COOPERATIVE AGREEMENT ON HUMAN SETTLEMENTS AND NATURAL RESOURCE SYSTEMS ANALYSIS

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LOCAL INSTITUTIONS, TENURE, AND RESOURCE MANAGEMENT IN EAST AFRICA

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INTRODUCTION

Considerable attention has been given recently to the role of local institutions and communities in the management of Africa's natural resources (Doughlin, Doan, and Uphoff 1984; Odell 1982; Sandford 1983). Much of the research has focused on the part that tenure rules play in resource use and conservation, and has resulted in a highly charged debate dividing, on the one hand, advocates of private property and radically new forms of resource management and, on the other hand, supporters of indigenous tenure systems (often based on some form of collective allocation) and institutions. The empirical evidence to support either side has been flimsy at best, and ahistorical in most cases. Thus, for example, what is proffered as "proof" of institutional inefficiencies among East African herders--for instance, "overgrazing"--is more often a result of historical circumstances that limited pastoralists' land base, than it is of land mismanagement (Little 1984).

Here, we examine the role of local institutions and communities in the management of rangelands and forests in East Africa, which until recently were managed on a common property basis, often either neighborhood or clan-based.[2] Particular attention is given to those variables that are likely to make local resource management systems ineffective. As will be shown, change in tenure patterns is only one of many factors that have

implications for natural resource use, and that in specific cases it becomes difficult to disaggregate the causal effects of tenure from other, perhaps even more significant variables. These include: changes in the level of decision-making; wealth differentiation (and the related factor of poverty); commercial market linkages; and demographic pressure.[3] Case materials drawn from the authors' research in Kenya are presented within a historical framework, particular attention being given to the continuities and discontinuities in resource management policy from the colonial to post-colonial eras. While "yet another" presentation of case study materials will not resolve theoretical issues, it can help clarify the relationship between ecology and changes in tenure and management practices.

The paper consists of four parts: (1) the elaboration of a conceptual framework; (2) a case study on range management; (3) a case study on forest management; and (4) a discussion summary. In each of the case studies, a similar set of issues are addressed. Where appropriate, materials from elsewhere in east and southern Africa are presented.

A CONCEPTUAL FRAMEWORK

Most communities in east Africa had mechanisms--either formal or informal--for managing such critical natural resources as range and forests (Brokensha, Riley and Castro 1983; Little 1984; Sandford 1983), although conservation of resources may not have been the primary goal. However, changes have occurred, both in the colonial and independence eras, that make it difficult to test hypotheses about the effectiveness of these indigenous institutions and practices. The question is not whether or not

such practices and institutions ever existed, rather it is the degree to which they have adjusted or not adjusted to changing parameters. In this section, we discuss the elements of a framework for examining natural resource use. Here we are not concerned with the general characteristics of common property systems (see Ciriacy-Wantrup and Bishop 1975; Oakerson 1984), but only in those factors that, when changed are likely to affect the nature of local resource management.

Levels of Decision-Making

Shifts in the locus of resource-related decision-making has considerable implications for local resource use. In the Sudan, for example, the state took control of range regulation from local authorities in the late 1960s (Haaland 1980), while in Botswana local grazing and water management systems have been supplanted by District Land Boards, which currently regulate access to these resources (Gulbrandsen 1980). The general pattern is for the transfer of decision-making from local communities to state-controlled institutions and organizations; even though vestiges of the indigenous management system may survive, they seldom have critical significance. Yet the usurption of decision-making power by governments has been incomplete in most African states, creating for farmers and herders what Runge calls a problem of "assurance". In this situation producers lack confidence in the capacity of either state or local institutions to regulate resource use, creating considerable ambiguities over who has legal access to range, water and forests.

Wealth Distribution

Economic differentiation is severe in many rural communities of East Africa. Where wealth distribution is especially polarized and poverty widespread, many impoverished families find it difficult to mobilize labor and other inputs for conservation purposes. Those areas that are characterized by impoverishement, where people may be landless and/or stockless, are likely to experience environmental problems, since short-term cash needs will outweigh conservation investments among the poor. Charcoal burners and forest squatters are examples of impoverished groups whose actions cause environmental degradation. As will be shown later in the paper, different classes of producers have different production strategies and uses for the environment, which make problematic collective efforts at resource management. The ecological problems often associated with poverty can be found both in areas where production is organized on private lands and where it is practiced on common lands.

Market Linkages

The emergence of market value for range and forest products is likely to change local resource use . First, increased commercialization attracts outside entrepreneurs who are likely to have a different set of interests and, in general, may be less concerned with resource conservation than the local community. Second, these individuals are often from groups with powerful linkages to the state and may, in some cases, be supported by state enforced legislation. Thus, even where local regulations on natural resources exist, these outsiders are able

to operate outside of indigenous controls and, when necessary they can evoke their ties to more powerful groups. Finally, where the market value of the resource increases there are likely to be pressures from both outside interests and local elites for the privatization of lands and other resources.

Demographic Pressure

The demise of community-based resource management systems is often linked to population growth. As demographic pressure (and associated land shortage) increases, it is argued, pressures toward privatization accelerate. While this is generally true, it is difficult to separate population from those other variables indicated above, such as market linkages and state encroachment. Especially, the resource degradation associated with overpopulation may be a result of the loss and/or privatization of lands around communal areas. A good example of this in Kenya's colonial period was the European farm settlement surrounding the south Tugen communal lands in Baringo District, which monopolized critical dry season grazing and water sources. The alienation of these lands created the stock/ human crowding problems in the south of the District (Anderson 1982).

Population pressure is a factor that makes common property management vulnerable. The resource shortages associated with high population densities create competition and tensions that local institutions and mechanisms may not be able to resolve. Where population pressure is especially great, the deferrment of communal dry season grazing, for example, may be problematic. Pressures toward privatization of trees will also increase.

The characteristics indicated above provide a framework for examining local resource management in the context of social change. Simplistic causal statements about the breakdown in local resource management and associated ecological problems are inappropriate. In this respect, to isolate land tenure as the critical variable, and to ignore other factors such as social differentiation and labor availability, is equally misleading.

INDIGENOUS SYSTEMS OF RANGE MANAGEMENT

Understandings of indigenous systems of range management remain rudimentary, although such knowledge is crucial to the design of effective range management programs. The number of unsuccessful attempts at intervening in pastoral management systems is well documented both for the colonial (Sobania 1979) and post-colonial periods (Migot-Adholla and Little 1981). The African Land Development (ALDEV) Schemes in Kenya (1946-62) are an excellent example of grazing programs that were imposed without any prior knowledge of the local management system, or without consulting the local people. As Fumagalli (1978:57) notes for the Leroghi Grazing Scheme of the ALDEV period, "the Samburu elders were never consulted, never given active voice, and all their remonstrations, protests and complaints were systematically ignored". Like the forestry and soil conservation programs of the colonial period, policies toward the range were concerned with the protection and conservation of the natural resource, not with the development of the resource users.

While there have been several excellent field studies of pastoral systems of East Africa, few have systematically examined the organization of grazing and the tenure systems that affect

it. Critical details of rules determining access to grazing and water, as well as of institutions for regulation, are lacking. Nor is micro-level data readily available on how these grazing regulations relate to the "where" and "when" of pastoral livestock movements; that is, the areas livestock move to and the months when such movements occur. The examples used in this section are drawn from the Maa-speaking areas of east Africa, particularly the Maasai and the Il Chamus (Njemps) areas of Kenya. The Il Chamus material was collected by one of the authors (Little) in 1980-81 and 1984, while the Maasai examples are based on the reports of De Souza (1983;1984), Pasha (1982), and Peacock et al. (1982).

The Historical Context

Colonial policies drastically affected the territorial boundaries of the Maa-speaking peoples. Prime range and agricultural lands of Uasin Gishu, Laikipia, and other Maasai areas of the Rift Valley were alienated for European settlement. Early colonial administrators sought to pacify the pastoral regions and, in some cases, they directly intervened in the resource management system to achieve this. For example, the Provincial Commissioner of the Northern Frontier District was given powers to define grazing and water boundaries for the different ethnic groups in an attempt to avoid armed conflict and raids on livestock (Migot-Adholla and Little 1981).

One of the earliest attempts to deal with "perceived" problems of resource management (i.e., as perceived by colonial authorities) was through compulsory destocking. Beginning in the

1930s several destocking programs were initiated--including among the Il Chamus--in an attempt to reduce grazing pressure. Most were abandoned because of the negative, and sometimes violent, response on the part of local herders.

In the 1940s and 1950s the colonial perception of the range problem shifted from that of overpopulation to land mismanagement. Under the ALDEV program (1946-62) efforts were made to rehabilitate the severely degraded areas, such as Baringo, and to introduce--and often forcefully implement--new resource management techniques (e.g., rotational grazing). While the ALDEV program generated useful information on technical approaches to semi-arid/arid land use problems, it further alienated pastoralists from the state because of its style of intervention.

With independence and the ensuing political dominance of agriculturalists, cultivating groups were given greater freedom of movement. They often settled in dry season grazing areas, such as around Ngong and Loitokitok in Kajaido District, and in the Mau escarpment of Narok District. Without access to traditional highland and swamp grazing areas, pastoral groups must concentrate their animals on already depleted lowland ranges. This often results in severe livestock losses during droughts.

The Maasai Management System

While historical factors make problematic any discussion of "traditional" management systems among the Maasai, there is evidence that in some areas these systems have existed relatively intact until recently. The Maasai of Kajiado District have

several different strategies for managing range resources. Jacobs (1980:287) indicates some of these as such: "elaborate grazing sequences (including irregular rotation as well as simple alteration) based on systematic reconnaisaince of, and movement to, grazing flushes in order to create standing hay in the dry-season reserves; regular use of donkeys to carry water for immature livestock and human consumption, both to expand the grazing area and to permit camps to stay away from their dry season reserves as long as possible; detailed knowledge about the nutritional value to livestock of a wide range of grasses, herbs, and seeds, and use of these at the appropriate stage of their growth...and regular social rebuke and avoidance of families or camps that fail to adhere to good management practices in their locality." In addition to these practices, the Maasai have a system of reserved grazing with an elaborate local terminology to describe it. For example, in the Meruishi area of Kajaido District, there are 13 reserved grazing areas (called olopololi) of which two are managed by single producers, while the others are managed by more than one herdowner (de Souza and de Leeuw 1984). The olopololi is located near a homestead (or collection of homesteads) and was traditionally reserved for calf grazing. These areas can range between 100-800 hectares, and in the case of Meruishi they account for approximately 20% of available range. During the dry season, producers must seek permission from the homestead heads associated with a particular reserved area before they can move animals across it.

In recent times, adult cattle and small stock have begun to

utilize the olopololi, which, as noted above, were traditionally reserved for calves. Within the olopololi, the grazing is sub-divided and certain stock species are restricted to grazing only on certain parts of the olopololi. For example, kids, lambs and young suckling calves are kept in one sub-section of the olopololi; while adult cattle, mature small stock, and non-suckling calves each have their own areas. It is noted that "according to Maasai informants the basic objective in the management of reserved grazing areas is that grazing resources are used in a manner to ensure conservation and annual regeneration" (de Souza and de Leeuw 1984:9).

There also are neighborhood-based controls on grazing. Residential neighborhoods have associated with them two types of dry season reserves: dokoya unkishu (to be used in early to mid dry season) and enkaroni (to be used in late dry season as a final reserve). As Peacock et al. point out, "collective action may be taken against any person herding prematurely in the reserved area, whether they are from the controlling neighborhood or from elsewhere (1982:4)". Elders decide upon the date of opening for each of these reserves, and they also insure that permanent settlements are not allowed in these areas.

Several factors have changed both the practice of olopololi and the reserved dry season grazing system. With the adjudication of group ranches in Kajaido District, the responsibility for resource control has moved from the homestead and neighborhood to the ranching committees. "It is unclear to both group ranch committee members and non-members, what role, if any, the recently formed group ranch committee has either in the

old system, or in creating a new system of grazing resource control" (Peacock et al. 1982:29). The ambiguity has allowed some individuals to carve off large areas of the range, by establishing olopololi and then using this as the basis for claims to land ownership. The "owners" of some of these areas are leasing pasture rights to neighboring individual ranchers to allow them to fatten steers (De Souza 1984:14-15). In the Poka area of Kajaido District, this practice is most widespread, and in this area individual claims to olopololi are to be used as a basis for sub-division on an individual ownership basis (Pasha 1983:8).

The practice of reserving areas for dry season use is also complicated by the initiation of group ranches and the development of water sources. In the Mbirikani area several permanent homesteads, including one with a wooden stockade yard, were constructed in reserved areas (Peacock et al. 1982:29). There are recent indications, however, that at least certain members of the Mbirikani ranching committee are concerned about the lack of grazing control. Residential areas and dry season grazing areas are being demarcated, and those homesteads residing in grazing zones are being told to move. While this proposal has been initiated by a minority of committee members, it has been endorsed by the committee chairman and actions taken to regulate settlements and the use of dry season grazing. In some cases, "temporarily unoccupied bomas sited outside the residential areas were burned, and one resident who refused to move was arrested by police" (Peacock et al. 1982:31). It is still unclear whether

this solution will be acceptable to the majority of members, and whether or not it will effectively replace the earlier system. What is apparent, however, is that privatization, the increased value of range lands and the introduction of ranching committees has affected local conservation techniques.

The Il Chamus Management System

The management of common grazing resources is less complex among the Il Chamus, who control a much smaller area and are not as rich in livestock as the Maasai. Because of the limited mobility of the Il Chamus, and the dry season use of predominantly two grazing resources--the swamps and the hills at the base of the Laikipia escarpment--regulation is facilitated. Grazing controls (called olekeri) were predominantly on a neighborhood basis, with each neighborhood, or a coalition of two to three neighborhoods, having a coucil of elders (lamaal) to enforce them. Members of the il murran generation (18-30 years) were responsible for enforcing grazing restrictions. They looked after the swamps in the wet season to ensure that stock did not trespass, and during the dry season kept non-neighborhood (except where local permission had been granted), as well as non-Il Chamus animals out of the area. Individuals who violated the regulations were fined a small number of small stock.

Reasons for the breakdown of the olekeri system are several. They include:

(a) the decline in the political power of elders vis a vis the government chiefs in the area, which results in the usurption of local decision making power.

(b) increased inequalities in the past 15 years that make it

difficult to reach collective decisions, as well as to discourage non-pastoral production strategies by the poor, including the cultivation of rainfed farms in range areas;

(c) the involvement of il murran in non-pastoral activities, such as wage employment, agriculture and formal education, which means that many are no longer residing in their home neighborhoods, or if so they are engaged in activities other than pastoralism; and

(d) the loss of dry season areas in the hills to outside agropastoralists, which forces the Il Chamus to crowd their animals on available grazing resources and makes it difficult to reserve pastures.

The changes indicated above make the area prone to resource mismanagement and to outside exploitation by non-Il Chamus. Without grazing restrictions, which new leaders have not been willing to reinstate, traders, townsmen (residing in Marigat), and ranchers residing nearby are able to graze their animals in certain areas, often with the support of local elites (Little 1985). They are able to take advantage of the wealth differentiation by hiring stockless Il Chamus to herd their stock. The principle of exclusion, an important characteristic of common property systems, is blurred since it has become unclear as to who has legal access to the range.

The contemporary grazing system in Il Chamus is not without controls. It is still managed on a communal basis, and has not yet reached the level of an open access or "free for all" system.

Those herding families who reside in the area and who depend heavily on pastoral production for their livelihood are aware of the current problems. Most would like to see a form of grazing regulation reinstated, but under the control of the local communities, not the state. They are also aware of the current ambiguity over land ownership, which has allowed outside groups (particularly neighboring agropastoralists) to encroach. The receptiveness among herders to the introduction of group ranches is related to the uncertainty over territorial claims caused by encroachment. Because the group ranch provides legal recognition of land, the Il Chamus favor them as a means of establishing formal boundaries, thus reintroducing the notion of exclusiveness (cf. Galaty 1980).

INDIGENOUS MANAGEMENT OF FOREST RESOURCES

The Historical Context

The Mbeere, who occupy a savanna area east of Mount Kenya, reaching down to the Tana River, had developed an extensive knowledge of the local woody vegetation, which supplied many products--including fruits, material for housing, fodder, fuelwood, medicines, and fibres. Similar to the pastoral groups mentioned above, the implementation of colonial policies affected their resource management system. Beginning in the 1920s, several natural resource regulations were introduced, which forced the Mbeere to follow certain new resource practices and forbade them to practice others. To give an idea of the scope of the new regulations (which were nearly all passed by the Embu Native Local Council) here is a summary of the new rules, most of which relate to agriculture rather than forestry:

Do	Do Not
Build soil conservation terraces;	Cultivate on hillsides and
Plant famine reserve crops	near streams;
(cassava, sweet potatoes);	Burn grass (except by permit);
Plant trees;	Cut down certain species of
Set aside forest reserves;	trees, or trees less than a
	specified size;

Not all regulations were consistently enforced, and most were very unpopular, being regarded as unwarranted intrusions into what had been seen as a satisfactory local system of natural resource management. In some cases, it is clear that this was not true; for example, Colin Maher's report on soil erosion in Embu District (1938) convincingly argues that soil erosion was widespread and threatening, and he confirms his findings with graphic photographic evidence of the deterioration. There is no doubt that (a) soil erosion was a major problem, especially in Eurore Location, and (b) some immediate measures were essential to prevent further loss of soil in this already marginal area. What was controversial, however, was the series of measures that were proposed--and introduced. The compulsory building of terraces was especially disliked, and elderly men told many stories of bullying or corrupt agricultural instructors who enforced the new regulations in arbitrary ways.

In the case of forest reserves, three were established in Mbeere in the late 1930s and early 1940s, and despite local protests, the people were excluded from the reserves. This was elsewhere a cause of much resentment: the Kikuyu, for example,

complained bitterly about not being allowed into Mount Kenya Forest, not even to collect honey or medicines. Later, permits were sold for specific purposes, enabling local people to enter the forest to collect fallwood for fuel, or other minor forest products. Because the Mbeere reserves were relatively small areas, only a few were affected, notably those who were accustomed to collecting honey, gathering medicinal plants, or hunting in the forests. These people were now excluded from the reserves.

During the colonial period, African forestry departments, reflecting western notions of conservation and resource management, shared some common aims and values. Among the hallmarks of African forestry departments were the following:

(a) There was an emphasis on commercial forestry, on growing timber that could be sold either within the country (primarily for mines and industries) or for export.

(b) There was a corresponding emphasis on exotic species, conifers and eucalyptus spp. being among the most popular.

(c) Conversely, there was little interest in indigenous species, which were for the most part completely ignored.

(d) There was also little enthusiasm for the impressive ethnobotany of local peoples, which was beginning to be documented in the colonial era. Instead, local people were usually regarded as ignorant about forestry and conservation and, in fact, as spoilers of the environment.

(e) Most forestry officials were dedicated to setting aside certain proportions (e.g., six percent) of the total land

area for forest reserves, which usually included both national and local reserves.

(f) Foresters were regarded by local people as a sort of auxiliary police, since one of their main functions was to keep people out of reserves, and to prosecute them for infringement of regulations.

Apart from the establishment of forest reserves, few other interferences were made in the land use system of the Mbeere, whose semi-arid lands had no attraction for European farmers. Right at the end of the colonial period plans were started to develop Meka sisal estate, with several thousand hectares being set aside in a sparcely populated area of Mavuria Location. The estate was actually started in 1964, just after independence, and by the time of first production world prices for sisal had fallen drastically, so the estate was never commercially successful.

Several features are familiar in colonial management of natural resources. These include: the emphasis on markets; the neglect of subsistence and domestic products; the contemptuous dismissal of indigenous knowledge; and the policing function of the forestry personnel. Similar to the pastoral programs of the colonial period, there was virtually no understanding of the local management system nor any attempt to seek local involvement.

The Management System

Throughout the colonial period it was officially assumed that land in "the native reserves" was under communal control. But in Mbeere, as happened elsewhere in Kenya, some

individuals had acquired individual holdings. These were not registered with the government until much later, but were obtained by negotiation with the elders of the muhiriga (lineage). For example, one man who lived near the British-American Tobacco centre, at Ena, was a pioneer in planting trees, starting in 1951. To ensure that he and his sons would not lose the benefit of his foresight, he persuaded the elders to recognise his right to his own land. Most other people had a customary right to cultivate the same land each year, or to make new fields, when necessary, in an area not occupied by another. In those days, conflicts over land were rare, except for the small fertile part of Mbeere nearest to Mount Kenya, which was beginning to attract settlers from the more arid, lowlands at the end of the colonial period.

Because it seemed that there was adequate land for all, and because the population seemed small in relation to land, it was even relatively easy for a stranger (most of whom were Akamba) to acquire rights to cultivate land as a mu-hoi, or tenant. Some tenants went through customary rituals to become lineage members, which supposedly allowed them full rights in land. But when individual titles began to be issued in the 1970s, the claims of many of these strangers were not recognized.

Apart from relatively small areas of land that were cultivated, or grazed regularly, or were near homesteads, land was regarded as weru, or wilderness, where all were free to go, to hunt, collect honey, or thatching-grass, or fuelwood or any of the other forest products on which Mbeere material culture was

based. The "traditional" land tenure system, then, was flexible and vague, in that boundaries between clans were usually not clearly known, as there had not been a need for clarity when land was abundant. This vagueness gave rise to numerous conflicts and bitter litigation, when individual land titles were introduced.

A few trees, especially the large hardwoods and valuable building trees (e.g., mukau, Melia volkensii) were regarded as clan or even individual trees. But with these exceptions, all trees were considered as common property to which all Mbere had access. There is little evidence of any systematic, wide-spread management of the forest resource, which did not appear to be needed in earlier years because scarcities were few. There is also little evidence of deliberate conservation practices, although several inadvertent mechanisms served a conservation purpose. For example, it was usual to leave riverine vegetation undisturbed, which provided good protection for the rivers and streams, and also helped prevent soil erosion. In addition, hillside cultivation was rare, possibly because it was easier to cultivate flat lands, which were readily available in the pre-colonial period. Finally, the Mbeere had many sacred groves, more than 100 being listed by an early colonial official. These were areas ranging from one-fourth to three hectares, where the cutting of any tree was forbidden, and which were used for ritual sacrifice. A few of these groves survived as late as the 1970s, providing excellent sites for examining the vegetation of a century ago, as several species of trees were rare, or not seen at all outside the groves.

There was, until recently, little tree-planting, with the

exception of a few fruit (especially mango), shade and ornamental trees near the homestead: and it was relatively few homesteads who practised even this limited form of tree-planting. Trees were seen as an abundant and accessible resource, but this attitude changed drastically in the last ten years.

Recent Changes

One immediate effect of independence was a weakening of soil conservation measures, which were generally so disliked, and which had been so closely identified with the worst aspects of colonial rule. In Mbere, it was not until the late 1970s that the agricultural extension service again embarked on widespread soil conservation measures, very similar in aims to those used in the colonial period. This time, gentle persuausion rather than compulsion was used, with marked success. Once again, farmers are being discouraged from cultivating on steep slopes, and they are being encouraged and helped to construct terraces, and to plant trees.

There has also been a general encroachment, in many parts of Kenya, into forest reserves, not only by subsistence producers but also by tea growers, and people seeking construction timber and other forest products. Sometimes authorities have found it politically expedient to turn a blind eye to such illegal incursions into forest reserves.

We stated above, in our conceptual framework, that it is difficult to distinguish the important characteristics of common management systems from each other. Although this is true for Mbeere, it is possible to list and comment on the most important

factors.

First is the overriding factor of demographic pressure, especially as comparatively little area is really suitable for rainfed cultivation. This has led to increased competition for the small fertile areas in the northwestern parts. The increase in population cannot be understood except in conjunction with other factors, notably land adjudication. Most of Mbeere has by now been individually registered and most farmers have been given title to land. There are, however, land disputes that have not yet been finally settled.

We summarize the salient points of this major change, full accounts being available elsewhere (see Brokensha and Glazier 1973). Government effectively left land allocation decisions to the clans, which had to:

(a) determine their own boundaries vis a vis other clans, some of which might have land in several discrete units;

(b) decide who was eligible: for example, were women, children, strangers, and urban-based workers (migrants) to be given land? Each clan decided on its own, and for a period of a few years the clan elders possessed more power than they had before or since. There was a widespread suspicion that decisions were influenced by bribes, and the land division has left a legacy of bitterness (Brokensha and Njeru 1977).

At this time, the Embu County Council had the power to reserve some land for common use. It would have been possible even to reserve all the sacred groves as common lands, but such was the pressure by individuals and clans, that no common lands were established. Within the space of a few years, there was a

remarkable transition in land tenure, and all common land disappeared. People complained that it was difficult or even impossible to use another's land for any purpose, unless one had obtained permission or, in some cases, even made a payment. Here is a list, in increasing order of difficulty, of uses made of other people's land: walking across land; collecting medicinal herbs, fallwood and building timber; grazing livestock; placing honey hives; planting crops; and planting trees.

Once land became a marketable commodity, rich outsiders from land-hungry areas, such as Embu Division, bought up large tracts of land in the more fertile areas. Some of them used tractors or irrigation, and there was a rapid growth in inequity. For example, in one sub-location in 1977, 5% of the population owned 24% of total land, while the poorest 53% controlled only 20% of land.

Mention has been made of market links, which were important in relation to charcoal. Until the early 1970s, there had been a small charcoal industry for use by local blacksmiths and by a few people like school teachers and owners of local tea shops, who used it for cooking. Since then, there have been drastic changes, spurred in part by the rural roads that were built under the Special Rural Development Programme. Intended to facilitate the marketing of cotton and other export crops, the roads were a significant factor in the increase of charcoal production. Charcoal became a major cash crop, especially for poor families at times of food shortage, and such times occurred frequently in Mbeere. The charcoal was destined both for the towns and for

export to the Gulf nations. The export trade has been largely stopped, but the urban markets maintain a high demand, despite a stream of bans, price regulations and trader licensing.

One last factor should be noted, that is the loss of land as a result of the construction of dams (Kindaruma, Kamburu, and Gitaaru, and Masinga) along the Tana River. Each dam inundated parts of Mbeere, resulting in a further loss of land, most of which were semi-arid and provided honey and other savanna products.

DISCUSSION

The two case studies illustrate some of the changes in resource management practices in Kenya that have occurred in the present century. These transitions should be seen in the broader context of social and agrarian change, which has increasingly differentiated producers; restricted their access to critical natural resources; created markets for land, trees and range products; strained domestic labor supplies; and weakened local institutions for managing natural resources. While land tenure becomes a variable to examine in resource management, it may prove less significant than these other factors which deal more with process and the actual management practices, than with jural rules. As the Mbeere materials demonstrate, tree management by individuals was taking place prior to legal changes in the land tenure system.

In spite of the recent changes, many remnants of the indigenous management systems still exist in the Maasai, Il Chamus and Mbeere areas; and producers of these regions maintain a sophisticated knowledge of the environment. Similar to

colonial programs, however, many donor-funded natural resource programs fail to build upon, or even to acknowledge, local practices and knowledge. Yet these projects usually require producers to invest their own labor (ano, in some cases, capital) in conservation activities, that may be less viable than existing practices and that may be implemented with no real local participation in decision-making. Given the current political and social context of resource use in east Africa, we are not arguing for a return to indigenous systems of resource management. We do suggest, however, that these systems be examined, and that some of the current paradigms of natural resource use be subjected to more rigorous empirical and analytical tests before radically new forms of management are introduced.

NOTES

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(2) The characterics of common property systems have been subject to considerable review recently. For a current anthropological perspective on the topic, see Peters (1985).

(3) This conceptual framework is derived, in part, from Oakerson's (1984) model of common property management.

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