married) women (*enkitok*); whereas men are organized in three formal age-sets defining the hierarchical structure of the whole society, with the elders as holders of responsibility and power (von Mitzlaff, 1988:75).

Each male age set is subject to certain behavioural rules which are extended to the female part of the community. Women have to follow the rules that govern male consumption of food and male sexuality, being able to gain social status only by becoming a mother (Arhem, 1989:11).

Apart from this ideal organisation of Maasai-society, women play an important role in the community concerning labour, trade, child rearing, etc., and have as individual persons a good insight into communal affairs and environmental problems. Often outsiders tend to divide Maasai-society into a male domain, which concerns mainly livestock management, and a female domain concentrated on the house, limiting their own view on reality (Evangelou, 1984; Arhem, 1985).

The findings within the described project have shown that women have many duties connected with livestock, e.g. care for sick animals, herding of small stock, removal of ticks etc. They also have special rights in livestock and livestock products. Women may not own livestock in the Western sense of "property", but in the Maasai sense of "property" they do. Within Maasai culture there is a strict separation between the notions of "property" and

"control". Several people (including women) may hold rights to the same animal simultaneously - and are therefore involved in decision-making regarding its sale - but only one person has "control" over the animal; thus rendering Maasai property rather diversified and complex.

This example of livestock management proves that it is not possible to draw a clear borderline between male and female domains. Rights and duties as well as influences have to be seen against the background of theoretical norms, and in the context of the actual situation and individual experience. In the present situation, however, the influence and the involvement of women in decision-making concerning livestock transactions and land management is actually diminishing, creating a situation that corresponds ever more to the previously ideal gender relations.

The increasing importance of livestock cash transactions and the reduction of subsistence herds diminishes the partial control of women over livestock. The control that Maasai men have over their wives' labour is becoming indisputable, and they are getting a firmer grip on the distribution and allocation of livestock and livestock products (Talle, 1988:250) Consequently the position of women within the pastoral production system is constrained by new principles of organization, viz. land tenure and livestock marketing practices, which give precedence to male activity.

Conclusions

Gender relations mainly appear as static, and the dominant position of men is often taken as a status quo in the absence of analysis.

Women are often presented in terms of their function within male dominated institutions. The lack of analysis of basic relations can often be explained by the fact that mainly male observers and researchers report. Gender relations and female tasks require more female investigation. At the same time there is a need for self-presentation of socio-cultural perspectives, a need for confrontation with individual personalities and the multiplicity of social action. An outside observer always runs the risk of including his/her own cultural background into his/her observations.

The presented method has proved to be effective with regard to the quantity and quality of information that can be collected.

As soon as the women get used to sitting together and discussing community issues, they can be fully integrated in the process of evaluation, interpretation and implementation.

In the present situation, monetisation of the rural economy, increased need for cash - income, and privatisation of land lead to the diminishing influence of women in livestock management and therefore to limited rights within the society. This means a change in the actual situation of women, but not a change with regard to the ideal female status within Maasai culture. Even if women suffer from an obvious loss of freedom and self-determination, the

present situation seems to be moving towards the ideal cultural norms.

Diminishing influence in economic processes and reduced access to family resources increase the need of women for other sources of cash income. This need, the increasing workload, as well as the apparent understanding of environmental issues and community affairs makes it necessary and worthwhile to involve women in the process of finding solutions to the problems. The aim should be to overcome women's separation from the public domain of production and decision-making.

Notes

1) Translation:

For the man, his wife is mainly important as a source of labour, looking after the household and livestock, and she is the guarantee for a high number of descendants. She is treated according to the fulfillment of her duties. Moderate beating is not uncommon, brute force almost never occurs..... The woman doesn't have any rights, neither with regard to the public domain, nor towards her husband.

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REPORT OF THE WORKSHOP
"LISTENING TO THE PEOPLE: SOCIAL ASPECTS OF
DRYLAND MANAGEMENT"
14-17 DECEMBER 1993

International Institute for Sustainable Development
Winnipeg, Canada

Summary

The Desertification Control Programme Activity Centre (DC/PAC) of the United Nations Environment Programme (UNEP) hosted an international workshop, "Listening to the People: Social Aspects of Dryland Management", in Nairobi, Kenya from 14-17 December 1993 that brought together nearly one hundred social scientists, government and non-governmental representatives, and UN representatives. The specific objectives of the workshop were: to find ways of implementing relevant recommendations in Agenda 21 involving social aspects of dryland management; to give programme guidance to institutions, including UNEP's DC/PAC, dealing with dryland management; and to provide inputs into both the Commission on Sustainable Development (CSD) and the Intergovernmental Negotiating Committee for the Elaboration of a Convention to Combat Desertification (INCD).

The participants met in working groups and plenary sessions through the week, in an exchange of experience, research and views. Presentations were made on: traditional and western natural resource management techniques; participatory approaches to research, project planning and management; land tenure and common property resources issues; gender issues in dryland management; donor activity; government policies; and environmental refugees.

The common themes that emerged from these sessions were incorporated by the participants into a set of recommendations that included strategies to combat desertification and follow-up actions to the workshop. These were debated and agreed to by the participants at the end of the meeting.

A common theme throughout the workshop was that meaningful strategies to address land degradation have to result in fundamental changes to power relations between the various actors at international, national and local levels. In particular, effective communication channels are needed to enable affected communities in drought prone areas to express their needs and development priorities. Such channels would enable communities to negotiate with representatives of other groups and governments whose interests and activities impact on their livelihood.

Governments were urged to create an enabling environment for true bottom-up development through stressing a popularly based development strategy. Suggested actions included a review of inappropriate policies and legislation and the creation of conducive market conditions. Participants called for reform in land tenure rights to be based on protection of existing systems of ownership, with guaranteed security of access to land to encourage proper

management of resources.

The group noted that a prerequisite to the planning of any intervention in a local community area is to recognize existing indigenous knowledge and management institutions and structures, including knowledge of production, consumption and marketing. In particular, governments and the international community should support efforts by local communities to develop environmentally sustainable marketing systems for renewable natural products from dryland areas to counter exploitative activities tending to degrade them. On gender issues, participants stressed that mechanisms for promoting women's equal participation in the decision making process should be supported and their productivity and independent income generating capacity strengthened. In a series of follow-up recommendations, the workshop participants suggested that: UNEP seek partnerships with governments, NGOs and international donors to carry out the group's conclusions; and that NGOs and social scientists, with donor support, help to sensitize "developers" to the socio-cultural factors of natural resource management. The Workshop Recommendations appear in their entirety as an appendix to this report.

Days One and Two

A series of papers were presented in the first two days, seen in the Programme included in this publication. Discussions of the presentation contents were held both in working groups and in plenary sessions. Provisional recommendations emerged from these

discussions. The third and fourth day papers are not presented in this publication, but a summary of their contents and the discussions that ensued can be found in the following sections.

Day Three - Morning Plenary: FOCUS ON DONORS

This session, chaired by David J. Whaley, UNDP Resident Representative in Kenya, consisted of a panel discussion with representatives from various multilateral, bilateral and international organizations and UN agencies including: UNDP, World Bank, FAO, SIDA, IDRC, USAID, UNSO and UNEP. The session began with two presentations from the Swedish International Development Authority (SIDA), on their experiences in funding soil conservation projects in Africa. Michael Ståhl, head of SIDA's Regional Soil Conservation Unit based in Nairobi, highlighted some crucial issues in Eastern Africa including the need to maintain soil fertility in the face of rapid population growth and intensive agricultural methods. Land pressure forces peasants to transfer to the drier lowlands, where their farming methods aggravate soil degradation. SIDA funded programmes were established to teach farmers how to improve their agricultural methods and incorporate conservation measures such as agroforestry. He noted that the programmes had been successful leading to the formation of the regional conservation unit to share experiences with neighboring countries. He observed, however, that the programmes had not been widely successful in the drylands.

Ståhl pinpointed stumbling blocks to sustainable agricultural production including: ill-defined property rights; lack of appropriate, easy to adapt technologies; and the need for assured income from conservation measures. He identified some direct benefits of soil conservation programmes

such as strengthening of extension services through training and encouragement of information sharing and technology transfer among the countries in the regional programme, and from farmer to farmer. He stressed that training is crucial and called for incorporation of conservation techniques in regular extension work. He said that SIDA is co-operating with the Kenyan government through post-graduate training programmes.

Jöran Fries related the experiences of the Swedish Sahel Programme in communal afforestation projects in the three West African countries of Burkina Faso, Senegal and Niger. He said that the project had started by distributing eucalyptus, acacia and neem tree species to farmers from central government tree nurseries. The limitations of this approach were acknowledged and the project has become more flexible with farmers now choosing the most suitable species for themselves. Additional conservation measures such as agroforestry and the dissemination of improved woodstoves, have been incorporated.

Fries noted that the greatest lesson learned from the project is that afforestation in itself cannot stop degradation. He stressed the importance of flexible projects based on the farmer first principle and utilizing the Participatory Rural Appraisal techniques.

Discussion: The Chair observed that the overall context of the donor environment, due to the redefinition of the role of the state in both donor and recipient countries, has provoked a crisis in government financing and a crisis in public confidence in the government to provide services. This crisis provides an opportunity for change to more direct participation, putting the farmer

first. One participant emphasized that what farmers need is a range of choices to enable them to cope with risk. He stressed the need for technical diversity that would transfer autonomy to resource managers by enlarging their choices and capacity to cope. In response to a question regarding project sustainability given lack of government funding, Ståhl said that although soil conservation is a priority for the Kenya government, they have yet to direct financial allocations to the programmes. Regarding a question related to providing manuals, Ståhl said that a balance needs to be struck between useful local knowledge and what must be brought in from the outside. On the Swedish project's provision of eucalyptus and a question if this was "forced" on the people, he said that he was unaware of any criticism of eucalyptus and that the people wanted it and used it for fence posts. He also said that participation of local people in project formulation is a political problem and that donors should avoid becoming involved.

In responding to the same set of questions, Fries said that the use of traditional knowledge is not always relevant given the change from shifting cultivation and the need for increased production on the land. He stressed the preference of using natural growth forest over planted forest for firewood. Other donors also responded to issues raised in the SIDA presentations and ensuing interventions. UNSO mentioned that their project formulation was done on the basis of government priorities. SIDA noted that their West African projects were initially government proposed, but are being adapted with time as constraints have been identified.

The discussions raised some points about soil conservation and regeneration strategies. UNSO called for the use of hardy indigenous plant species, especially fruit bearing trees in tree

planting projects. FAO mentioned the "food for work" concept and told of several examples of reforestation and agroforestry projects with food being brought in to compensate people. A case of regenerative tree planting schemes with the use of several species of almost extinct tree species in Burkina was also mentioned. In further discussions on the issues raised, Kenya's District Focus Strategy was singled out as having great potential for empowering local communities, if properly used. The importance of giving the decentralized development committees autonomy over the use of development funds was stressed. USAID mentioned attempts through a new policy to try to increase funding to NGOs.

Responding to concerns expressed about whether listening to the people also includes listening to women, UNDP said that many past disaster programmes have not taken into account gender dynamics and have thus neglected women's needs. He said that a joint UNDP/UNIFEM programme has been started to look at the special needs of women in crises situations.

Panel Discussion

In setting out the issues the Chair pointed out that donors operate within the context of priorities already set out for donor funds. He listed two main criteria for funding. One is the categories of donor inputs which are ranked in order of priority from peacekeeping and military interventions to humanitarian relief, development aid, balance of payments aid, food aid, other forms of emergency assistance, technical cooperation, and advocacy. The second consideration is the channels for administering the funds, which are also ranked in order of prominence from

multilateral development banks, bilateral donors, international organizations, and NGOs.

Dr. Nay Htun, Deputy Executive Director of UNEP, spoke on the concept of additionality of financial resources and the Global Environmental Facility (GEF). There were problems during the UNCED process in establishing the base figure to be used to determine the additional resources needed. The GEF is nearing the end of the pilot phase and GEF negotiations for restructuring and replenishment are ongoing, since no agreement was reached at the last round of talks in Cartagena. The next phase of the GEF should be replenished to 2.5 times that of the pilot phase. Htun felt that it was possible to demonstrate linkages between the four focal areas of the GEF and the management of fragile arid and semi-arid lands, particularly given the linkage between greenhouse gases and the generation of methane in these lands. Another possible linkage is the biodiversity that exists in the soil.

Some participants raised the issue of the size of projects to be funded by the GEF. The importance of rendering the large multi-lateral projects accountable to local communities was also raised. Several donors pointed out that recipients projects tend to be large due to the global nature of the fund. However, they explained that there are various options available for NGOs and communities seeking GEF funding. UNDP talked about their administration of the GEF Small Grants Programme and gave Africa 2000 programme as an example of the options available. Htun said that the independent evaluation has concluded that the GEF projects carried out so far are evenly distributed around the world.

OTHER ISSUES RAISED: On popular participation, participants called on donors to ensure that their projects incorporated genuine community participation at all stages. In response to this, UNDP pointed out the importance of government capacity building, which should not be ignored as this creates the enabling environment for communities to work. On collaboration between the different partners in development, it was stressed that donors and governments should be more flexible so as to respond to changing socio-cultural realities. The importance of culturally relevant training and information dissemination programmes was also iterated. On project formulation, USAID noted that project design paradigms have shifted and people at the grassroots are now routinely involved in all stages of design and implementation. Some participants wondered if current institutions have the capacity to mobilize communities in projects. As a starting point, it was suggested that projects to study the process of community participation through a project's cycle be launched. These would come up with guidelines for monitoring community participation. On the role of NGOs, there were varying points of view. The importance of accountability to both donors and the communities they represent was raised. However it was stressed that political and social accountability should be accorded as much weight as financial accountability. Some participants felt that NGOs are not legitimate community representatives and instead called for bona fide community organizations to be involved in development activities. The example of India's local government system and Uganda's resistance councils, where policy is formulated at the grassroots, were given as models for community empowerment. Nevertheless, some participants pointed to the crucial role played by NGOs' development programmes at community level and in bringing crucial issues to international attention.

Day Three - Afternoon Plenary: FOCUS ON GOVERNMENTSMEXICO

Manuel Anaya-Garduño presented his paper, "Socio-Economical Aspects and Dryland Management for Sustainable Development in Mexico" and spoke on the Mexican Plan of Action to Combat Desertification. He stated that 65% of Mexico is arid or semi-arid. In his paper he included political decisions made in the interest of urbanization and industrialization as a cause for desertification, and stressed that overgrazing, deforestation and dryland agriculture are results of these policies. He said that Mexico has established pilot projects with the objectives of research, demonstration and training at various levels with plans to strengthen extension services. He noted that there are no limits to technical solutions to desertification, so the problems are socio-economic. He remarked that the selection and application of technologies in Mexico will be based upon: the education and motivation of the local population; the availability of well trained personnel; and the levels of investment and time dedicated to the recuperation of specific areas under the process of deterioration. He said that the Plan of Action to Combat Desertification should be incorporated into the national plan of development, and the implementing agricultural and social development departments. Amongst other basic considerations he raised were: the need for long-term approaches with periodical evaluation; the need to promote a national, state and municipal technical information network to allow for exchange of experiences; and the need to reinforce capacity building through community participation.

Discussion: Points raised included the difficulty of incorporating socio-economic aspects into the information base, which has been set up at the national level and the need to restructure the numerous existing institutions for greater efficiency.

BOTSWANA

Seeiso D. Liphuko of the National Conservation Strategy Agency spoke about Botswana's experience in natural resource management. He said that the issue of land tenure is usually oversimplified, whereas in reality it is deeply rooted in the socio-cultural make-up of communities and cannot be addressed by legislation alone. He gave the example of the policy of free access to water, which leads to misuse of the scarce resource. Similarly, common ownership of grazing land has led to land degradation as people have no incentives to invest in conservation activities. He noted further that the government had introduced common law leasing of land to enable people to sell it. However the new law has not had any substantial effect in halting degradation. He said the government is now reviewing its policies to put in place management tools based on incentives such as improving extension services and including subsidized artificial insemination services to improve cattle breeds. The government also works on maintaining high prices for beef to encourage pastoralists to sell off their excess stock. Other measures being undertaken include: an integrated rather than sectoral approach to conservation to avoid ambiguities; and the provision of incentives for the private sector to engage in conservation activities. Botswana is taking part in a case study for the Desertification Convention.

Discussion: The point was raised that it is not clear whether commercial ranching has addressed

land degradation effectively, although common law leases have enabled people to make land improvements. It was pointed out that studies have shown that traditional pastoral systems without outside interference do not degrade the land although Liphuko noted that in Botswana's case there are many traditional practices such as shifting cultivation that do not work due to population pressures.

MALI

Yacouba Doumbia from the Ministry of Environment in Mali spoke of the problems faced by his country, where 58% is desert or semi-arid land and 30% of the land is strongly threatened by desertification. Mali's land ownership structure has gone through three periods, from pre-colonial, through colonialism with centralized land ownership, and the independence period when state monopoly over land was reaffirmed. Since 1991 Mali has initiated reforms that allow for the free management of decentralized land and made revisions in the land tenure code. The Ministry of Environment was asked to make pastoralists more secure by guaranteeing them access to pasture and water. Mali is taking part in one of the case studies initiated by the INCD Secretariat and the results will be transmitted to the INCD, the CSD and the OAU.

Discussion: In response to a question about the actual process of land tenure transfer under the new charter, Doumbia said that in the absence of legislation the old laws are in force and there has been no official transfer to decentralized areas. The Chair mentioned the problem of coordinating the implementation of projects in Mali and hoped that the Convention would help them introduce coordination mechanisms.

SYRIA

Adnan S. Shuman, of ICARDA, stated that the bulk of land in Syria receives less than 200 mm per year of rain, and only 10 percent of the land is irrigated. The government has met the challenge to increase production per unit area through new farming techniques, more rational use of the land and water resources, and more favorable government policies. Syria has a settlement policy for Bedouins. Shuman highlighted a series of policy recommendations for the areas of land tenure, access to resources, decentralization of political decision making, provision of extension services, provision of credit facilities and government involvement, which are included in his paper, "Government's Policies Regarding Rural Communities in Syria". These include giving local peasant associations the responsibility to organize the use and conservation of common natural resources and decentralizing policy decision making through the application of democracy.

Discussion: Shuman was questioned about the trend to settle pastoralists and replied that the policy was instituted to control and help them. The discussion period was cut short due to lack of time.

INDIA

T. K. A. Nair, of the Ministry of Rural Development in India, presented the situation in his country. The reordering of agrarian relations toward an egalitarian social structure spurred the freedom movement in India. There has been success in eliminating intermediate tenancy, conferring land rights to a large number of tenants and redistributing land to millions of landless

poor. Nair said that in light of the globalization of the world economy and the viability and levels of production of small farms, these policies are now the subject of some debate. He wondered what the role of NGOs will be as democratically elected local governments become more effective instruments for change in the local areas. It is the definite policy of India to encourage NGOs to undertake development activities, particularly in areas of land use.

THAILAND

Chartree Chueyprasit, Director of the Office of Environmental Policy and Planning, spoke on natural resource management in his country. The rural environmental problems in Thailand include land degradation, deforestation, water shortages and reduction of biodiversity. The country is in the seventh five year National Economic and Social Development Plan, which aims to promote more equitable income distribution and rural development as well as to enhance the quality of the environment and natural resources. It was developed together with all sectors of society, including NGOs. It specifies clear development targets and defines the role of all involved in the development process, including the private sector. He said that in addition to a bottom-up approach there should be capacity building and environmental education. Both a bottom-up and top-down approach should meet at an appropriate point in the efficient management of the environment. He encouraged the training of trainers.

Day Four - Morning Plenary

Jon Martin Trollaldalen, of World Foundation for Environment and Development, presented his paper, "Environmental Refugees and Migration". He said that displacement of people by environmental disasters is a growing problem that needs to be addressed. Migration of these people is caused by natural disasters, degradation, involuntary resettlement, industrial accidents, and the aftermath of war. He cited cases of conflict and resulting migration that have occurred in dryland regions, such as the clashes over resources between Senegalese farmers and Mauritanian pastoralists.

Trollaldalen said that despite the evidence of hardship experienced by environmental migrants, there has not been concerted international action to address the issue. He attributed this mainly to limitations in the definition of refugees and noted that there are increasing numbers of internally displaced people who do not satisfy traditional eligibility criteria for refugee status. As a result, environmental migrants are usually regarded as economic refugees. UNHCR policy, for example, accords them only relief assistance and not protection. He said the definition of refugees should be expanded to reflect the plight of people who are forced to leave their homes for life-threatening environmental reasons. Further, the definition should not be limited to persons who have crossed an international border, as this excludes the high number of internally displaced refugees in many countries. He said that a legal response to the problem should reflect both the right of access and refuge in a country other than the one of origin, and the standards of treatment for those seeking refuge, within the framework of universally accepted human rights

and humanitarian law. Possible solutions should focus on prevention as well as remedy, in particular voluntary return. He said that ecological disasters and degradation are seen as temporary causes of displacement and that third country resettlement and integration of migrants are unlikely to be accepted by governments worldwide. He proposed that the INCD recommend actions that would: pay attention to the increasing displacement of people for environmental reasons; focus on mitigating the driving forces behind the displacement; recognize the displacement as a severe human problem, and therefore the need, and regional arrangements for, assistance and protection.

Discussion: It was pointed out that drought is short term while degradation is a long term process, and that countries may only accept refugees fleeing from temporary drought conditions. Trolldalen noted that drought can be a symptom of degradation. Co-ordination with institutions that monitor drought and provide early warning systems was identified as a preventive measure that enables prediction and prevention in the future. Diverging sentiments about the usefulness of delving into the causes of migration and categorizing refugees, instead of just addressing the effects of migration, were also expressed.

Bringing It All Into Focus

Ambassador Robert Ryan, of the INCD Secretariat, started the session by giving an overview of the INCD process, which has produced a draft negotiating text of the Desertification Convention. As each region has unique characteristics, the global convention is a framework for

regional annexes that will set out action programmes at different levels. The INCD has agreed to start implementing the convention as soon as it is signed, in June 1994, rather than wait for the lengthy formal ratification process. Ryan further mentioned that the INCD has commissioned case studies to focus on the gaps and to furnish the INCD with crucial information on what is happening on the ground. The Desertification Convention is to be a legally binding framework, with the conference of parties being a systematic way of follow-up. It is to take an integrated approach, with economic and social considerations taking an important place in the text. Focus will be on participatory action with decisions also made at the local level. There is commitment to a single programme of sustainable development within countries. Although focus is at the community level, action will be taken at all levels to ensure "cascading enabling environments".

Ryan noted that "listening to the people" also means that people should be able to relate to what is happening to them. The emphasis of the Convention is to be on programmes rather than plans of action (unlike the PACD). Countries seeking assistance will have to facilitate action programmes following the model in the annexes of the Convention. These are to include actions taken by NGOs and donor communities. Commitments to long-term programmes will reduce most of the conditionalities of conventional projects. The annexes will also set out coordinating measures for the action programmes. Assistance for scientific and technical cooperation will emphasize indigenous technology, information sharing, and a bottom-up approach.

Ryan told participants that while it is not possible to change the text of the Convention, practical recommendations from this workshop can have an impact on the action programmes

in the annexes. For instance a description of various Participatory Rural Appraisal techniques that can be used on the ground would be an important contribution.

He asked the participants to come up with specific recommendations on: facilitation of local action; national government incentives to help local people; how to deal with inappropriate policies by ensuring international enabling environments and changing attitudes among policy makers and other actors so that the recommendations are implemented; and how to build and improve on the channels of interaction between local communities, taking into account national and global realities.

DISCUSSION: On funding, participants felt that while good action programmes by governments are a necessary prerequisite for funding under the convention, donors should coordinate their actions so that recipient countries are not overburdened with the formulation and monitoring of multiple programmes. This would be facilitated by a long-term approach to desertification, stressing innovative solutions. Addressing the question of whether there would be adequate funds for the implementation of the convention, Ryan said that unlike other conventions, funding would not be centralized under one fund such as the GEF, but instead, a package approach to financing, using all available sources, would be used. For instance the possibility of adding a desertification "window" to existing funds such as the ADB, would be explored.

On popular participation, Ryan said the INCD is sincere in its rhetoric but requires assistance on how to incorporate a true bottom-up approach. In response to a question on whether

the convention would address the macro-economic framework, Ryan said it is not within the mandate of the INCD to discuss trade issues.

APPENDIX: WORKSHOP RECOMMENDATIONS

Desertification and environmental degradation are complex processes brought about by a varied mix of interactions between political, social, economic as well as natural factors at global, regional, international, national, and local levels. The outcome of these processes are highly varied and location specific. It is therefore impossible to devise general prescriptions to these highly complex problems.

Mounting evidence suggests that the introduction of development intervention itself has, at times, been a contributing factor in the various processes leading to desertification. Some of the major causes for these are: increasing pressures on land at the local level, the introduction of inappropriate development interventions such as top down planning and implementation, inappropriate technology (for example large dams) and an overly optimistic drive of planners to enforce sedentarization of pastoralists, the impacts of insecurity in land tenure, the local effects of structural adjustment programmes, and armed conflicts. Peace is an essential prerequisite for development, not only for the stability of government, but also to avoid wasteful

expenditure on war which puts additional pressure on natural resources. Population pressure, large scale migration, and increasingly frequent droughts are also important factors. The widely acknowledged link between poverty and environmental degradation suggests that a fundamental element in good environmental management is the alleviation of poverty.

We affirm that any meaningful strategy to address these problems will have to result in fundamental changes in power relations between the various actors at international, national and local levels. Especially the most directly affected groups of people in drought prone areas themselves will have to be given channels to express themselves and negotiate with representatives of other groups and governments whose interests and activities are having impacts on their livelihoods in the areas affected by desertification in order to compromise between their and these other actors' interests at international and national levels. Nothing short of radical changes will lead to effective solutions and lasting results.

A massive redirection of the development effort away from a top-down directive to a democratic approach responsive to the specificity of local situations and needs is required. This should be an integrated approach that will balance conservation with local survival and social development needs, prioritizing local needs for sustainable livelihoods over national and national interests of various kinds. It must on a large scale promote the self-empowerment of local peoples, so that at all levels they have the right to participate in the decision-making process and express themselves freely and without fear. NGOs that work at grass-roots level and are accountable to the people are appropriate change agents that can be used to make people aware of

their rights and obligations.

From the background of our research and experience we acknowledge that many of the traditional practices, organizations, production-, consumption- and marketing mechanisms, indigenous knowledge and strategies of local peoples for coping with environmental change have been highly sophisticated and adapted to local situations. However, many of these have been lost and broken down due to mounting pressures outside of local people's control. We advocate the preservation and -- wherever possible -- revival of these survival systems as the basis for locally adapted solutions to specific local food security problems and processes leading to desertification in general.

For effective strategies to combat desertification we provide the following recommendations:

A. Donor Agencies and International Bodies.

1. Donors and international bodies should encourage and support efforts towards more effective interaction among all the actors in the development process.
2. There should be a change in emphasis from projects to programmes that are more popularly based, flexible and responsive.

3. International bodies should review their structure and procedures in the light of the principles of this document.

B. Government Policies

1. A prerequisite for any kind of sustainable development policy is a popularly based development strategy.

2. Trade, price, credit, social and economic policies should be evolved with participation by local communities (including indigenous peoples) and other sectors of society.

3. Governments should be encouraged to fully decentralize policy formulation and decision-making and streamline bureaucracy.

4. Government's environment policy should be formulated in coordination with all sectors and institutions concerned.

5. Local communities should be involved in deciding what national and international research and development programmes should be undertaken in their areas, and in the environmental impact assessment procedures.

6. Governments should legitimise the existence of community groups by guaranteeing them

freedom and autonomy in the management of their natural resources and management programmes, and coordinate this process of legitimisation with neighbouring countries to account for trans-boundary pastoral movements.

7. Governments should renew their efforts to eradicate illiteracy in rural areas, and ensure that environmental education is automatically included in the curriculum.

C. Land Tenure

1. The priority reform in regions where customary communal tenure systems are still in existence is for the state to recognise, through legislation, customary land rights, and land tenure relationships.

2. Land reforms aimed at providing equitable access to land by those actually working it and providing them with secure, clear rights (and obligations) associated with their land tenure are essential, although not sufficient, for improving natural resource management.

3. The kinds of land reforms most appropriate for specific countries and situations have to be worked out locally, in consultation with all actors ensuring that women, mobile pastoral groups and other groups at risk are included in the process.

4. The international donor community has a role to play in exerting influence, by establishing

criteria of conditionality where national governments are unwilling to accord local communities appropriate land tenure that promotes good land management.

5. Land clearing should not be a pre-condition of land tenure rights.

6. Land tenure policies should take into account the rights of access to grazing and water customarily exercised by livestock producers, which should be documented and officially recorded.

D. Participation

1. Realizing that there are diverse interests at the local level, marginalised groups should be supported by government and NGOs to organise themselves to represent their interests.

2. Local communities should be involved in information collection and should identify the problems that are most in need of research with a priority oriented towards finding solutions to natural resource management and food production problems.

3. Culturally appropriate participatory methods should be used at all stages of the development process to ensure that interaction between local people and development agencies is ongoing.

4. Local communities should be kept informed by their government about all projects, policies

and programmes that will affect them.

5. Although participatory methods are recommended, care has to be taken that a full commitment is made to genuine participation by all sectors of the community.

6. Technological solutions derived from participatory research should be in line with the socio-economic, ecological and political contexts and management systems of the local communities concerned. Any such technologies must be economically sustainable and environmentally non-threatening.

E. Indigenous Knowledge Systems

1. A prerequisite to planning any intervention in a local community area is to understand and recognise indigenous knowledge and management institutions and structures. Opportunities should be provided for development workers in collaboration with local communities to learn methodologies for identifying and documenting indigenous knowledge.

2. An analysis and understanding must also be achieved of indigenous conceptions of existing systems of production, consumption and marketing. These conceptions often include socio-cultural factors ignored or not noted by outside agents of the development process.

3. A community's perceptions and beliefs relating to the multiple processes that lead to en-

vironmental degradation need to be understood in order to plan effectively to alter any negative factors. Emerging out of indigenous and experts' knowledge regarding the problems and solutions, proper management techniques should be developed which protect biodiversity in different ecological zones.

4. IK studies need to be carried out by competent local people.

5. International agencies, governments, NGOs and local communities should carry out inventories of economic and natural resources based on IK of males and females of all ages and on scientific research. This information should be compiled in a data base, to be accessible and widely disseminated at all levels. Efforts should be made to make this information available in local languages as much as possible.

6. The resultant IK information should be incorporated in any formulation and implementation of programmes and project activities.

7. Incentives should be provided for farmers and pastoralists to conduct informal experiments: the formation of informal organisations of farmers and pastoralists should also be encouraged.

F. Biodiversity, Conservation and Sustainable Development

1. Special efforts need to be made to protect and enhance genetic diversity in wild plants and

animals, livestock and domestic crops. It should be recognised that indigenous peoples' subsistence systems are often repositories of unique genetic variability found in domestic plants and animals.

2. It is recommended that technological diversity be promoted in order to deal with the biodiversity found in cultivars and plants found in the natural vegetation, and also local variability in soils and soil moisture conditions.

3. Development agents aiming to control land degradation in drylands should accept technological diversity as a strategic aim, recognise and support indigenous adaptive technological development, as well as searching for new or improved technologies.

4. The international community and governments should support efforts by local communities to develop environmentally sustainable marketing systems of renewable natural products from threatened dryland ecosystems to counter the prevalent exploitative activities that tend to degrade natural ecosystems.

5. Intellectual property rights relating to indigenous knowledge and technologies should be protected through the application of the relevant sections of the Biodiversity Convention.

G. Gender Issues

Equitable access to resources is a key element in the promotion of sustainable development. Despite this, the situation of many women in dryland areas is deteriorating, as their rights and access to productive resources is undermined and demands on their labour increase. Women have demonstrated considerable resourcefulness in adapting to the largely detrimental impact of these social, economic and environmental changes that are taking place in dryland areas.

1. Any strategy to improve and safeguard the local environment should build on the knowledge and resourcefulness of local women, and address their specific needs.
2. Governments should legislate to ensure that women have equal ownership rights when common property resources are privatised.
3. It should also be recognised that development thinking and practice are usually gender-biased and discriminate against women. Women should be enabled to participate fully throughout the planning process, and to set their own priorities. In addition, women should be recruited into extension and project management at all levels.
4. Gender-sensitive training should be provided to male and female staff at all levels.
5. Mechanisms for promoting women's equal participation in the decision-making process at all

levels should be supported by strengthening existing women's groups and organisations, or where the need is expressed to assist with their formation.

6. Where women themselves identify the need, time spent on domestic labour should be reduced.

7. Women's productivity and independent income-generating capacity should be enhanced by supporting both traditional and alternative income-generating activities.

8. Efforts should be made to ensure that women retain control of their earnings by providing savings facilities specifically for women.

H. Environmental Refugees

1. States are urged to pay particular attention to the increasing stream of internal and cross-boundary displaced people for environmental reasons.

2. States are also urged to focus on mitigating the driving forces behind such displacements and to recognize coerced cross-border movements caused by environmental disruption or long-term degradation as a severe human problem.

3. Regional arrangements should be developed for protection of and assistance to such displaced people.

4. Affected countries should recognize that (a) risk of primary production failure is a distinctive part of dryland environments and that (b) drought and land degradation, although sub-national in extent (in some countries) as a matter of international concern, justify an internal response, in particular to minimize population movements ('environmental refugees') between countries.

5. Countries in a position to provide assistance should recognize that the mitigation of unpredictable food crises in dryland areas of affected countries is a legitimate form of desertification control, as it (1) protects household capital for land-improving investments, and (2) minimizes disruptive population movements;

6. Affected countries' governments should aim to support and enhance the adaptive capabilities of smallholder production systems in drylands (e.g. crop diversification or rotation, indigenous trees and irrigation technologies in farming systems), and to minimize the disruptive effects of new technologies and systems on the capabilities.

I. Communications and Interaction

1. New social relationships and channels of communication need to be developed to facilitate not only participation by local communities in the development process, but interaction between local communities, NGOs, governments and donor agencies.

2. All actors involved in dryland and natural resource management should be equal partners,

each with something to contribute and something to gain from successful interventions.

Recommendations for Follow-up Action

1. UNEP should consider establishing a small working group made up of social scientists and NGO representatives to advise on follow-up action that will be oriented towards implementing recommendations made at this workshop.

2. UNEP should consider initiating and coordinating a series of pilot projects and activities that would incorporate and demonstrate implementation of the various recommendations. These projects and activities should involve as much as possible participatory methods of problem identification, planning and implementation and aim to improve current methods of communication and interaction between local communities, NGOs, national governments and donor/technical assistance agencies.

3. If the above recommended follow-up steps are taken, UNEP should seek government, NGO and other international donor partners with whom to carry out the actions in partnership.

4. It should be recognised that the project formulation and planning phase is as important as the implementation of the activities. To carry out fully many of the recommendations contained in paragraphs A through I above a great deal of time may have to be spent in participatory approaches and the gathering of community-based information, including indigenous knowledge.

5. Given a recognition that many government and donor agency personnel are not familiar with the socio-cultural factors affecting natural resource management and dryland degradation, it is recommended that appropriate NGOs and social scientists be encouraged to develop sensitisation and training programmes oriented towards improving socio-cultural understanding amongst personnel involved in the development process. Governments and donor agencies are encouraged to support these efforts and eventually make them part of standard requirements and procedures within their respective organisations.

6. More attention must be devoted to research on socio-economic aspects of dryland management: researchers and knowledgeable NGOs should make a concerted effort to de-mystify myths concerning pastoral and forager societies and economies through publications, workshops and interactions with development agents.

7. UNEP should encourage the development and dissemination of new and existing methodologies of participation and interaction.



UNITED NATIONS ENVIRONMENT PROGRAMME
PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT
DESERTIFICATION CONTROL PROGRAMME ACTIVITY CENTRE



PROGRAMME OF WORKSHOP ON
"LISTENING TO THE PEOPLE:
SOCIAL ASPECTS OF DRYLAND MANAGEMENT"

UNEP Nairobi
14 - 18 December 1993

Tuesday 14 December

PLENARY

Chair: Mr. W. Franklin G. Cardy ,
UNEP Deputy Assistant Executive Director
and Director, DC/PAC

9.00 Welcoming address - Ms. Elizabeth Dowdeswell,
UNEP Executive Director

Opening address - Mr. Ruben Mugo
National Environment
Secretariate
Ministry of Environment and
Natural Resources, Kenya

Issues and Objectives of the Workshop

- Mr. W. Franklin G. Cardy

Overview of Social Aspects of Dryland Management

- Mr. Solon Barraclough, UNRISD

10.30 Tea break

WORKING GROUPS: SESSIONS I.A. and I.B.**Session I.A.: TRADITIONAL AND WESTERN NATURAL
RESOURCE MANAGEMENT TECHNIQUES**

Chair: Dr. Ron Ayling

- | | | |
|-------|---------------------------------------|------------------|
| 10.45 | 1. Experience gained | - Yvette Evers |
| 11.30 | 2. Use of indigenous knowledge | - Sabine Häusler |
| 12.15 | 3. Researchers and rural communities- | Ron Ayling |

**Session I.B.: BEYOND FARMER FIRST: PARTICIPATORY
APPROACHES TO RESEARCH AND PROJECT
PLANNING AND MANAGEMENT**

Chair: Prof. Jöran Fries

- | | | |
|-------|---|-----------------------|
| 10.45 | 1. Camel pastoralism in Rajasthan | - I. Köhler-Rollefson |
| 11.15 | 2. Dryland farming systems and sustainable resource
management in Africa | - M. Mortimore |
| 12.00 | 3. Village Land Management in Burkina Faso | - Armelle Faure |
| 13.00 | Lunch | |
| 14.00 | Preparation of Working Group recommendations to
Plenary | |

PLENARY

Chair: Dr. Till Darnhofer

- | | | |
|-------|---|------------------|
| 15.00 | Indigenous Knowledge Systems | - B. Rajasekaran |
| 15.30 | Report on "Human Livelihoods in the Drylands"
workshop | - Jöran Fries |
| 16.00 | Tea break | |
| 16.15 | Report of Working Group Session I.A. | |
| 16.45 | Report of Working Group Session I.B. | |
| 17.15 | Discussion | |
| 18.15 | Closure | |
| 18.30 | Reception | |

Wednesday 15 December**WORKING GROUPS: SESSIONS II.A. and II.B.****Session II.A.: LAND TENURE AND COMMON PROPERTY
RESOURCES ISSUES**

Chair: Mr. Ablasse Ouedraogo

- 9.00 1. Participatory planning and research for
better land-use management - Bara Guèye
- 9.30 2. Natural resource management in Africa
- Roy Behnke
- 10.00 3. Pastoral land rights in Sudan
- Ali Jamma'a
- 10.30 Tea break
- 10.45 4. Environmental degradation and government policy
in Latin America - Jorge Uquillas
- 11.15 5. Indigenous peoples - Robert Hitchcock
- 12.00 Preparation of recommendations to Plenary

Session II.B.: GENDER ISSUES IN DRYLAND MANAGEMENT

Chair: N.D. Jayal

- 9.00 1. Equity and access to resources
- C. Kinuthia
- 9.30 2. Gender and participation - Michael Horowitz
and F. Jowkar
- 10.00 3. Management of resources - Wanjiku Mwagiru
- 10.30 Tea break
- 10.45 4. Change in rural Middle Eastern women
- Farouz Jowkar
- 11.15 5. Women in pastoral societies in Africa
- Judy Pointing
- 11.45 6. Maasai women looking at themselves
- Birgit Duden
- 12.15 Preparation of recommendations to Plenary
- 13.00 Lunch
- 14.00 Preparation of recommendations to Plenary

PLENARY

Chair: W. Franklin G. Cardy

- 15.00 1. Report of Working Group Session II.A.
- 15.30 Tea Break
- 15.45 2. Report of Working Group Session II.B.

- 16.15 Discussion
- 16.45 3. Relating Socio-economic Concerns to the
Desertification Convention - Dr. Bara Guèye
- 17.15 Discussion
- 18.30 Closure

Thursday 16 December

PLENARY: SESSIONS III AND IV

Session III: FOCUS ON DONORS

Chair: Mr. David J. Whaley, UNDP

- 9.00 Panel discussion with:

World Bank
UNSO
USAID
SIDA
FAO
IDRC
UNEP

- 10.30 Tea Break

- 10.45 Continuation of panel discussion

- 13.00 Lunch

Session IV: FOCUS ON GOVERNMENTS

Chair: Dr. Bara Guèye

- 15.00 1. Mexico
- 15.15 2. Botswana
- 15.30 3. Mali
- 15.45 4. Syria
- 16.15 Tea break
- 16.30 5. India
- 16.45 6. Thailand
- 17.00 Discussion
- 18.30 Closure

Friday 17 December**PLENARY**

Chair: Dr. Andrew Warren

9.00 Environmental refugees and migration
- M. Trolldalen

10.00 Tea Break

10.15 **PLENARY: BRINGING IT ALL INTO FOCUS**

Chair: Ambassador Robert Ryan

10.45 Discussion

13.00 Lunch

14.00 **PLENARY**Session V.: **FINAL RECOMMENDATIONS**

Chair: Ambassador Robert Ryan

15.30 Tea break

PLENARY

Chair: Mr. Nay Htun

15.45 Report of Workshop Recommendations

16.45 Adoption of Recommendations and Follow-up

18.00 Formal Closure

18.15 Conference Room 2

Ndere Troupe performance of "Rugaaju The Bull":
Demonstration of the delivery of environmental
messages through traditional dance and theater.Saturday 18 December**Field trip to Elangata Wuas Ecosystem Management Programme**8.00 Buses leaving from Panafric Hotel and UNEP parking
lot behind Q-block.

The field trip will consist of a visit to the Elangata Wuas Ecosystem Management Programme basecamp and an explanation of various project activities: ostrich farming, a tree nursery and a demonstration of creating women's awareness through self-photography. Maasai women will be there to show how the photography activities work, and they will be displaying their bead-work handicrafts. A traditional Maasai meal of *nyama choma* (roast goat meat) and the trimmings will be offered free of charge. There will be transport available for those who wish to leave earlier than the scheduled 3 P.M.



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"LISTENING TO THE PEOPLE: SOCIAL ASPECTS OF DRYLAND MANAGEMENT"
UNEP Nairobi 14 - 18 December 1993

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ACRONYMS

CIKARD	Centre for Indigenous Knowledge for Agriculture and Rural Development
DC/PAC	Desertification Control Programme Activity Centre
ELCI	Environmental Liaison Centre International
ENDA	Environment et Developpement du Tiers Monde
EPOS	Environmental Policy and Society
FAO	Food and Agriculture Organization (U.N.)
FoE	Friends of the Earth

IBPGR	International Board for Plant Genetic Resources
IDA	Institute for Development Anthropology
IDR	Institute of Desert Research
IDRC	International Development Research Centre
IDS	Institute of Development Studies
IFAD	International Fund for Agricultural Development (U.N.)
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
INCD	Intergovernmental Negotiating Committee for a Convention to Combat Desertification
INTACH	Indian National Trust for Art and Cultural Heritage
ISS	Institute of Social Studies
ITDG	Intermediate Technology Development Group
KENGO	Kenya Energy and Environment Organizations
KUNA	Asociación Kunas Unidos por Napguana
LPP	League for Pastoral Peoples
ODI	Overseas Development Institute
RDF	Rural Development Foundation
SIDA	Swedish International Development Agency
UNDP	United Nations Development Programme
UNRISD	United Nations Research Institute for Social Development
UNSO	United Nations Sudano-Sahelian Office
USAID	United States International Development Agency
WFED	World Foundation for Environment and Development