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LAND TENURE ISSUES IN WEST AFRICAN LIVESTOCK AND RANGE DEVELOPMENT PROJECTS

by
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AN INSTITUTE FOR RESEARCH AND EDUCATION ON SOCIAL STRUCTURE, RURAL INSTITUTIONS, RESOURCE USE AND DEVELOPMENT

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* This paper is a summary of the West African material to be condensed and revised as part of a much larger work undertaken jointly with John Bennett and Steve Lawry. Most of the ideas expressed are the result of this very stimulating partnership. Aidan Southall, Kusum Nair, Tom Lengyel, William Weber, and Maryam Niamir all generously took the time to comment on an earlier draft. Any errors of omission or commission are mine alone.

This is the longer and more complete version of a paper to be read at the May 1983 annual meetings of the American Association for the Advancement of Science, in Detroit, Michigan.

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LAND TENURE ISSUES IN WEST AFRICAN LIVESTOCK AND RANGE DEVELOPMENT PROJECTS:

A Position Paper

by

James C. Riddell
Land Tenure Center

> . . . they realized that an age had ended--an age their elders had told them about, when all of Africa was just a garden for food.
>
> - O. Sembene, God's Bits of Wood

Introduction

This paper addresses the problem of identifying the relevant issues associated with the kind of rights held in landed resources in development projects dealing with livestock and range management in sub-Saharan Africa. There is increasing pressure for the livestock sector to contribute more to national economies as mounting evidence indicates a growing problem of food shortfalls on the continent. Seventy percent of all Africans are to some degree engaged in agricultural production. Yet, despite several decades of development initiatives by national and international agencies, the current FAO figures indicate a decreasing per capita production of food. This is not a new phenomenon. Rather, as Table 1 illustrates, it is a trend characteristic of the entire decade of the 1970s. In 1980 only a very small handful of sub-Saharan countries reported growth in agriculture greater than their growth in population, and these figures included crops grown for export (Lele 1981).

The small increases in production are not the result of new techniques being applied to the better soil and range resources, but rather of maturing adults bringing ever more marginal land into production. This has led to the

TABLE 1

Per Capita Production for Africa
(1969-71 = 100)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Food production	100	94	93	98	95	95	91	93	91	
Total agricultural production, including export crops	100	94	93	97	94	93	90	91	90	

SOURCE: FAO production yearbook (1980).

TABLE 2

Calories Produced as Percent of Requisite:[a]
Africa South of the Sahara

	1960	1970	Most Recent Estimates
Africa[b]	89.5	92.4	89.5
Industrial countries[b]			118.0

SOURCE: a. World Bank, World Tables (1980).
b. FAO, Food composition tables for use in Africa (1976).

TABLE 3

Population Growth Rates: Africa South of the Sahara

	1960s	1970s	Most Recent Estimates
Urban and rural	2.1	2.5	2.7
Urban	5.4	5.9	6.1

SOURCE: World Bank (1980).

destruction of vast forest reserves at a time when Africa is a net importer of wood products and a movement of cultivators onto land suitable only for livestock production. This in turn forces the pastoralists to use more intensively those range resources that were already judged marginal. Our efforts associated with improving food production technologies in Africa are exacerbated by a continuing reduction in the potential of already fragile tropical agricultural soil and water resources.

World attention was briefly focused on the nature and potential severity of major food shortages during the Sahelian drought of 1969-74. After much publicity, logistics, and organizational difficulty, the international community was able to respond with relief aid and food, which prevented the disaster from becoming any worse.[1] Unfortunately, the end of the drought meant an end to the problem for many. Those in the development community, however, saw the need for far-reaching changes on a multinational, regional scale, if future such tragedies were to be avoided.

Relief programs that were initiated in the Sahelian drought crisis have continued. The more attention-getting are those in countries like Somalia and Chad where there are major dislocations associated with war and its attendant refugees and famine. Less likely to be mentioned in the press, however, are the countries like Mauritania where one-third of the grain requirements are met by U.S. PL480 and other international sources, and an additional one-third are purchased by the government on the international market from its already meager earnings from mineral sales (Food Officer, USAID/Nouakchott 1981). Some sort of help must be forthcoming for a country that can produce only one-third of its grain needs--but for how long?

Finding some way to increase food production for most of Africa's arid regions is no longer a luxury but a necessity for both farmers and pastoralists. However, no sharp line divides "farmers" from "pastoralists," or even "sedentary" from "nomadic" peoples. Africa is replete with transitional modes.

What has happened to these economies during the last decade or decades that has resulted in the present state of affairs? After all, each of these areas was able to feed itself at some point in the not-too-distant historical past. This very problem has been brilliantly addressed from numerous points of view. Some have suggested that the market orientation of metropolitan governments has caused them to promote policies that have systematically moved food production from a dominant to a subordinate position (v. Amin 1972, 1977; Franke and Chasin 1979a). Conventional wisdom has indicated that due to the fact that local market demands were poorly developed, rural incomes could be raised by producing for the metropolitan markets those commodities that could not be produced in nontropical environments. We are not the first generation to pursue economic development in Africa. The whole colonial period had economic growth as its major objective. The ideologies of development at play now are all an aftermath of that attempt (v. Johnston 1899).

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1. We recognize, of course, that the relief response also had some negative impacts which created or reinforced some of our current problems.

Other theorists see environmental factors playing a major role. Desertification is one such indicator that has received much popular, as well as specialist, attention. Whether desertification is the result of increased production, both human and animal, on arid regions, the destruction of water-retaining growth by human and animal action (Hall 1980), or long-term climatic trends (Servant and Servant 1980) remains an unresolved debate at this time.[2]

No matter where the cause is eventually assigned, it is the humans who inhabit these arid regions that are the most affected. It is in the zones of the least predictable rainfall that the man-land, land-use, and resource-management policies are most likely to cause more harm than good if they are badly conceived.

These arid regions are, as used by the humans who live on them, broad belts which gradate from desert to savanna grasslands. One broad belt runs from Senegal and Mauritania in the west, to the Ethiopian highlands in the east. This is bounded by the Sahara on the north, and then grades into the Sahel, the western and eastern Sudan grasslands, and is bounded on the south by the forest. The second major belt is the East African grasslands, starting in the Sudan, southern Ethiopia, and Somalia, and extending to Tanzania. The southern savanna fans out in concentric circles from the Kalahari Desert and extends from Angola on the west to Mozambique to the east (Papadakis 1952, 1975; Keay 1959). Twenty-seven percent of the continent is classified by FAO as permanent pasturage, but FAO data also show that for most of the continent the range is decreasing.

Table 4 illustrates that of all the countries lying on one of these broad ecological zones, only one, Cameroon, is able, in the aggregate, to exceed the basic per capita caloric needs of its citizens. Further, only five match or exceed the average for the continent.

These grasslands, averaging usually less than 400 mm of rainfall a year, with some notable exceptions like Northern Cameroons where the pastoral zone receives over 1,000 mm, are best suited to raising animals. Pastoralism, however, represents a very sophisticated adaptation to the environment that represents a continuous development since the neolithic (Allan 1965), dating from at least 5000 B.C. in the Sahara-Sahelian zone and from perhaps more than 2000 B.C. in Eastern and Southern Africa (Smith 1975, 1980a&b).

In spite of its long history of livestock production, Africa is a continent with a very low meat protein intake in the diet when compared to European

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2. Another promising theory is related to the putative advance of the bi-circumpolar vortex (due to pollution in the northern hemisphere) which is then pushing the savanna isohets southward. Desertification, a hot issue these days and although related to livestock development, is not within the scope of the present work. The reason for mentioning a few of the major competing theories is that far too many people we spoke with in the field had already made up their minds as to the cause. At this point in the development of our understanding of the complex processes involved a certain amount of caution is recommended. Planners will, however, eventually have to distinguish between desert encroachment, desertification, and environmental degradation, which are not the same thing at all, but the results of different processes.

TABLE 4

Population Growth Rate and Most Recent Estimates of Proportions of Per Capita Caloric Needs That Are Satisfied in Arid-Land African Nations Exclusive of Outside Assistance

COUNTRY	POPULATION GROWTH RATES 1960	1970	Most Recent Estimates	MOST RECENT ESTIMATES OF PERCENTAGE OF CALORIC NEEDS MET, PER CAPITA
Botswana	1.7	1.9	2.0	85
Cameroon	1.4	1.8	2.2	102
Chad	1.4	1.9	2.2	75
Guinea	2.2	2.9	3.0	84
Kenya	3.2	3.4	3.8	91
Lesotho	1.5	2.2	2.4	99
Mali	2.1	2.4	2.5	75
Mauritania	2.2	2.5	2.7	72
Niger	2.3	3.3	2.8	78
Nigeria	2.4	2.5	2.6	88
Senegal	2.2	2.4	2.6	97
Somalia	2.0	2.4	2.3	74
Sudan	1.9	2.3	2.6	88
Swaziland	2.0	2.2	2.5	89
Tanzania	2.2	2.7	3.0	86
Uganda	2.8	3.7	3.0	90
Upper Volta	1.4	1.6	1.6	78
Africa South of the Sahara	2.1	2.5	2.7	89.5

SOURCE: World bank (1980).

populations. Current figures are given in Table 5. Even if we extract out the data for countries with major pastoral economies, we find much the same picture. This low animal protein intake is not a new phenomenon but is judged at least by one leading archaeologist to be generally characteristic of post-neolithic African economies (Shaw 1977). Such data could, on the one hand, indicate that the European desire for a very high animal protein diet may in fact date from his own pastoral traditions. Very early in the European neolithic, cattle-breeding was already specializing into milk herds and beef herds (Zeuner 1965). The point is: our ideas about the contribution the domestic animal can make to the diet may be an artifact of our culture and not represent a universal value.

Nevertheless, these same data have indicated to planners since the beginning of the colonial period a natural area for development. What better place to start than a vast range with hundreds of thousands of animals in one ecological niche and millions of protein-hungry consumers in another (v. Pierre 1906; François 1918; Aldige 1919). For the French administration of the A.O.F., the Sudan-Sahelian zone represented an ideal place to introduce American-style ranches. By 1929 Piettre enthusiastically endorsed two large sheep-raising

TABLE 5

Total Calories, Protein, and Animal Protein Per Person Per Day
(Africa)

YEAR	CALORIES	PROTEIN GRAMS	ANIMAL PROTEIN
1964	2,088	52.2	9.4
1965	2,105	52.7	9.4
1966	2,113	52.9	9.6
1967	2,106	52.1	9.8
1968	2,120	53.1	9.8
1969	2,138	53.2	10.0
1970	2,148	53.9	10.3
1971	2,155	53.8	9.9
1972	2,123	52.4	9.7
1973	2,095	51.8	9.3
1974	2,115	52.4	9.3
1975-77	2,308	58.7	12.0
1975 (U.S.)	3,500	104.3	72.0

SOURCE: FAO, Provisional food balance sheets (1977); FAO, Production yearbook (1980).

projects using Merino mixtures and also large-scale, for the time, cattle projects using Charolais crossbreeds. All this activity was advocated and promoted by the A.O.F. Inspecteur général d'élevage, M. Carougeau, at the 1929 Congrès International du Mouton. Despite the early fervor, all these projects had entirely failed before World War II (Giraud 1946:7). By 1936 the A.O.F. veterinary service had learned to appreciate the skills of traditional herders in keeping animals alive in what was to the managers of the European ranching schemes a difficult environment. At the 1936 A.O.F. Livestock Conference (Conférence Consultative de l'Elevage), held in Dakar, it was decided to develop the local economies rather than proceed with any more American-style ranching projects. The basic thrust of the new colonial policy was based on a report by M. Feunteum (Livestock Inspector of the Colonial Ministry) which pointed out the low animal protein intake in the traditional diet in the French colonies. The figure was then placed at about 6 kg per year (or about twice what it is today), and the new policy was to stimulate local production to double this figure. The way to do this was to overcome the inertia of tradition through experimental demonstration ranches, veterinary medicine, and, above all, pasture development (Giraud 1946:9 et passim).

By the 1940s we have, then, the development and failure of the basic paradigm that is found in all of the subsequent and current livestock development projects in Francophone Africa: stimulate animal production on already overtaxed pasture resources through improved animal health (veterinary medicine), water point development to extend the range, and preserve the pasture through increased offtake to meet the existing demand for meat. In 1936 this was called "une politique de la viande," and today it is called "développement".

One of our main arguments here is that livestock and range development today uses a basic paradigm that did not work in the colonial period and in all probability will not work any better today. By mid-1979 the international development community had spent something over $650 million on livestock projects in sub-Saharan Africa (Sihms, personal communication 1980). While the sum would represent only a single major highway project in the developed world and one would have to know what proportion (probably very small) that actually reached the project zone itself, it does indicate (for this sector) a fairly sustained effort. The results have not been all bad, but the accomplishments have been minimal at best (v., e.g., Jacobs 1980:1).

This lack of results is accompanied, paradoxically, by a very good scientific literature. Today it is safe to say that we have a better understanding of the dynamics of herd management, etc., than of any other aspect of rural African economy in spite of the need for more detailed longitudinal studies. In such a situation, where we have good data at hand and a good understanding of the relationships between data elements and basic processes, the problem lies with our basic paradigm. A new paradigm will have to emerge out of a comparative analysis of specific factors.

The rest of this paper will try to do just this by examining the area of land tenure (rights held in landed resources) in a variety of recent livestock projects. Since all of these projects attempt to get collectivities of herders to use existing, albeit decreasing, land resources in new ways, whether it be restructured range use, creation of new water resources, or improvement of the quality of the herd for more intensive use of pastures, the question of who has how much right, and when, to these resources becomes an area of importance.

CHAPTER I

Project Description : Mauritania

Nothing demonstrates the dynamic character of land tenure institutions along several dimensions than the changes that have taken place in Mauritania's livestock sector as a result of the recent Sahelian drought. The idea of developing Mauritania's animal products sector had its modern inception in a number of FAC (Fonds d'Aide et de Coopération), UNDP, and FAO studies initiated in the late 1960s. They resulted in a sector project designed by an FED-financed team (Fond Européen pour Développement). The Government of Mauritania then asked the World Bank group for financial assistance, and in 1971 the project was finalized.

The project was to maintain and improve the production of the country's livestock herds in the southwestern section of the country (Administrative Regions 3, 4, and 5), where 50 percent of the population and 40 percent of the animals were kept. This was before the impact of the Sahelian drought had been realized, and the livestock sector was said still to support 70 percent of the population in Mauritania (by drought's end it had fallen to 30 percent).

The major financial commitments of the project were to the improvement of a network of wells, veterinarian health, and the protection of pastures against fire through the rehabilitation of firebreaks. The latter effort deserves special mention.

Throughout the western Sahel firebreaks are an important part of range development. As the project appraisal team points out, this is due to the fact that the growing season for the majority of the grasses, which are annuals, is limited to the three-to-five months of rainy season per year. For the remainder of the year the livestock must subsist on dry, mature pasture, with the amount of forage available variable from year to year. The pastures are relatively unsusceptible to degradation by overgrazing after the seeds have set in September because seeds are usually plentiful for regeneration in the following rainy season.

These facts account for why the IBRD appraisal team emphasized the importance of firebreaks. That is, it is important that the range be protected against fire during the long dry period as there will be no new forage available until the next rainy season. The project documents do not elaborate enough on the fact that herders will often set fire to the range to kill parasites and other pests that inhabit the woody plants. Herders also fire the range in order to remove the dense vegetation from the perennials so that new grasses will have a better competitive eco-niche advantage when the rains come (and the ash does have some beneficial fertilizing effect). Fire, often condemned by earlier investigators (Viguer 1961:24), is not necessarily bad for the range as long as it occurs at the right time and is controlled (Nye and Greenland 1960:36 et passim).

The range, if it is to have periodic burning as part of an overall strategy, must be burned not only at the end of the dry season, but in a time frame to prevent wind and water erosion (G. Fournier, personal communication 1980). The problem of uncontrolled fires is a real and not overly

exaggerated fact. Traveling across the Mauritanian range today, one is able to see fresh fires started each night in clumps of trees and shrubs as the rainy season approaches. This is a fact of current range management practice that should be examined in terms of the current USAID reforestation and afforestation projects.

Accidental fires, fires getting out of control, and fires started too early in the year were a contributing factor in the malnutrition-related deaths in up to 20 percent of Mauritania's cattle before the drought (Project Paper 1971).[3]

The firebreaks were to be a national government effort, put in and maintained by trained Ministry of Rural Development teams. No provision was made to try and develop a local or grass-roots participation in resource management. The same was true for the wells to be developed. Wells were seen as making possible a more even distribution of livestock on the range. At the time the project was designed, the estimated carrying capacity was 1 UBT (Unité Bovine Tropical) per 6-10 ha, and the range was being underutilized. The project argued that the cattle could make good use of pasture up to 8 km from a well that could provide a yield of at least 3 m^3 of water per hour for 13-14 hours per day. Assuming that some kind of effective range management could be incorporated into the overall scheme, each well would support close to 2,000 head.

The bank recommended that no changes be made in the existing transhumant and nomadic pattern of land use, even though the appraisal team felt these were not conducive to modern techniques of animal husbandry. Any changes, the bank's appraisal document argued, would increase losses due to drought. Besides, the document noted (ibid.:6) that the various measures tried for controlled grazing in West Africa had not worked. Finally, it was not a pressing issue then, since overgrazing was not a problem at that time.

The changes that have been wrought on the Mauritanian livestock sector as a result of the drought and the subsequent dislocation of animals and people have meant that all current project designs will have to address overgrazing as a problem.

Tenure Implications. As mentioned above, the project designers take the position that any attempts to alter the traditional transhumant movement of the herds between the dry season pasturage close to the Senegal River and the rainy season utilization of the fresh grasses to the north would be premature. Tenure policy issues emerge along two dimensions: (1) Who has access rights to national range as it is improved? and (2) Who controls and cares for the water points that enhance areas of this range?

Like most livestock projects, the designers leave this issue to be worked out by the herders themselves. The issue is made difficult by the fact that

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3. This whole issue, like so many others, is far from being fully resolved. For example, one effect of early burning encountered in certain situations is the emergence of green regrowth from perennial grasses, which is a highly welcome forage all during the dry season.

there are at least four different herding strategies potentially competing for the same pasture resources. The first would be the large Maure cattle and camel herds, managed largely by the vassals of the noble families (Dubié 1953). The second would be the smallstock herds of the vassals and poor herders who traditionally used the more marginal resources (Toupet 1977; Bonte 1980). The third are the domestic animals of the sedentary populations that will be pastured close to or far from home depending on the conditions prevailing that year. Finally, there are the large herds of the transhumant and nomadic Peul (Fulani) who have been making increasing use of Mauritanian range since 1950 (Wadoud 1980; J. Grayzel, personal communication 1981).

These are problems that will be encountered in most livestock projects in West Africa. In the Mauritanian case, there are several added complexities. The first is the changing power base for the Mauritanian elite. Traditionally, they were all associated in some way with pastoralism. Water points could be appropriated at will by the nobles of a particular region. Which noble tribes and clans controlled a particular area had been determined by battle and treaty. This has been in a state of slow change since the establishment of French colonial dominance and subsequent independence in 1960. Still, in spite of constitutional guarantees, one need not travel far in Mauritania today to see the direct control of valuable traditional resources exercised in a most direct way by members of the ancien régime.

The tenure issue here is whether the implanted resources will enhance the government's attempt to increase the equality of its citizenry in the economic sphere or will lend themselves to the old exclusionary practices. This is more than just an ideological commitment on the part of developers to liberal philosophical notions of economic rights. If Mauritania is to feed itself, those herders who are willing to use the range as efficiently and as effectively as possible must be allowed access to the pasture and water resources. Nobles may or may not be effective resource managers on an individual basis, but class-caste membership is no guarantee. Also, resource use by servile populations is never conducive to capital investment or resource improvement. Any long-term return accrues to the dominant class and not to the user.* This point is somewhat self-evident except that in the project's well-developed program there are to be two components--the first is to improve existing wells, and the second is to put new wells in areas where water is not available at present.

The existing water points are associated with natural sources whose locations are not uniformally distributed in relation to the range. Wells can reach a depth of 75 m, and the deeper the well, the more of a major undertaking it represents to the group that historically supervised its construction and maintenance. Once the project improves these wells, who controls them? New wells will mean that, since they are put in place by the project, any herd can use them. This will alter transhumant routes, introducing competition for the intervening water and grasses where none existed before. These are not insurmountable problems by any means, but they are ones for which some policy will have to be developed.

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* This does not imply that if returns did suddenly accrue to the user, effective resource management would take place automatically without other institutional reforms.

The FAC/IBRD project we have been discussing was designed prior to the full impact of the drought of 1969-74. At that time, 70 percent of the Mauritanians lived off livestock production; today, only 30 percent do. Major droughts have occurred in Mauritania as a fairly expectable climatic variation and we have a more or less accurate historical record dating back to the Middle Ages (v. Nicholson 1976). In this century, there have been droughts in 1913, 1941, and the recent one. Just what effects the previous droughts had on land tenure will have to await historical analysis. One thing we do know is that the last drought has had tremendous implications on the nature of land use and the attendant rights to it.

Historically, as well as today, Mauritania has been an arid region suited mostly to livestock production. Traditionally, as mentioned above, local elites were usually large herd owners. Dryland farming could not compete with the returns possible from livestock production, and the majority of the population that was free to do so turned to pastoralism, leaving the labor of cultivation to those of the lowest social stratum. This historical fact has resulted in a situation whereby the land used by many cultivators was (and is) claimed to be ultimately owned by noncultivators.

As the pastureland became increasingly desiccated, pastoralists moved ever southward and competed with the settled agriculturalists for the limited available resources. The problem was made worse by the fact that all during the 1960s the rainfall had been higher than average and the herds had expanded. By 1968, the year of the highest recorded rainfall, the national herd was estimated at close to 10 million (World Bank 1971).

The drought continued to worsen at a steady pace, and only three years later, in 1972, there was the lowest rainfall ever recorded for the region. The effect on livestock numbers was equally dramatic. The national herd fell from 10 million in 1968 to approximately 7.5 million.

This overall 24-percent reduction does not tell the whole story, however. Whereas the more drought-resistant sheep and goats were reduced by 14 percent and camels by only 7 percent, cattle, the mainstay of a majority of the pastoralists, were reduced by 55 percent (Government of Mauritania, Third plan of development 1980:40-42).

The rainfall continued below normal, and even the most desperate measures could not prevent herd after herd from falling below levels of economic viability. Consequently, a large proportion of those people who were traditionally pastoralists and who exploited an arid grassland environment abandoned that way of life and encroached upon the agricultural population. Thus areas with the greatest development potential, such as water points or land in the recession flood basins, became crowded and prone to conflict and displacement.

The foregoing explains the reason for the present dynamics of the situation, why we have so little data on the actual land tenure systems in operation at any given project site, and why it has proved so difficult for the Mauritanian government to formulate effective policy in these matters. One point is abundantly clear: we cannot depend on traditional rules to reflect the ongoing, day-to-day activities vis-à-vis the land. As is the case with most resource conflicts in Mauritania, fighting is not over control of areas

of high potential, but rather over resources that can be described as only marginal and can be made productive only through sustained and coordinated efforts by everyone. It is, therefore, the relative value, not the absolute value, that makes them important.

Traditionally the range was divided into definite grazing zones that had been established by conquest and negotiation. Unlike most parts of the Sahel, rights to a particular pasture area were exclusive to the ruling "noble" kinship group and its retainers. These "owned" ranges included dry season as well as wet season grazing zones, and all the cultivator communities belonged in some way to the dominant pastoral group.

This is not to imply that there were no overlapping ranges. Rather, the ranges tended to be more exclusionary than elsewhere in the Sahel. The situation was never completely stable, but changes began to accelerate after 1930. In 1934, the French colonial administration passed a decree that all unowned forest resources were national land. While the decree did not specifically include range, it did open the possibility that some resources were owned by all. In addition, Sahelian herders cut tree branches for animal fodder in the dry season, and trees are part of livestock management strategies.

Still, up until the mid-1950s the competition was between Maure groups. After this date the Peul began to enter into formerly exclusively Maure pastures (Wadoud 1980). In 1960 a law was passed making all vacant or unimproved land state land (Law 60.139, Article 1). This law is consistent with Islamic precedent: range is Ardh Mawat (dead land) and is open to all because it is made productive by rain which belongs to everyone. How much of the Fulani advance was due to these decrees and how much is due to loss of military power by Maure groups has yet to be determined.

Range management projects find themselves in a dilemma of trying to discover some sort of principle of exclusivity of range use after just such a system, with all its attendant inequalities, had ceased to operate, and to try to do so with a range and herd composition completely altered by the drought. The Direction Elevage (Livestock Department) estimates that sheep and goat populations have fully recovered their pre-drought numbers. The difference is that they are using a smaller range and are owned largely by sedentary groups. Some form of policy will have to be developed defining rights to range resources, with all the competing historical claims, before anything in the way of development can take place. National forests exist without trees that have served as animal fodder, and the chance of a new forest surviving is slim without such a policy.

The post-drought period has stimulated several project designs to help the devastated livestock industry recover. USAID is involved in improving livestock production in the Selibaby region through its integrated rural development project. This project rightly sees animal husbandry as just one aspect of a regional economy. Project personnel are working closely with animal inspectors and health services. The most startling result of this project in the area of land tenure and management, however, is associated with its natural range demonstration zone. The regional government allowed the project to fence off a small sector of the range to provide a demonstration of what the pasture would look like if it were not grazed. The contrast is startling.

On one side of the fence there is bare ground, with small tufts of grass here and there, while on the other side are waist-high, fully mature savanna grasses. One will remember that the World Bank appraisal team found no evidence of overgrazing in the pre-drought and immediate post-drought periods. The greater population concentrations in the southern regions of both people and livestock in the post-drought period have meant that overgrazing is a very real problem in all current livestock-related projects. Overgrazing is a serious accusation that implies long-term deterioration. The technique of fencing off an area and protecting it from grazing can only indicate heavy grazing. To conclude that overgrazing occurs requires a very long-term study, especially in arid regions. Again, the problem with the term "overgrazing" is that all too often it is used too lightly and, usually, when one really means heavy grazing. As a result, project solutions talk about "grassland protection" which exacerbates the land use and tenure issue since it invariably takes land out of active production and use. Coupled with advancing crop cultivation, game parks and reserves, etc., less and less land is left for livestock production.

The Dutch government has just initiated the management of a pastoral project outside of Kankosa. The project calls for the formation of herder associations that will be organized around the water points to be developed by the project. In spring 1981, when members of the Land Tenure Center visited the project, the team was attempting to initiate the first census. At that time, specific reorganization plans had yet to be formulated.

USAID is in the final stages of developing its livestock project, but is viewing it, quite rightly we feel, as part of an overall resource development effort. That is, livestock development will be integrated with reforestation, afforestation, grassland protection, and water point development. The basic tenure issues are, of course, those we have outlined above: Who really controls the resources, allocates use and protection? Also, given the social constraints of vested resource control in Mauritania, its class structure and almost feudal-like institutions, and the fact that more and more of the population are crowding onto the land closest to the river, major tenure issues will have to be resolved by the government based on a realistic land allocation policy. The Mauritanian officialdom has so far been unable to formulate any effective land policy that has been carried out in a systematic manner. All projects will have severe tenure problems, but the success or failure of a project may be beyond the control of the project personnel and depend on the host government's willingness and capability to provide leadership in this area.

CHAPTER II

Senegal

The problem of just who will constitute the group holding use and allocation rights to land resources created by a project is also central to a series of livestock projects in Senegal. Two of these projects are located in Eastern Senegal, and the rest are in the Ferlo region of Northern Senegal.

By 1971 the Senegalese government realized that the combination of greater demands placed on the livestock sector by urban consumers and on the Senegal River basin to grow more grain meant that a plan had to be developed that would make these two sectors of the national food economy complementary to each other. These needs were underlined by the 1972-73 drought which caused an estimated 15 percent drop in the national herd. Until 1972, Senegal was able to meet 80 percent of its meat needs, with the rest coming from Mauritania. With the greater devastation of the drought on the Mauritanian herds and the subsequent shift in the Mauritanian economy, greater productivity was going to have to be developed in the national livestock sector.

In 1971 the World Bank had prepared a project identification report, and on the basis of this document and its findings the UNDP financed a project design. This was done by SATEC (Société d'Aide Technique et de Coopération) in 1973-74. By 1976, when the first project was begun in Eastern Senegal, the loan agreements and grants had reached $13 million.

A 1.4-million-ha region was selected in Eastern Senegal because the poor soils were judged to be unsuitable for cultivation. This area was said to contain perhaps as many as 30,000 livestock owners (World Bank Appraisal Document 1971). The basic idea was to organize these people into 65 grazing units, each of which would be given exclusive land and water rights. In order to achieve resource parity among the 65 units, the project would construct an estimated 100 wells.

In addition, due to the problems associated with grass fires that are similar to those discussed above for Mauritania, 2,400 km of firebreaks were designed into the overall plan. They will also serve as boundary markers between grazing units and for pasture rotation. The project design team estimated that grass fires destroy up to 50-to-70 percent of the project-area range each year (ibid.:Annex 4).

The World Bank foresaw this project as serving as a test for developing an overall master plan for livestock-raising in Eastern Senegal. It included, therefore, many more components than we will be discussing in this paper, such as credit programs, literacy, animal health, and training.

The World Bank project, however, does not cover the whole region, and the Government of Senegal asked USAID to design a complementary livestock project for the area east of the World Bank's project (USAID/Government of Senegal 1980:Annex 1). Therefore, it is not at all surprising that the USAID design team closely followed the major outlines of the project proposed by the World Bank.

The USAID project, similar in that it hopes to introduce managed grazing reserves, comprehensive health programs, training, and firebreaks, also differs in several important respects. The principal one is in terms of water point development. Instead of the wells proposed by the World Bank project, USAID will emphasize catchment ponds, sand reservoirs, and dikes. If well executed, this would provide an ingenious method of range management, as the length of time water would be available for each part of the range could be engineered into the size of the catchment ponds, etc. In addition, the herder groups will be organized around existing villages.

In both the IBRD and the USAID projects, the critical tenure issue is the transfer of exclusive use rights to the persons making up the herding groups. In both a legal and a sociocultural context this is recognized in both project documents to be a difficult task. Senegalese Law no. 64-46, formalized in 1964, nationalized all nonregistered land, to which individual citizens have only use rights (Kouassigan 1966, 1977). This new law was promulgated for a variety of reasons, but one among them was to help those individuals who wanted to use land in more modern ways escape the often restrictive institutions that characterize the relationships between producers and controllers of land, especially along the Senegal River (ibid.; and Décret 1142 du 17 décembre 1976).

Impact of this legislation in Eastern Senegal, at the local level, has been minimal; but a project, if it is to accomplish its goal, will have to formalize the relationship of participants to improved land resources if there is to be any longevity to these improvements. The legal process faced by project personnel is cumbersome, to say the least. The government would have to declare the area a development zone and then assign primary responsibility to an acceptable, established, parastatal organization. In this case it will be SODEFITEX (Société pour le Développement des Fibres Textiles), following a recommendation by the World Bank based on the parastatal's experience and previous record.

Once the request to have an area declared a developmental zone is made by an acceptable parastatal, it must be approved by the Ministries of Justice, Finance, and Planning, the Prime Minister, and finally by the President. The IBRD appraisal team estimated that the first step, if undertaken, would take at least three-to-four years (1971:Annex 4). Once the land has been entrusted to SODEFITEX, or a similiar organization, it cannot be transferred to the users until they are organized into legally constituted bodies, such as cooperatives, etc.

It would seem that the USAID project would have an easier time of it in this regard since it plans to use already existing villages as its range management units. It turns out, however, that the Senegalese government does not include villages in its legal governmental hierarchy (v. Code Administratif). Rather, each village or village-group herding unit will have to be organized first into a pre-cooperative with an elected council, grazing committee, and president.

The group (either the USAID village or the IBRD herding group) then must enter into a contractual arrangement whereby it agrees to follow grazing rotation, maintain firebreaks and water points, apply veterinary medicine measures, follow prescribed breeding practices, and participate in all education and

training programs. In exchange for this, they will be given exclusive use rights to a section of the range and its improvements. Security, however, exists only as long as they follow all the rules. Therefore land tenure is to be used as incentive for acceptance of development tactics.

Anyone who has worked in African livestock development knows that the changes in group resource control outlined above will not come easily. The projects, as planned, foresee the most profound changes in land tenure; yet neither project explores the social, political, and cultural ramifications of the contemplated changes in rights. The IBRD team was well aware of the difficulties of granting exclusive rights under Senegalese law (Korten 1980:14) (presumably, the USAID project team did not feel compelled to investigate them as the IBRD team had already done so, since they are not discussed at all). What was missing in both cases, well intentioned and thought out though they were, was any investigation, reference to, or speculation on the actual land tenure rules in operation (USAID Project Paper 1979:44, expresses just this need). Subsequent research and data gathering by project personnel, Senegalese social scientists, and LTC staff indicate that the project has a very different socioeconomic base from that assumed by the original project designers (v. Equipe SEPH 1980; C. Kane 1980; USAID/Bakel Report 1980).[4]

Both project documents assume that the dominant populations living year-round in the area are Peul and that they are primarily herders. In actual fact, they tend to be Toucouleur, that is, cultivating populations that keep cattle as a capital investment (v. Equipe SEPH 1980:23). Cattle are allowed to roam unguarded during the day and are managed only to the extent that they are expected to wander home in the evening for milking, etc. When the USAID project director and I sat down with village headmen and showed them the degree of erosion that had taken place in recent years by comparing with them aerial photographs or their particular village area, they all agreed to the damage and to the cause--the village cattle were using the same low-lying areas as exit and return routes each day. When the rains came, these became natural runoff troughs since no vegetation remained. It turns out that most villagers cannot really control their herds and, when this is necessary during the season that fields are reaching maturity, they must hire Peul herders from the north.

Toucouleur villages are noted for their caste-like, hierarchical organization (Wane 1969). It was stated in both the written reports and our interviews that all castes had cattle. Yet we also found that each village probably has a very few major herd owners and many small ones. This raises the issue of exclusive rights to resources in a village and how broad-based the intended economic incentives will be.

Our interviews tend to indicate a remarkable autonomy for each village. This makes the role of the village chief critical in project administration.

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4. The following comments are not meant to connote an attitude that, "if only we had been asked, these kinds of things would not have been ingored." Rather, they are data discussed over many enjoyable evenings in a most collegial manner with project personnel, Senegalese counterparts, and villagers and herders.

He, as a descendant of the original founder, admits any new members, and all other residents will owe the chief or his ancestors the recognition of this fact (v. Equipe SEPH 1980:36). He is also the center of any conflict settlement--something that is bound to occur as rights in range and water resources become defined by the project. Neither project document discusses the chief's role in the new tenure relations that are proposed.

In the USAID project, the villages are unevenly divided between the three long-established villages and the six that have been established since the turn of the century. (Two villages are unaccounted for as they will not discuss their history with project personnel.)

The point is that the more recent a village, the more clear is the memory that it has been built on established transhumant routes. In a sense, the herds preceded the people, and the herders from the north have some residual rights in the area that may make it difficult for them to see why old migration routes and watering holes are being assigned to relative newcomers, unless they are compensated in some way.

Although one expects to find some form of economic relationship between the villagers and the herders, there is very little interaction of an economic nature between the two groups. The migrating pastoralists do not herd cattle for the villagers, nor do the villagers charge for water or grazing. Large herd owners in the villages may hire herders from time to time during peak labor periods, but they contract individually with men looking for work. Smaller herd owners will group their animals and take turns managing the larger collective herd. This seems to take place only during the final months of the rainy season and during the harvest period.

Where does all this leave us? We have two projects designed to handle pastoral populations, and it turns out that they are settled cultivators who invest in cattle as a form of savings. It is not a form of savings function that we normally associate with West African pastoralists. In Eastern Senegal, among these settled populations, we find--as we do all across the Sahel for similar cultivators--a form of investment in livestock that appears to be most irrational. In the project zone, farmers are purchasing cattle, etc., after the harvest, when grain prices are lowest and cattle prices are highest. They then sell cattle during the lean periods in the dry season when live cattle and carcass weights are lowest and grain prices are highest. Although LTC staff members have observed this form of cattle-grain trade-off from Senegal to the Cameroons, we have yet to discover a good explanation.[5]

Its implications for tenure are clear, however. Before such populations form the nuclei of groups granted exclusive rights to range and water, the problems of residual usage rights of the pastures by transhumant animal keepers

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5. A look at household economies may give some explanations, e.g., need for cash at harvest time for taxes, school fees, etc.; we must also look at who is selling what to whom, and not aggregate figures. Also, are there any alternative forms of savings that would give farmers cash to make livestock purchases at any other time?

will have to be resolved. Second, since cattle are a form of savings of remittances from relatives abroad, etc., the overall role of animal production needs to be understood before exclusive rights are conferred. Third, given the differential size of the herds owned by different individuals, are we developing range resources and then assigning them to individuals who already have the means to help defray some of the expenses involved? That is, through the proposed tenure arrangements, we may be freezing a social differentiation that has already demonstrated a nonresponsiveness to range management. Finally, before we change tenure rights in these vital resources, we will need to know who uses each range, when, and how long, especially in light of the erratic rainfall patterns. In poor rainfall years, who goes where, and how are these reciprocal emergency accommodations to be handled in terms of our new tenure system? The basic data have yet to be collected (USAID/Senegal 1980, Annex 1:17).

The USAID/Senegal Evaluation Document (ibid.:10-11) argues most cogently that, in contrast to our conventional ways of thinking, the deterioration in the condition of the range in Eastern Senegal may be due more to the actions by cultivators than to the large herd pastoralists who are moving through. Cultivation, by its nature, tries to eliminate wild grass propagation. As the soil becomes exhausted and is left to fallow, the natural grasses do not necessarily regenerate fast enough to prevent wind and water erosion.

If indeed, as the data seem to indicate, we are dealing primarily with cultivators who keep cattle on a haphazard basis, then perhaps we should be looking to projects with a more mixed farming orientation, where the domestic animals are used to enhance marginal soils. Cattle in this case would become an investment in the overall agricultural strategy rather than functioning as a form of savings for remittances or grain preservation strategies. In this approach, the tenure implications would be equally different.

SODESP

In the above case of the two Eastern Senegal projects it was made clear that there is a need to be sure we know what kind of livestock managers we are dealing with before we start assigning exclusive rights to large-scale resource bases. The Northern Senegal range projects do not represent any confusion in this regard; all the populations involved are traditionally animal managers.

Northern Senegal, primarily the Ferlo Desert region, has been divided into five project zones that will be assigned to various international donor/development groups. For example, the responsibility for Zone 1 has been assumed by FED, while the Canadian CIDA organization has asked for Zone 2. USAID has been asked to develop a project in Zone 3, the westernmost zone, and Zones 4 and 5 are yet to be allocated at the time of writing. All the projects are to follow the same basic plan and to coordinate efforts as much as possible to ensure a consistent regional development under the general direction of SODESP (Société de Développement de l'Elevage dans la Zone Sylvo-Pastorale), a parastatal organized in 1975 (Loi no. 75-61, Décret no. 75-874).

The SODESP projects represent a major effort, with USAID and other donors already willing to commit something in excess of $29 million. There are several reasons for wanting to expand the production capabilities of the Ferlo region. One of the primary stimulants is that during the recent major drought,

1969-73, it became apparent that Sahelian countries were going to have to make much more intensive use of the major river basins, and the Club du Sahel was formed to initiate and coordinate plans (Lateef 1980). This means that as the Senegal River basin is developed, the animals that are currently kept there during the dry season will have to be moved elsewhere since irrigation will permit year-round cultivation.

The Ferlo has been used by pastoralists for generations, but nomadic groups began to settle there, to any degree, only in the 1950s when the French colonial office began to put in deep wells (Sall 1977). This was also the same time when nomadic groups from this region began moving into Mauritania (Wadoud 1980), but the relationship between these two events has yet to be investigated. As the wells in the Ferlo were put into operation, they became centers for human concentration and also terminal points on transhumant routes. Those who settled around the water points began to plant small fields. At least two researchers have noted that these settlements have not produced oases, but, rather, have contributed to desertification (Reboul 1978:135; Sall 1978)

Of course another driving force behind the formation of SODESP and the specific project designs was the need to rebuild the national herd after the decimation caused by the 1969-73 drought. In the eastern Ferlo it was estimated that cattle numbers had been reduced by as much as 60 percent (Sall 1977:39). Planners saw the Ferlo as an ideal place to serve as a breeding region in a stratified range production system, and this has become the heart of the SODESP strategy. Once the young stock reach two-to-three years of age, they will be bought from the herders and fattened for market, either at SODESP stations or in feedlots closer to urban centers. This idea has a historical basis in the area. As Sall (ibid.:43) points out, a small number of traditional herders practice a type of stratified herding regime, in that they specialize in raising and selling primarily young animals. But, he also points out (ibid.) that there has been a strong cultural resistance to this by a vast majority of pastoralists in the region.

In more directly tenure-related areas of interest, the SODESP plan calls for the development of a series of major well sites, approximately 30 km apart, in each of the five project zones, which would become infrastructural centers. The area around each well/pastoral center would be divided into pastures that would be rotated. Before a herder could use the water or the services of the center on anything other than an emergency basis, he would have to join in a contractual relationship with SODESP. In exchange for membership, he agrees to sell, either to SODESP or independently if he can secure a better price, the required offtake. In addition, he will brand his animals, use the prescribed feed supplements, and so forth.

For its part, SODESP will provide credit, deny access to the range to nonmembers, especially herds coming down from Mauritania, and give price incentives to herders to sell young animals at a value commensurate to the return expected on a young animal once it reaches maturity.

There are many positive features of the overall strategy that are well thought out and seem to be well received initially by local herder populations (personal communication with project staff at project location, August 1980). However, the USAID project paper points out that the range management and land

tenure components are less developed than those devoted to increasing production (USAID Project Paper 1980:23; Annex L:2 et passim). The document (Annex N:8-10) outlines the terms of reference for a much needed land tenure study.

Although some form of exclusive use may be desirable for range preservation in the Ferlo (Sall 1978), it will have to be done in ways compatible with the real nature of the long-term sociocultural adjustments to a harsh, drought-prone environment. Many of the local pastoral groups had become relatively sedentary during the 1950s and early 1960s due to well development and to an unusually abundant rainfall during that period. During the drought, a willingness to move vast distances to meet animal needs and to reciprocate when others were in need resulted in fewer Peul giving up and moving to the cities relative to other rural producers in Senegal (Santoir 1976).

For the foreseeable future, a certain flexibility in land tenure is going to have to be maintained. For instance, the wells are large and complex, and there are bound to be periodic breakdowns. What would happen in this situation if tenure rules have become too rigid and unresponsive? The adjustments in such an event--just as they would in the case of another major drought--will be ad hoc and a spontaneous mixture of traditional practices. The point is: the new tenure rules that emerge as the populations become increasingly tied to a settled, petite transhumance way of life at well locations will have to have an evolutionary and dynamic character.

CHAPTER III

Niger

In 1979 members of the LTC staff had the opportunity to visit the field site of two livestock projects, one by USAID and the other by the World Bank, in Niger. In this situation the World Bank's project follows the basic design suggested by USAID in their Niger range and livestock project which was initiated in 1977 with a budget of $5.3 million. USAID's efforts were prompted by a request from the Nigerian government following a SEDES study financed by the FAO and finished in 1976 (FAO 1976). The government was seeking assistance in revitalizing the livestock industry in the central and southeastern sections of the country, where over 50 percent of the national herd is found and where estimates of loss during 1968-69 and 1972-73 due to the drought itself and to drought-induced sales reached perhaps 60 percent or more (Sutter 1980).

Much of Niger, like Mauritania, is an area suited to little else than range-related agricultural pursuits. Only 10 percent of the total land area is judged suitable for arable cultivation; 15 percent is semi-arid; and 75 percent is desert. The rural sector accounts for 40 percent of the GDP and 30 percent of exports, of which livestock account for 30 percent and 67 percent, respectively (USAID/Niamey).

The pastoral zone, which is legally defined as the area with between 200 and 400 mm of rainfall annually, stretches from the Malian border on the west to Lake Chad in the east. Within this zone of 23.4 million ha, 600,000 pastoralists, predominantly Tuareg and Peul, are responsible for a greater part of a national herd of an estimated 6 million UBT (FAO 1980). Of increasing importance in terms of land tenure considerations is the continual movement of cultivators and their small herds into the pastoral zone. This provided the third part of the problem of effective range revitalization at the time the projects were designed. The first problem identified by the SEDES study was range deterioration. As more animals gathered on those parts of the range serviced by large government wells, the range naturally deteriorated. The second part of the problem concerned the fact that the two different ethnic groups dominating the pastoral economy each relied on a different system of range utilization.

The Tuareg are the historically dominant population in the area. They have long been involved in markets, trade, and long-term relations with cultivator and urban populations to the south (Baier 1974). Traditionally, they were noted as camel specialists, with goats and sheep as a secondary specialty. Since the drought, they, like all Sahelian groups, have diversified their herds with an increasing dependence on cattle and small stock (Bernus 1974; 1979). Again traditionally, they were characterized by remaining relatively sedentary during the dry season in the south, and then, as the rains provided forage and new browse to the north, they would move to the Agades region for the cure salée (Bernus 1974; Smith 1980). Since the entrance of the Peul into the region following the French domination and pastoral displacement due to population growth northward and the expanding Sahara southward, the Tuareg are increasingly reluctant to leave their southern dry season pastures following the rains for fear others will overgraze it.

The Government of Niger has called for all land tenure policies in the projects to follow as closely as possible the traditional systems. In the Tuareg case this would have been somewhat simplified if the Peul had not entered the picture. Tuareg range management traditionally centered around the control of wells and water points in the southern range. These wells were owned, and there was a degree of control over who could use the surrounding pastures by limiting who had access to water. Also, in the pre-colonial period the Tuareg were militarily dominant, and force of arms could be resorted to for control over a particular range. The Tuareg may have dominated militarily, but they needed trade. With per capita millet consumption estimated to be as high as 150 kg per year, they had to have a source other than oases, etc., in the north (Baier and King 1974:16). Tuareg nobles dominated certain villages in the south that had to pay tribute and provide hospitality for all of a particular noble's followers.

These southern villages provided both the needed grain and a retreat in times of drought. Further to the south were the urban communities of northern Nigeria like Kano and Sokoto. These were the commercial, banking, manufacturing, and storage centers which prospered from the ready market to the north for their surplus production (ibid.:17).

Drought being an ever-present potential fact of any herding season and strategy meant that the pastoral sector could exist only as part of a larger regional economy providing access to pasture in times of short rainfall and a market for the exchange of desert and Sahelian products. For this reason, the Tuareg noble lineages jealously guarded their rights to extract surpluses from the villages they dominated. In the retelling (v. Lovejoy and Baier 1976), it sounds somewhat ideal. By controlling both northern pastures and southern villages, the Tuareg were able to weld together a long-term, successful strategy for dealing with a harsh and parsimonious and unpredictable environment. From the point of view, however, of the populations long dominated by the Tuareg, the take-over by the French in 1918 resulted in little nostalgia for old social and land tenure regimes. This has two implications for current attempts to introduce control over specific pastures.

Following the French dominance in the region, the colonial power saw the major threat to its suzerainty primarily in the Tuareg. Therefore, they supported the claims of villagers and all formerly subservient groups in matters of land tenure. Also, as a majority of the present administration in the project zone come from ethnic groups formerly dominated by the Tuareg, there is little chance that Tuareg will be willingly given a great deal of control in the project zone.

This historical factor of dominance and competition for control of the region also helps account for the emergence of another major pastoral group in the area in the last 50 years. After the French removed the Tuareg as a military threat, Fulfulde-speaking herders (Peul in French, Fulani in English), who refer to themselves as Wo'daabe as opposed to Bororo in Cameroons, etc., began to herd extensively in central Niger (Dupire 1962a; Horowitz 1972; Stenning 1959). These are a branch of the same Peul who make up the dominant population in the Senegalese Ferlo project, and in Mauritania they have a relationship with the Maure much like they have with the Tuareg in Niger. They are considered to be superior livestock managers, being able to create a new niche

in existing pasturages due to the highly flexible and self-sufficient single-household herding units, as compared to the Maure and Tuareg herding groups composed of family members, vassals, retainers, and subservients. They are primarily cattle-raisers, but, like the Tuareg, they have diversified their herds since the drought and have even taken up camel-racing like their Tuareg neighbors (Sutter 1978; 1980:18).

This form of range utilization, all other things being equal, would seem ideal. The herds would tend over time to gravitate to where the range is best and leave overutilized regions to regenerate (v. Horowitz 1975). Such a system, however, precludes anything other than a spontaneous rotation of the range in response to very short-term perceived needs. In 1979, while visiting a gathering of an estimated 104 family herding groups at Birmou well, who were celebrating the prophet's birthday, the question of range control was raised. To say that the question generated a considerable amount of heated discussion would be an understatement. There was no debate, however, just rejection of the idea on the part of the pastoralists themselves. Various explanations of the benefits of the idea of range management and rotation were presented by a veterinary inspector, a Peul chef de groupement (government-appointed chief), a Nigerian counterpart in the USAID project, and a member of the LTC. We were told that, if there were fences they would be crossed (by others, of course; the present herders would only follow after others had destroyed the fence), and they cited examples of where that had happened. When it was pointed out by the chef de grouppement that the government could enforce it if it chose to, the majority of herders seemed to favor moving to Upper Volta, Chad (in spite of an ongoing civil war), or Cameroons. We will return to this when we discuss specific project goals. In an area where less and less land is being devoted to livestock, and where the quality of this remaining land is low, the solution is not to fence protected areas and allow natural revegetation. This takes too long and further aggravates the quality of unprotected areas. A more acceptable solution is to speed up the revegetation by seeding or other means.

Traditional land tenure of the herders in its overall strategy does not lend itself easily to contemporary, modern range management ideas. In addition to the difficulties of range deterioration and multiple ethnic group use is a third one, namely, the constant movement of cultivators north of the official line demarcating the pastoral zone. Since the loss of power by the Tuareg in 1918, almost all conflicts between cultivators and herders have been ultimately judged in favor of arable agriculture.

Not only are farmers moving across a broad belt, in small villages north of the line they also are to be found at modern high-yield well sites that were put in for the benefit of herders. This movement, in addition to the movement of the Sahara southward, means that each year there is less and less range available for any kind of management.

Cultivators present another problem to the land tenure component identified by the projects. First, if the range is to be protected and deterioration halted (original SEDES study) and livestock production raised, both the herds and the land in cultivation by sedentary populations must be taken into consideration. Cultivators take advantage of the free range created by the French in two ways: first, they plant their crops on the best soils of what is essentially a free commodity; second, they then put their small herds onto the

surrounding range (Bonte 1967; Mainet 1965). Even though each individual villager's herd may be small by comparison with pastoral populations, in the aggregate they are an important factor in the use of the southern dry season pasturage and therefore in reversing range deterioration. This means that the arable fields are controlled under land tenure rules traditional to the Hausa, etc., while the remaining range is at the same time village commons for one ethnic group and dry season range for another ethnic group. This has resulted in two changes for the pastoralists. For the Tuareg, there is an increasing reluctance to leave dry season pasture unattended during the rainy season, to return from the cure salée to find others have grazed on it in your absence. For the Peul, it has meant an ever-northward movement of the dry season range--increasing susceptibility to overgrazing and drought, on the one hand, and moving these herders ever-farther from access to national and project infrastructure, on the other (Sutter 1978).

Both in terms of governmental initiative so far--historical precedent in the colonial and post-colonial land adjudication, or lack thereof--and in terms of simple demographics, the herders cannot hope to find an easy solution. Ninety percent of Niger's population are cultivators and, until a viable solution is found to their problem, pastoralists will always come out second best.

It has been suggested that since increasing numbers of animals are kept by cultivators, it would be much to our advantage to halt any attempt to keep transhumant and nomadic systems functioning at all and to concentrate on mixed farming systems (Hodder 1974). There are at least two arguments against this in terms of environment and economics. The northern Sahelian zone, with its rainfall average of only 150-300 mm per year, is much more rationally used as a breeding zone for a livestock industry rather than for extremely poor and chancy grain production. Also, as Delgado's detailed study of a similar situation in Upper Volta clearly demonstrates, the returns from the present ethnic specialization are much greater than from mixed farming under currently available technology (Delgado 1979).

It is against this current dynamic social, economic, and land tenure situation that livestock projects must attempt any positive interventions that will provide long-term environmental and economic viability to the livestock sector. The USAID project area covers around 4 million ha, primarily of grazing land, in central Niger. Basically, the project is a research and pilot effort to establish the basis for a plan to be developed later for increasing the income and well-being of the herding populations while enhancing and preserving rangeland resources. Detailed studies are to be made on population, resource utilization and availability, social organization, and social and economic institutions. After the data have been analyzed, the project paper proposes that herder community aides be organized into a network to report on veterinary and market problems as a way of providing local assistance in extension work, with all extension materials developed in reference to local perceptions and customs.

All of this will serve as a framework for forming pilot herder associations. Initially there will be one or two associations made up of herders on contiguous grazing areas (both Tuareg and Peul), who will meet together to examine their common problems in terms of range management rather than as difficulties in individual herding strategy. This model, if it works, is also

designed to facilitate the development of a sociological research capability in the Nigerian Livestock Service to design and implement other herder studies and innovations.

An important component of the sociological research will be a study of the legal and sociocultural issues of land tenure. The USAID project has come in for some criticism in certain quarters for taking so long to reach any definitive implementation. It is our contention that, since we are still looking for a range and livestock project design in the Sahel that succeeds in limiting access to the pastures, the explicit recognition of the difficulties and dynamics involved at the human-participant end is to be lauded.

The World Bank's project is to the east and south of the USAID project zone and covers an area of 324,000 km^2 and the better part of three provinces. Its goal is to raise rural incomes through increased animal production for both the pastoral and the cultivating populations. It also sets out to create pastoral associations that are "based on traditional patterns." Each of these newly constituted associations will be allocated exclusive use rights to a dry season and a rainy season pasture and a transhumance corridor, as well as to any wells that are put in (30 are planned). The research component of the World Bank's project is more along the lines of follow-up studies than field analyses providing the bases for implementation.

Both project papers address a series of tenure issues explicitly and implicitly. In the World Bank's project, the allocation of wet and dry season range resources as well as boreholes and wells seems more applicable to the Tuareg herding strategy than to that of the Peul. Any strict application would not provide adequate flexibility to deal with the dynamic environmental and social situations described above and will have to be modified as conflicting situations arise. The World Bank's project paper does not set any prescribed way for handling this, as does the USAID document with its ongoing research component.

While the USAID project paper states repeatedly that traditional tenure and use rights for land and water must serve as the basis for any plan, it is quite clear that changes are to be made--"the problem is one of who can take the first steps toward . . . a more limited land use system"--and the project sees itself in the position of an activist "honest broker" (1980:46). The abuse of the range is seen as the "result of the inevitable clash between private ownership of livestock and the free and undirected use of a public resource" (ibid.:95). Therefore, following a succinct review of the evolution of western U.S. grazing management (ibid.:125-27), it is suggested that "American land management policy and philosophy should capture the attention and interest of the GON ('Government of Niger') . . ." (ibid.:128). Once formal rights are given, it is envisioned that, ultimately, titles will be issued (ibid.:132).

In sum, the USAID project is impressive in its commitment to first studying the very complex mosaic of ecological, social, economic, and technical factors at play before taking any specific actions. Still, an underlying assumption is that more control is needed. Such control may very well prove impossible given the almost constant state of flux as well as the still-evolving social relations between Tuareg and Peul. If Faure and Gac are right, and

the zone returns to a wetter-than-average rainfall and more favorable grazing and water conditions (1981:477), the extension of the pastoral zone northward could change migration patterns dramatically, encourage the buildup of larger herds, and cause a breakdown in herder associations and management plans as pastoralists see benefits in returning to less structured systems in times of more bountiful resources. The point is that any land tenure rules for the foreseeable future must also be dynamic and flexible and perhaps initially different for Tuareg, Peul, and sedentary populations, just as they are now. There is nothing to indicate that there is only one right system for everybody.

Where, then, would we begin to look for a foundation upon which to build a land tenure policy for rangeland in a country like Niger? The western American experience following the Taylor Grazing Act is suggested as one possibility in the USAID project paper. Land tenure took on its current meanings in Anglo-American law, for example, only after land began to have exchange value. The reforms of 1686 only codified ad hoc, spontaneous development that had been taking place during the preceding century. Since that time we have seen the steady elaboration of ever more complex forms of rights held in landed property. One may sell the oil, etc., below the surface while still owning the rest, and vice versa, or be an absolute owner of a piece of property for only a short, specified time each year, such as the owner of a beach property for one month. These arrangements are not at all unusual, and the legalistic conventions involved only codify the various exchanges possible and define what is involved in the act of exchange itself.

We can see that this whole body of precedent in Western land tenure is the result of evolutionary sequence that has no real parallel in the Nigerian pastoral zone. In the project area, rangeland has no exchange value, neither does the grass. The major landed resource with exchange value is water and access to wells. It is here where a land tenure policy has its best chance, and we need to explore what spontaneous rules are evolving in this domain.

Since the French conquest of the area, the Tuareg have lost control over the former serf villages, oases, trade routes, and perhaps pastures that had the potentiality to be exchanged by purchase, treaty, wirguild, or contest of arms. Only the former control over wells remains--a person or a group of persons who has put in a well owns that well. The Peul have, over the last twenty years, begun to follow suit and purchase or hire wells dug in their summer range. When a well is owned by a particular group, that group can determine how much water and how often and by whom it can be used. This right of ownership is recognized by all.

The matter is different when the well is put in by or in the name of the government. This well then belongs to all. Yet it has been the policy of both the colonial and the post-colonial governments since the 1950s to put in modern, high-yield wells. This is to open the range on a wider basis by providing predictable water sources for pastures formerly usable only in exceptional years. These wells have turned out to be the loci of innumerable conflicts, with fights over watering turns being common. Second, since any herd can use the well, the surrounding pasture is severely overgrazed. Bernus (1979) cites a case where Tuareg petitioned to have a government well turned off because of the lack of control and overgrazing in the immediate area, one that traditionally had been Tuareg prime dry season pasture. Also, it was felt that several

pump failures in the region were the result of sabotage by traditional users of the range to rid themselves of outsider herds. Our own brief visit indicated that, when you asked any given group of herders where they would like to see a well put in at government or project expense, they always indicated a location that was in the traditional range of another, usually different ethnic (Tuareg or Peul) group.

Yet, in spite of the fact that it is generally conceded that public-sponsored boreholes are a disaster, the projects in general, but the World Bank's in particular, envision putting in more--thirty in the Bank's project alone.

Putting in wells runs counter to any effective land tenure policy formation in several important respects. First, the question of why needs to be asked. Most studies report that traditional wells last only a dozen years to a couple of decades as opposed to the expected life of a carefully constructed well of fifty years or more. It is conventional wisdom that the longer something lasts, the better it is. But is this necessarily the case in an environmental niche as dynamic and changeable as this? Perhaps not. Twelve to twenty years may be convenient cycles for realigning the actual pastures used by various groups and for redefining the groups themselves.

This brings us to the second point. Traditional wells are not all that expensive to be beyond the scope of indigenous financing. Project papers and Sutter's work in the area (1978:28; 1980) indicate that the cost of a traditional well dug by Hausa "specialists" costs about the same as the selling price of a prime export bull. It would seem that projects would let spontaneous efforts solve part of the problem of herder association identification for them by seeing who gets together to finance a well. Also, as wells are within the capitalization capabilities of the local population, they will potentially be placed with a regard to the social reality of range usage and competition.

The African country that has done the most thinking in regard to the land tenure implications of well placement is Botswana. The point that Botswana material and experience underline is that local capitalization of wells stimulates land tenure formulation; government wells do not. What is important is to space the wells so that groups who finance them are establishing water rights to different ranges. The range can be used only within a restricted distance of a water point, depending on the species of animal, and, if wells are sufficiently far apart, well owners are controlling different pastures.

The World Bank project's proposal of assigning ultimate control and allocation rights to the pastoral associations that are to be identified from the existing social situation introduces another problem of effective land tenure policy formation. All of the populations in the Niger pastoral zone are followers, more or less strict, of Islam. It is in the area of well rights that Islamic law is most precise in terms of land tenure precedent. First, water cannot be owned. Water that is in the well has resulted ultimately from rain, which is a gift of God, and hence is owned by all. The mere digging of a hole in the ground does not give one an exclusivity; rather, it is the investment and manufactures that allow a person to raise the water that are owned and give allocation rights (Henri 1913; Bousquet 1950:232).

When a Tuareg or Peul group decides that the pasture around a given well that they own is being abused by other groups, they cannot deny them water to

force them to move on. Islamic law is very strict in this matter. If a well has water, it cannot be denied to any person who is in need of it. After human needs are met, then those of the animals must be met. In actual observation on the Niger range, we do not find that anyone is denied water; rather, they are denied access to water by taking down the apparatus for raising the water from a depth of up to 100 m. It is, then, the improvements made on the hole in the ground to reach water which is a gift of God that confer the allocation and other ownership rights to the group that put in the well.

Just what and how the project is to pass on to others exclusive rights to allocate water from a well and its pumping apparatus is not just a problem in range management but also one in Islamic jurisprudence. It would seem most prudent to heed those areas where there is the greatest potential for already well-defined principles of tenure rights in landed resources. The USAID project is the only one that makes systematic provision for a study that could determine their strength and extent. Herder association status would recognize and assist those collectivities of individuals that have rights in the main landed resource to have exchange value--access to well water. Research will be needed to see which other areas emerge as also having exchange value. Our idea of a block of land as a commodity may prove to be an idea that does not occur. It may, in our opinion, be just as likely that grass could emerge as a tenure issue. If we look at other tenure situations in Africa, we see that often, in neighboring Nigeria, it is not land at all but trees, or long-term cash crops, that become the defining tenure element in any local system (Elias 1951).

These Niger projects indicate the necessity of finding out which elements in landed resources have exchange value (in the local, ongoing system) for identifying the starting point for formulating a land tenure policy. Second, they indicate most clearly the power behind Barth's observation (1964) that pastoral economies do not exist in isolation. If we formulate projects for only one sector of what is really a multi-ethnic, multi-environmental niche economy, each with its own specialization, we are not only doomed to disappointment but to the very real possibility of doing more harm than good by upsetting very carefully balanced, but not overly rigid, mechanisms that allow an inherently dynamic and changeable desert-side economy to articulate with a nondesert one (Lovejoy and Baier 1976; Horowitz 1979).

CHAPTER IV

Cameroon

Effective land tenure policy will have to reflect this dynamic element and also the fact that policy will have to provide predictability and security for both cultivators and livestock-raisers. This would be particularly true in any political-economic situation ultimately controlled by sedentary populations. Key land tenure decisions would be made by nonpastoralists for pastoralists. What makes the projects in the Republic of the Cameroons different is that the highest political offices are held by people of pastoral tradition, and, as in Mauritania, the owners of livestock are still culturally dominant. Unlike Mauritania, however, Northern and Central Cameroon have relatively abundant rainfall (1,000 mm or more per annum) and possess unoccupied prime pastures awaiting tsetse-fly eradication.

In 1971 the Government of Cameroon began designing a livestock development project that would be feasible in terms of its actual technical resource base. It also established the parastatal SODEPA (Société de Développement et d'Exploitation des Productions Animales) to manage all such projects. Following a review of the proposed program, the World Bank in 1973 approved a 21-year loan of $11.6 million for livestock development in the Eastern, the Central Adamaoua Plateau, and the Northwestern Cameroons.

The World Bank's appraisal document sets out the six major components of this project (1973:10):

a) providing credit facilities and technical assistance to about 35 mixed farmers to carry out steer fattening, and to 115 settled graziers to develop breeding fattening ranches;

b) exterminating tsetse flies in about 800,000 ha to provide additional grazing areas and contain the southeastward advance of tsetse flies toward the fly-free grazing lands of central Cameroon;

c) establishing and operating three Government-owned 20,000-ha ranches;

d) constructing two slaughter plants, and modernizing 12 butcher shops in Douala and Yaoundé;

e) training ranch and slaughter plant managers, animal production extension officers, credit officers, and tsetse-fly extermination and survey teams;

f) preparing a second-stage project for livestock development that would include measures to ensure the effective use of areas cleared of tsetse flies, the expansion of credit facilities to the traditional sector, and the continuation of tsetse-fly extermination.

The mixed farmers to be reached by this project have an average holding of around 4 ha and derive their primary cash income from the sale of coffee. The appraisal team listed the average holding to have 0.25 ha of land in coffee, 0.75 ha in subsistence crops, and approximately 3 ha which could be

devoted to fodder production and steer fattening. The project design calls for these farmers to receive credit for buying three steers a year for growing out and market activity. It was also expected that the animals would contribute to diversifying agricultural activities, soil development through manure application, and new farming techniques. These farmers continued to rely on the traditional land tenure system where holdings remained in usufruct as long as they were in production.

The main thrust of the project was, however, to create a group of private graziers who would lease range from SODEPA for a nominal fee. These private ranches were to be from 100 ha to 750 ha in size and were to be established in the Northwest and in the Adamaoua Plateau. Participants had to have resided in the area for at least five years and had to have a good standing both in the community and with local credit organizations. It was hoped that by this means the most progressive graziers would be attracted. In addition, the project hoped to count among its participants the more progressive of the traditional leaders in the area.

The amount of land a herding family could rent was dependent on the number of cattle in its herd. A family with 50-60 head was to receive something in the neighborhood of 250 ha, while a family with 300 head got 750 ha. Once a family qualified, SODEPA would secure a 20-year lease from the government and then enter into a sublease arrangement with the participant. In exchange for the exclusive usufruct entitled by the sublease, the herder would agree to follow all the technical instructions of SODEPA and pay all debts for range improvement, stock, etc., promptly. The participant also had to pay the cost of having his land surveyed. Noncompliance could result in eviction, but the project made a provision for compensation for all expenses incurred and paid by the participant up to that time. If the program proved successful, the subleases could be renewed after the original 20 years had expired.

As was mentioned above, the primary focus of the project was to develop private graziers. It also hoped to provide a stimulus for increasing sedentarization. Given the nature of the participant requirements, it would appear that only sedentary Peul could hope to join in the scheme. In Cameroon, the nomadic pastoralists belong to the Bororo branch of the Peul and would be unlikely to be attracted to such a project in the first place, and would not have resided in the area for any great length of time anyway.

In order to enhance the productivity of those who did participate, the project called for three 20,000-ha ranches to serve as breeding and demonstration centers. These ranches were to be placed in unsettled and lightly grazed areas and would be fenced only where it was necessary to prevent nomadic herds from entering and mixing with the SODEPA cattle. The residual rights of the Bororo who used the area were not explored in the project documents, and the extent of their utilization of these ranges is unknown.

By far the most ambitious undertaking of the project was its tsetse-fly eradication. Once the fly was removed from the proposed 800,000 ha and the neighboring pastures made safe, approximately 1.3 million ha would be open to grazing. In preparation for the demand to be placed on these new ranges, the government established, under the authority of a Presidential Decree, a Land Allocation Committee composed of governmental officials, traditional leaders,

and local herd owners. The committee established three levels of priority. The first category was herders who had most recently been forced out of the eradication zone by the spraying operation. Second included those graziers who had left due to the southward expansion of the fly, but who still paid taxes in the eradication zone. Last were those people who had residual claims because they had herded there in the past.

The success of the whole operation depends on how successful the project will be in keeping the tsetse at bay. There is the possibility of reinfection, which had undone a previous attempt at eradication. Also there is the possibility of strains developing an immunity to the insecticides used.

This was the only West African project document to consistently point out major land tenure policy issues. The issues were not analyzed, but left to the host government to solve. Cameroon's land tenure law of 1960 restored all traditional boundaries. At the time of project implementation, there were actually two different land tenure laws for the range. In the Western Cameroons (former British colony), herders needed a permit before they could use the range. Also, if a cultivator wanted to plant on land normally used for pasture, he also had to secure a permit. Freehold was impossible, and the permit was for a limited time only; it did not give a grazier exclusive rights, as many herders would have permits for the same range.

In Eastern Cameroon no permit was required, but freehold was possible. Therefore, SODEPA was able to secure freehold for its two ranches in the east and central regions but only a 99-year lease in the west. The permit idea seems like a good one on the surface, but the World Bank's appraisal team found that it led herders to try to maximize the time they had access to a particular range, and hence it led to abuse. The project hoped that more secure, permanent rights of exclusive use would lead to greater receptivity to modern herding practices. The World Bank's appraisal team estimated that, with proper techniques, not only could live weights be substantially increased (more meat from the existing national herd), but also carrying capacity could be raised as high as 1 UBT to 1.5-2.0 ha in the northwest (more animals on the same range).

The project leaves several areas unexplored that would have consequences for its overall effectiveness. The types of tenure to be given to the graziers who moved into the eradication zones is never made clear. From personal observations in the Cameroons, it would seem highly unlikely that, once the area was free of tsetse, any effective way could be found to keep nomadic Bororo herders out.

Herders in this region have an abundance of rain when compared with pastoral populations we have examined previously. With an annual rainfall of over 1,000 mm, ranching is possible, but then so is nomadic movement. The project never spells out what the herder gets by choosing to participate except the chance to go into debt in order to have a sublease that can be terminated at will by the SODEPA. Both the participant and the nonparticipant have relatively the same freedom from abject want; the nomad also has freedom from arbitrary interference (v. Parsons 1954:23).

This is the same type of problem faced by a USAID project just being implemented in the region to the north of the Adamaoua Plateau. Initially

conceived of as a $8.3 million effort, the agreements were signed in 1978. The project team did not assemble until 1980, and the initial research called for in the project paper was just beginning in the fall of that year. The project is imaginatively conceived and well thought out. The original USAID design teams rightly recognized that the problems of the northern region were larger than those of just herders or sedentary cultivators. The project therefore calls for an integration of the region's livestock production and cultivation, while halting and reversing environmental deterioration.

Northern Cameroon

In the area selected for a pilot or demonstration effort it is estimated that as much as 80 percent of the land had been cropped at one time or another (Project Paper 1980:41). This is to be anticipated in an area of an expected annual rainfall in the neighborhood of 1,000 mm. Cultivation has exacerbated the range condition by the systematic elimination of grass species by plowing and weeding down the cultivation cycle and by making the land more susceptible to wind and water erosion. Although much is made in the literature of the symbiosis between pastoralists and cultivators in the use of fallow for pasture, it does not always provide good grazing.

With the level of rainfall as high as it is, it does make cultivation a real alternative. The dominance historically of livestock management in the region is due to political factors. Even the most superficial survey of Northern Cameroon makes abundantly clear that demographic growth among cultivators is much higher than among pastoralists (Podlewski 1961) and that land pressure will be a factor in any livestock project. The project aims to meet these realities head on by increasing the carrying capacity of an already overtaxed range and stimulating farmers to grow fodder crops. The project sees water point development, seeding, and range management as the key ingredients.

The project plans to introduce certain "proven" livestock management practices (ibid.:2). Just where these have been proved is not spelled out, but they include rotational grazing, rest rotational grazing, and uniform grazing (ibid.:8). Each of these techniques will be modified to adapt it to the Northern Cameroon situation. All of this is contingent on the establishment of local-level organization for disciplined livestock resource management. The traditional land use systems and tenure rights are to form the basis for this transformation. Individual rights to range are felt by the project designers to be more developed in Cameroon than elsewhere in West Africa. As they point out (ibid.:13), there are indigenous forms of renting range, etc. A form of range management is in place that is hierarchically organized through the traditional Peul (Fulbe) offices of Lamido, Lawanas, Sarku Sanu, that together form the basis of pasture use, rights, and transfers. The project hopes to marry this traditional system with modern herding theory through the development of local committees that will include these traditional officeholders.

There are several different kinds of people who will be affected by such a process, and each of them has had a different historical experience with this traditional Fulbe power structure. First, there are the sedentary non-Fulbe who have within not-too-distant memory been subject to conquest, enfeudation, and enslavement by Fulbe cattle keepers (v. Campbell and Riddell 1981). There is still considerable hostility just below the surface of everyday life that

is quickly revealed in even superficial farm-site interviews (Riddell 1980). These non-Fulbe populations have one of the highest birth rates in tropical Africa (Podlewski:1961), and their constant movement into rangeland is, in all probability, an unstoppable process.

Next there are the sedentary Fulbe who have herds that are managed by hired shepherds and who have relatively extensive cultivation around their homesteads. Because the cattle are corralled at night and are moved from field to field on a seasonal basis, their farming system is the most productive in terms of yields per hectare and represents the most efficient means of mixed farming in the area. These sedentary cattle managers are in conflict with the two remaining major groups in the area, both Fulbe-speaking. These two groups are at opposite ends of the political spectrum. One of them is composed of the Bororo, fully nomadic pastoralists who move their herds from Northern Cameroon to Nigeria, Chad, or Niger, depending on conditions, market considerations, or national policy changes.

There is a certain amount of ambivalence surrounding the Bororo. On the one hand, they represent the romantic ideal from which all Fulbe in the Northern Cameroon trace their ancestry. On the other hand, they are not constrained by local rules; their practice of Islam is suspect; and, as exceptionally good animal managers, they always seem to show up where resources are best. They are therefore formidable competitors when range resources are scarcest. The mixed-farming Fulbe herd manager all too often finds that, when he moves his animals between rainy and dry season pastures, he has been preceded by Bororo herds. Also, Bororo sales affect the market price, and yet they are soon gone while not assuming any of the responsibility in the dynamic sociopolitical affairs of the region.

At the other end of the sociopolitical spectrum are the large town-dwelling Fulbe herd owners. In many ways these people will represent a greater problem to project implementation than the more spectacular, from a range management point of view, Bororo. In contrast to the Bororo, who will be discussed by almost all segments of society, Fulbe and non-Fulbe alike, the powerful town-dwelling Fulbe herd owner is, in our experience, never openly discussed. This is a common phenomenon all across Africa. The largest herd owners have tremendous prestige and power in many sectors (in this sense, Herskovits' outstated but influential 1926 contention that African livestock owners invariably select for numbers not quality for cultural resources, is still correct)--political, religious, social, as well as economic.

This raises a certain problem with our usual paradigm. When we interview the Bororo we come away with the impression of a great shared egalitarian ideology (v. Riesman 1977; Lefebure 1979). This impression is often reinforced on a visit to the range, where we see numerous herds of between 50 and 150 UBT managed by each family. It is only when we try to change the system that it becomes important to find out whether or not the supposed equality of herd size on the range is the product of economic opportunity or an artifact of a management system where the herder walks with the animals in his care. That is, it is very important to find out the types of rights that the herder has in each of his animals. In pedestrian herd management, a person is able to control only so many animals, and, for a family group, 100-150 appears to be the normal limit in Africa. The large beef herds of the American West represent an

entirely different management problem in comparison to the herds on the range of Africa that must sustain the family on their by-products. Labor is needed for milking, cheese-making, smallstock care, etc., as well as for pasturing responsibilities.

Therefore, when an individual builds up a sizable herd, he will distribute many, if not most, of his animals to others through various kinds of loan, prestation, gift, and service arrangements. It was our impression during our interviews in the project area during 1980 that a majority of the stock on the range was owned by a small number of very powerful townand city-dwelling elite Fulbe.

The tenure issue becomes one of how we enhance the role of the more efficient mixed-farming herd owners when the resources, political and economic, are controlled by large absentee herd owners. Since the animals represent, to these large herd owners, social, political, as well as economic alliances, the actual efficiency of the operation is not overly critical. If the animals die, the relationship between lender and lendee still holds and is still politically efficacious. That is, the small mixed-farming herd owner has everything to gain from range improvement, while the large absentee herd owner has relatively little to gain. Yet it is the latter through whom we will have to work if we have any hope of succeeding in changing the kinds of rights producers have over range and range resources. In tenure terms, at least, this is a much bigger problem than that posed by the nomadic Bororo.

In conclusion, there will be several major tenure problems to be worked out in the proposed pilot project. The first will be the necessity of finding some kind of effective policy regarding the continual movement of cultivators (Fulbe as well as non-Fulbe) onto areas legally declared as range. Resort to legal codes is of little avail in this matter. We spent a week in the spring of 1980 in an area where there was an attempt to enforce the cultivator-herder boundary. Fulbe herds were turned loose on sorghum, etc., fields, while the hapless and helpless farmers looked on abjectly. Even though feelings were running high, we were able to interview, both individually and en masse, about a hundred of the affected households heads. Most had been through this sort of thing before, and they planned to try the following year to put their now-destroyed farms back in operation. Even the Fulbe herders with whom we talked seemed resigned to the eventual conquest of demographic pressure over legal codes.

The second major tenure issue is the nature of range rights for mixed farmers. The above legal codes do not apply to Fulbe mixed farmers, only to non-Fulbe. On one side of a seasonal water course (Mayo) will be dispersed hamlets of non-Fulbe, with their domestic animals penned during the growing season, while on the other side will be the large homesteads of Fulbe cultivators, who have their herds out on the range for the day. It was our impression that tenure and development efforts should try to encourage mixed farming along lines that enhance soil fertility. Opening up the range to all will not do this, as it will reduce the amount of fertilizer available for already overtaxed poor soils; and yet, it seems inherently wrong to restrict access to range resources along ethnic lines. We need to look for tenure rules that will reward those producers of livestock who manage the range and other resources best.

The final tenure issue we have touched on is the question of who owns how many of the animals actually using the pilot zone and the project area. As has been pointed out by so many observers of the African pastoral scene, the animals in a family herd represent more than a collection of commodities. An animal can also have a number of different residual claims and relationships, symbolically represented by this particular cow, bull, etc. A cow is at the same time a commodity; a process owned by the herding family (milk, and other by-products); and an encumbered good that may have to be returned to a lender, is promised in a future relationship (marriage, etc.), or in some other way represents a future opportunity value. If some large proportion of the animals is tied in one or more ways to the future opportunity options of a few powerful absentee herd owners (as we suspect is the case), we must be on double guard against the possibility that the project rules end up resulting in enclosure.

CHAPTER V

Mali

Mali, after Nigeria, is West Africa's leading producer of meat. Even though it is a Sahelian country, it has a higher productivity than its neighbors due to the large interior delta of the Niger River and its branches. The annual floods provide predictably good dry season pasturage. The delta floods from the waters coming from the Guinea highlands in August through October. Herds leave the delta as the rainy season approaches, using the Sudano-Sahelian pastures replenished by the new rains from July to October. As the surface water dries up, the herds move back to the interior delta where, from November to May, excellent pastures are progressively uncovered (v. Gallais 1967).

Until 1970, the exportation of beef, both chilled and on-the-hoof, accounted for more than 50 percent of Mali's exports. Ghana was the major importer until its economy collapsed in the 1960s. Since then, the Ivory Coast has accounted for 85 percent of exports (Staatz 1979; Stryker 1974). The drought of 1969-74 saw a dramatic shift in the central government's livestock policy. With the loss of an estimated 30 percent of the national herd due to the drought itself or through forced sales, the government tried to stimulate more internal marketing to meet the country's internal demand, especially by the urban population. Secondly, with the severe food shortfalls during the drought, grain production became the paramount focus of development activity.

Export taxes were imposed, cattle head taxes were initiated, and prices were frozen at 1970 levels. The general shortfall in meat supplies in the Ivory Coast drove prices up, and it made more sense for pastoralists to sell their animals there rather than within Mali, where the support prices were not reflective of real costs or demand. In order to rebuild the herds and to forestall political deterioration in the urban centers as the real purchasing power of local salaries (mostly government-related) began to fall, the government in 1975 closed its borders to animal exports (DuBois 1975; Glauber 1980). The Ivory Coast turned to the world market and bought frozen beef largely from Argentina and the EEC (Staatz 1979).

Throughout this crisis the Malian government was in no position to invest in rural development, especially in the pastoral sector which received less than 1 percent of the national budget. Instead, the government concentrated on paying civil servant salaries, for obvious political reasons, and it largely left the problems associated with the country's external debt to France and its rural development to international agencies. Many donors responded in the livestock sector, but by far the largest were USAID and the World Bank (IBRD).

IBRD identified its project focus in 1970 and developed it through a series of studies done by SEDES and IEMVT, which were paid for by FAC. The IBRD appraisal team recommended the project in 1974, and it was initiated in 1975. The project, at a total cost of $17.5 million, was desired to help the herders of the interior delta rebuild their herds through:

a) introducing livestock extension services and grazing control in three special development areas;

b) providing improved animal health services throughout the Fifth Region;

c) constructing 70 wells and 50 ponds;

d) constructing and managing an abattoir and hide-drying facilities at Mopti-Sevare;

e) constructing and managing 5 livestock markets;

f) establishing and managing a 150-ha livestock and pasture trial station;

g) providing personnel training and testing a functional literacy program for pastoralists; and

h) preparing a second-phase livestock project (Project Appraisal Document 1974).

USAID responded to Mali's request for help in its livestock sector with three projects and a cadre of experts, at an estimated total cost in excess of $50 million. These three projects were designed to provide assistance in all major aspects of the livestock sector, from initial production problems to marketing. The first project, Mali Livestock Development, identified pilot farmers who would be provided credit for animal purchase. The project then initiated controlled grazing and developed feedlots. The second project, Mali Livestock Sector, was designed to introduce range management for 800,000 acres and 100 new water points. In addition, it would attempt tsetse-fly control and vaccine to open new pasturages for more intensive use. It also envisioned a livestock-fattening component.

The third USAID project is designated Mali Livestock Sector II and hopes to put 1 million acres under controlled range management with the development of 200 additional water points. Again, tsetse-fly eradication is important, as is animal health. The animal owners are to be organized into associations, and the hope is to combine controlled grazing with fodder production, etc. This latter would be essential for a dry season feedlot.

That all four of these projects have run into major difficulties in implementation is to be expected. Mali has all of the difficulties we have discussed for other West African countries. Cattle management is multi-ethnic, with the Peul (Fulbe), Tuareg, and Maure the dominant pastoral populations, but the sedentary farmers also comprise, en masse, a very large animal-owning group, with a fair proportion of the national herd. The herds of these sedentary populations cause a major point of friction in the overall range management of Mali. While the main herds are away at rainy season pastures, the local herds are eating the grasses that will have to sustain the total herd in the coming dry season. When the transhumant herds return, they find not only that the home pastures are depleted, but that the water holes are not replenished and are dirty and disease-ridden.

Also, as Mali emphasizes the development of grain production, we have the same situation of using the Niger River more effectively that we have with the Senegal River. More and more land is being taken out of pasture and put into irrigated rice. This land is therefore claimed by different ethnic groups

(farmers, herders, and fishermen), practicing differing economic specializations with competing residual rights.

Land tenure problems have emerged as paramount in each of these attempts. Yet Mali is one of the few countries in Africa with a well-developed, traditional, range-management land-tenure system. We have seen above that both the Maure and the Tuareg had pasture-control systems based on ownership of wells and general territorial claims based on contest of arms, treaty, and tribute. This situation was volatile, however; it worked until colonial intervention. In this sense, all systems that survive are successful, but the Malian data present us with an indigenous planned effort that took shape over two centuries.

In the fourteenth century, Peul (Fulbe) herders began entering the Niger River delta area in ever greater numbers. They were expanding out of the Toucouleur-controlled state of Tekrur. At this time, they most likely were coming in small family groups in a fashion that would represent our classic model of a nomadic pastoral society. This would conform to the somewhat idealized picture we have of the Peul from the work of Dupire, Stenning, and Hopen. However, as a USAID social anthropologist, Lewis, points out in a seminar paper, the Peul have always been associated in some fashion with state organization (Lewis 1978:3). In the seventeenth century, they conquered the delta, establishing a semi-autonomous state, Macina, which now forms the administrative Fifth Region of Mali. Conquered villages and villages of captives, the Rimaibe, became part of a general economy dominated by Peul values.

As natural as the interior delta region is for transhumance, it is also conflict prone. Herds can compete with each other at fords when moving out of the delta at the beginning of the rainy season. There can be competition for pastures, water, and transhumance routes. It is the return trip, however, that is more likely to produce potentially strife-ridden situations. The herds must leave the northern pastures before the water holes to the south dry up. This puts many herds on the periphery of the delta at the same time. The herds must wait in the peripheral zone until the pastures in the delta itself have dried out sufficiently to sustain large numbers of animals, without turning it into a morass or trampling all the grass into the soft earth. To be most effective, the herds should wait until the grasses are maturing before they cross. Crowding and conflict can potentially take place at each ford.

Once the herds enter the delta they must confine themselves to the higher pastures and follow the receding water throughout the dry season. The rate at which pastures become available and the ranges which are best can change from year to year, depending on the level of flooding. This again became an area of competition and dispute as the number of herds and animals increased.

By the nineteenth century, the conflict over pasture rights had reached a level severe enough that Cheikou Ahmadou, after establishing a hegemony over the Peul of Macina, began to institute a land reform for herding rights. This code of herding rights and schedules of herd movement is the Dina. In the Dina, Cheikou Ahmadou established four types of pasturage that would constitute a group's range (leydi) (Gallais 1967). The best dry season pasturage for the animals of the whole group was the bourgou. Other outsider herds were permitted to graze on a group's bourgou for a variety of reasons, but most common

would be that one group's range was better than another's in the early dry season, and the two would reciprocate grazing rights later on. Such access is usually accompanied by a payment of some sort. This has changed over the years, but most herders will keep a few extra male animals in a family herd just for this purpose (Lewis 1978).

Cheikou Ahmadou also allotted each group a pasture for the milk herd that stayed behind during the transhumance to the rainy season pasturage. This was the harrima. Since this herd was expected to deteriorate by being left behind in contact with the diseases borne by the insects that accompanied the rains and the flooding, the main milk herd had to be moved further away. Therefore, each group had a pasturage, called benti, which was for short transhumance compared to that taken by the main herd.

Finally, the main herd (garti) made its movements out of and back to the delta in relation to all other herds that would use the same ford and same transhumance route (burtol) as itself. The Dina defined the departure date and the sequence for each moving group (egguirgol). Herds now left the delta and returned in a sequence that would take them back to their bourgou (main pasture) in conformity with the relative date of their pasture being ready, the route they would take on the delta (gumpel), and the relationships between the group leaders (dioro).

Cheikou Ahmadou undertook this reorganization of herding regimes for two basic reasons. The first was to stem the rising level of conflict, and the second was to strengthen Islam (Daget and Ba 1955). In this latter category, it was an effort to settle the herding populations and to change nomads into seasonally migrating populations with a home village (ouro). Land was divided between the various Peul herding groups, and, in addition, several Maraboutic (religious) Peul groups were introduced and given their own range.

The system probably never did work with the precision it appears to have in Daget and Ba's description. Minor or even major adjustments would have to be made each year between the various groups, depending on rainfall, flood levels, or drought. Even so, it provides the model of the operating rules for cattle movement in the delta today. The paper by Lewis describes the current definitions of the system for the Jafaraabe egguirgol.

It would appear on the surface that any project, in order to succeed, would have to work within this system. While this is certainly true, there are some difficulties that must be faced. First, the Dina has been responding to a series of pressures at least since the beginning of the French colonial intervention. Initially, the French agreed to sustain the Dina (Convention no. 88, 1904). The establishment of French suzerainty, however, also had the effect of opening the delta to new groups. Over the intervening years, Tuareg, Bella, and Maure have been bringing in their herds. Conflicts between the Peul groups have continued, especially between the aristocrats, who were descendants of the original founders, and those of the Maraboutic groups installed by Cheikou Ahmadou. As the conflicts grew in severity, intervention became more necessary. Table 6 gives the dates of the major administrative interventions.

Besides the conflicts that occurred between the various established herding groups in the delta, there were the pressures associated with the droughts

of 1913-14 and 1969-74. Both of these brought new herds into the delta at a critical time. More animals led to environmental deterioration. Additional pressures have been placed on the livestock sector and indirectly on the effectiveness of the Dina.

Colonial policy promoted meat production as part of an economic package that saw the establishment of private ranches. Then, during World War II, meat was extracted for the war effort. Meat was also needed for the growing Office

TABLE 6

Dates of Major Administrative Interactions in Dina

DATE	ACTION	CAUSE
1904	Convention no. 88	establish peace
1919	Arrété	permits for outsiders (1913-14 drought)
1931	Circulaire 38	stop fighting
1944	Convention de Mopti	stop fighting
1955	Décret foncier et dominal	cultivator rights
1961 and annually thereafter	Conférence des Bourgoutières	current difficulties
1969	Ordre de préséance	herding rights
1971	Ordre de progression d'accès	change of entry dates

du Niger irrigation project after the war. The expansion of cultivation by the Office du Niger and its colonization schemes (Dumont 1965) initiated the process of gradualing reducing the amount of pasturage available, often in the best dry season range (Table 7).

Since the creation of the Office du Niger there have been additional development efforts, each of which demands new uses made of existing pasture. These are Opération Mil for sorghum, Opération Riz for rice, and Opération Pêche for fishing, in addition to ODEM for increasing livestock production.

In the 1950s Marcel Drahon installed an effective animal vaccination service (Gallais and Boudet 1980), which helped augment an already rapidly growing herd. By the 1960s the herd had grown to four or five times the size it had been when the Dina was created (ibid.)

TABLE 7

Land Use Change in the Interior Delta

LAND USE	1952	1975	% CHANGE
Cultivation and fallow	284,300 ha	446,200 ha	+157
Degraded pasture	190,400	1,206,900 ha	+634
Pasture	4,135,300 ha	1,946,900 ha	-212

SOURCE: J. Gallais and G. Boudet, Projet de code pastoral concernant plus spécialement la région du delta central du Niger au Mali (Maison-Alfort: IEMVT, 1980).

The Dina was designed for a relatively homogeneous Peul group holding all the power. This is no longer the case. The Peul-proper make up only about 20 percent of the population of the interior, which is their stronghold. In the Seno region to the south, 64 percent of the Peul families have cattle, but then so do 39 percent of the Dogon cultivator families.

In summarizing the difficulties faced by development agencies with the Dina, Gallais and Boudet cite the lack of any juridical or institutional legal machinery for handling problems when they arise. When conflicts occur, there is no set policy; rather, problems are handled on an ad hoc basis, and there is no precedent from one situation to the next. There is a need for a code to provide predictability. Secondly, Gallais and Boudet say that there is a lack of a clear hierarchy of management for using the range, and there is need for a formal structure of articulation between the government and local leaders. Finally, they cite the lack of any mechanism for including the herders themselves in managing the existing or future pastoral codes.

Gallais and Boudet go beyond criticism, however, and elaborate a modernization of the Dina which they call a pastoral code. Their suggested code is divided into three major parts: organization of communities of herders; territorial organization; and pasture management. Almost every project discussed in this survey of tenure problems in livestock development cites the creation of new assemblies of herders that will manage the enhanced resources.

Gallais and Boudet attempt to set forth the policy mechanism that will result in local as well as regional and national areas of initiative. Article 1 of their proposed code establishes a hierarchy of responsibility within the interior delta (Fifth Region). This allows a coordination of the changes taking place in cultivation (especially rice), fishing, and herding, and indicates who is responsible at each level. The second article then sets out to define the

nature of the pastoral and agro-pastoral communities. These units are recognized on the basis of existing operational uses of land, exchanges of services, etc. It recognizes in policy formation that these communities will be multi-sectoral and will involve herders, cultivators with animals, and fishermen, all using the same territory in overlapping time-space frames. The basic policy unit, therefore, is an ongoing resource management unit.

Article 3 recognizes the fact that each of these multi-sectoral units will have to have administrative and policy-making flexibility vis-à-vis the national bureaucratic structure. Therefore, this article establishes that each community (in the sense outlined in Article 2) will have a council that reports directly to the commandant de cercle. The situation is recognized as dynamic, and the communities as initially defined may change. The policy for accomplishing this is set out in Article 4, where responsibility is placed on the councils themselves to initiate any redefinition, which must be affirmed by the governor of the region.

One of the problems facing all attempts to create herder associations is the allocation of any power of enforcement. While action is expected of the newly constituted social collectivities created by a project, the juridical functions are vested elsewhere. Herders are expected to give up some rights in a range they have been using in order to reap the benefits of project improvements, while allowing juridical functions to pass from their local control to some higher level. It is small wonder that such newly created units seldom survive the project.

Gallais and Boudet propose that these juridical functions be vested in the communities (as constituted in Article 2) themselves. This is set out in Article 5, where the community council is expected to assume the responsibility of imposing local taxes, financing their own budget, establishing markets, hiring their own agents, creating their own production, founding buying and marketing cooperatives, and establishing the fines and rules of enforcement of pasture usage. The national governmental hierarchy need concern itself only with application of national law rather than taxing already thin local administrative personnel for decision-making about things that are better understood by the local population.

One of the strengths of the Dina was that it coordinated movement and pasture use rights throughout the interior delta. This strength is preserved in the proposed pastoral code through the mechanism of each community council sending a representative to form a regional council. This body would be the level at which any adjudication would take place in the transhumance routes. This unit would replace and serve the function of the now-existing Conférence des Bourgoutières. Finally, in Article 7 there is the provision for the establishment of a commission of arbitration to resolve those problems that do not fit within the defined policy precedents.

These first seven articles define the nature of the responsibility units, the scope of their powers, judicial as well as managerial, and their relation to the national administration. The next eight articles concern themselves with matters of territorial organization. For example, Article 8 establishes the definition of rights of usage and responsibility of management in general. Article 9 does this for the lands of the communities established in Article 2.

Article 10 does the same for those landed resources that are utilized by more than one community. These would include but not be limited to wells, salt cures, recession areas, etc. Article 11 defines the nature of the use rights and responsibilities associated with national domain--for example, public range, water ways, national parks, and so forth.

Article 12 recognizes that traditionally there have been social groups that have had restricted access to resources, such as conquered groups of cultivators. This article states that all social levels have equal use rights to a community's resources. Any conflict between members of a community are to be resolved at the level of the council. Also left at the local level is the power to determine the length of use rights and their suspension (Article 13). The next two articles (14 and 15) cover the types of land contained within a community and the use of a community's soils. Again, control and decisions are vested in the local level.

The last seven articles concern pasture management. Article 16 sets forth that it is the local council's responsibility to establish the annual carrying capacity. This leaves the local level responsible for its decisions. If it makes bad or uninformed decisions, the situation can be rectified in the next year. The point is that the people using a particular pasture have the responsibility of drawing up use plans establishing carrying capacity and the juridical power to back them up. They also have (Article 17) the responsibility of seeing to the marketing of local animals. Since the local area has control over proceeds and budget, it is to their advantage to fulfill the article's mandate that this marketing be done officially and be properly codified.

We have mentioned before the problems in the Sahel associated with range fire. It is necessary, but it must be done at the proper time. By placing control over this aspect of pasture management with the local council, any contravention can be handled quickly and efficiently. Also, this article recognizes the flexibility needed, given micro-environmental niches that will differ from one pasture to another.

Articles 19, 20, and 21 establish the responsibility of setting aside some pastures for recovery, preservation of woody plants, and periodicity of exploitation. Finally, Article 22 puts the local policing agencies at the disposal of the local councils to enforce management decisions.

We have spent more time on this important document because it should serve as a model for the kinds of factors that must be considered when forming herding associations with their attendant tenure rights and responsibilities. In addition, the authors recognize the necessity of a very thorough knowledge of the historical, social, and ecological framework in which tenure rules operate. Also, the Project for a Pastoral Code is in agreement with the guiding principles set forth in USAID's Workshop on Pastoralism and African Livestock Development (v. esp. 1979:6, 7, 10, and 11) and hence represents a building on experience and not a break with our current efforts.

This project, if implemented in a pilot zone as intended, will have to face a number of additional problems not addressed in this otherwise detailed work. Given the real nature of control in the Malian livestock sector, there will be a very real problem of how to reduce the concentrations of power and

prime landholdings that are currently in the hands of a few individual families. Also, an important issue not addressed is what the criteria will be for deciding who gets excluded from the delta in years when climate, etc., cause a reduction in the established carrying capacity. Although most of the power is slated to rest at the local council level, this issue involves national citizenship. Can Mali realistically expect some of its people to forego use of one of the country's major refuge areas in times of drought? In this case, a contingency plan will surely have to be drawn up at the national level. Finally, what is the ultimate persuasive or coercive mechanism (beyond local police), particularly in critical initial phases of realigning boundaries and social groupings when resistance occurs?

CHAPTER VI

Conclusions

Each of the projects discussed in the foregoing analysis has thrown into relief various problems associated with the kinds of tenure rules and decisions that are involved in arriving at an effective policy for using landed resources in new ways. The Mauritania material demonstrated how easily a well-thought-out livestock project can be eliminated by drought. Yet drought is a common occurrence in this part of the world, and any long-term improvement in the livestock sector's contribution to the continent's food supply will have to include it as an important factor. Another way of looking at the situation is that, because of climatic variability, drought to some degree is occurring each year at some spot in a national range. This dynamic quality, introduced by vagaries of rainfall, etc., in the environment will have to be reflected in any land tenure system that hopes to make sense to the herders themselves.

The Eastern Senegal projects pointed up another factor: the need for good detailed sociocultural studies coordinated with project design. The technical paradigm associated with carrying capacity, offtake rates, species of grass and their reseeding potential, and so forth, is relatively independent of which group is actually using the range. In the area of land tenure this is not true. In this case we have villagers who need to find some mechanism for managing a common pasture. Also, given the poor soil base upon which these cultivators have decided to found their villages, it would behoove us to think in terms of ways in which animal-raising and tenure arrangements could be combined to help build soil fertility. Finally, the fact that these villages have been settled on the transhumance routes of large herds which pass through the area twice each year raises the issue of what kind of recognition we need to give to residual rights resulting from an awareness on the part of all that the herds clearly predate the villages.

The projects in Senegal's Ferlo region underline for us several other problems common to most livestock development efforts. As was hopefully made clear in the discussion, people have been settling around wells since the 1950s. Yet, when the recent drought came, they quickly assumed the former long-distance transhumance. This is a factor of critical importance for developing any effective land tenure policy. If groups do agree to all the rules of range rotation and exclusivity of use demanded by the project, what happens to those reciprocal relationships that provide access to another range in case of drought? As was mentioned above for Mauritania, drought is always present to some degree, and someone will need to escape from its effects in any normal herding season somewhere in the Ferlo.

Herders are asked to give up mobility in exchange for access to water. This is not the same thing as giving up residual rights to access to particular pastures that have been used for generations as part of the transhumant pattern of a given family or lineage. If we were to maintain that these residual rights are extinguished by the project, then we must wonder just what the exchange is that would make it sensible for the participants to agree to this interpretation. Rather than viewing residual rights as a nuisance to be written out of existence through the use of appropriate legal machinery, residual rights should form the basis of a land tenure policy that recognizes the nature

of the resource base and the territorial extent of economic and resource management relationships.

The Niger projects emphasize the fact that pastoral economies do not and cannot exist in isolation in a Saharo-Sahelian environment. There just is not enough room to put all the animals needed to keep the present nomadic populations alive on a pure animal by-products basis (v. Dahl and Hjort 1976). Since we are dealing with a single economic system that is made up of ethnic specialization in more than one environmental niche, our land tenure policy will have to reflect this if we hope to have project participants use their landed resources in more productive ways. This may mean that we need to think in terms of a different policy component for each ethnic group and each niche. This, unfortunately, flies in the face of the trend to establish unified legal codes on the part of African nations.

It is common in almost all livestock projects designed in the last decade to speak of herder associations as the basic social unit--to be created out of the existing traditional social structure--to engage in the new behaviors proposed by the project in order to improve livelihood on some part of an existing range to which each herder already has use rights. Despite the contorted nature of the above sentence, it points out the dilemma faced by a project: On what basis is one to form a herder association? Even after more than a decade of efforts, we know of no successful case where these units have been created and have taken over range control on a sustained basis. There are multiple reasons for this failure, and one of them is related to the nature of the land tenure systems in operation on the traditional range. As was pointed out in discussing the Niger material, there is no way the government will tolerate reestablishing the traditional Tuareg form of pasture control and management with its domination and subjugation of others.

The most common approach by development personnel is to appeal to the herders' perception of a deteriorating range in order to get them to see that it is in their long-term interest to reverse such processes through more controlled usage. While most herders we personally have had the chance to interview lament the condition of the pastures upon which they graze their animals, they see it as the result of too little rain, a government well attracting too many outsiders, and other factors that are beyond their control whether or not they are organized into herder associations. We are trying to create units to allocate resources that have no exchange value in the existing social context. The herders rightly realize the impossibility of enforcing on their own any such land tenure rules. What can they withhold if the other party will not abide by the new rules? Nothing. We must, then, form our land tenure policy around those resources like water that have an exchange value in the existing economic system.

Many of the problems that projects encounter from a land allocation and/or tenure perspective are associated with the fact that the governmental officials have no real experience with livestock management. This is where the Cameroon data accentuate the problem of demography. In spite of the fact that senior government officials come from Northern Cameroon and from Peul backgrounds, they are powerless to halt the continued movement of cultivators onto prime rangeland. The Cameroonian land tenure law of 1960 confirms the traditional boundaries of pastoral and cultivator groups alike. Yet, in observing attempts

to enforce the herders' rights to an area, rights that are recognized also by the invading cultivators, one realizes that such efforts are for naught. No sooner is one cultivator removed than another moves in a kilometer or less away. The invasion is effective because it is so diffuse and unorganized. This is, of course, happening all across arid Africa.

Historical demography should convince us of the futility of drawing a line on a map and declaring that, on one side of the line, we will have a land tenure system for cultivators, and on the other side, for herders, even if the Cameroonian material were not so graphic. This is an idea that repeatedly has been proved ineffective. This error in land tenure policy thinking stems from several misconstructions of the situation. As was pointed out in the discussion of the Niger materials, pastoralists do not occur in isolation. All along the fringe of the pastoral zone, herders are cultivating, and neighboring cultivators, a kilometer away on the other side of the line, are raising livestock. Therefore, any tenure arrangement that makes cultivation and pastoralism incompatible is bound to be ignored in practice.

The Cameroonian data also clearly underscore another factor that is generally true of African pastoralists, and that is the vast difference in wealth among herders. Our conventional model sees, in pastoral society, egalitarian structures and the existing social situations as deviations to a greater or lesser degree from this ideal type (Reisman 1977). It is doubtful that equality in herds ever existed, and to assume it in terms of a land tenure policy is equally unwarranted. We know from the Cameroonian data that a large proportion of the animals herded are owned by a few very powerful and rich Peul, living in towns, who also manage trade and large farms. Most of the herders with whom we talked on the range had the overwhelming majority of their cattle through a haba n'ai relationship, where the cows are loaned by wealthy individuals to a person trying to build up a productive herd. Many of the herders were just working for someone else and did not own any animals personally.

Therefore, what we are doing is improving the range, and then having it carefully demarcated and set aside for people who can afford certain proportions of the capital expenditures made. Solidifying the tenure arrangements will in this case solidify the class differences (v. Kanel 1971). It would make sense for us to determine first which type of livestock-raiser in an area is producing the greatest offtake and responding most to veterinary and other extension efforts.

Finally, the discussion of the cultural milieu in which the projects in Mali will have to operate emphasizes the point made repeatedly that land tenure in arid regions of Africa needs to be not only flexible but dynamic. Land tenure for much of Mali codifies a bundle of rights of usufruct, allocation, distribution, etc., to a general area held by differing groups for differing parts of the year. And, as we have seen, these rights can be adjusted through negotiations as seasonal vagaries are encountered.

The call for land tenure change, reform, or modernization for Africa's arid land economies has come from many different quarters. Some see the problem of desertification, whether the result of climatic trends or misguided policies, as being resolvable only by changing social attitudes and organization (v., e.g., Walls 1982, Glantz 1980). These changes must take place, it is

argued, at all levels, with meaningful innovations in international as well as local priorities, decisions, and organization. Other observers see the need for major changes in land use at the local producer level. The tragedy of the commons, an idea popularized in development literature by Hardin's seminal article by that name (1968), states that resources like the arid range that are used by any and all are in reality owned by no one. Environmental deterioration and the consequent loss of economic potential are inevitable results as soon as the number of people using these resources exceeds their carrying capacity. In this line of reasoning, existing land use rights and arrangements are not only an impediment to development but are deleterious to even maintaining already marginal standards of living. Some authors even call for doing away with existing land tenure arrangements as impediments to acceptance of the new techniques and technologies available (Jacoby 1971; Hodder 1974). The majority of the literature, however, sees traditional land use arrangements and practices as basically sound from an ecological point of view and attempts to settle nomads, etc., as in all probability doomed (Darling and Farvar 1972; Aronson 1980). In this case the traditional arrangements should be built upon, taking advantage of herders' long-term strategies (Konczaki 1978); but, as the analysis suggests, market-stimulated production decisions and a growing economic individualism now found among all classes of livestock managers have so altered the material foundations of traditional range management institutions that there is no way of resuscitating traditional range management institutions without also resuscitating traditional social powers, the basis of which would themselves be totally antithetical to modern production and market relationships.

This situation leaves the development community and national planners in something of a dilemma. In spite of our best efforts, our interventions do not result in things getting appreciably better for African livestock managers, on the one hand, while these same producers are facing a deteriorating environmental base and falling per capita production, on the other. The range is going to have to be used in new ways. The major technological solutions are already fairly well known. What we do not know is the nature of the man-land resource relationships that will allow us to cast our technological information into a form that is applicable to ongoing production systems. This relationship will have to be understood before there is much hope for extension efforts, training programs, integrated rural development projects, and the like. What is needed is a new paradigm or method of analyzing the land tenures of Africa's livestock managers. One of the problems has been that the open range has too often been viewed as a tabla rasa upon which rules of access, allocation, and duration can be written, with the assumption that that which is owned by all is owned by no one.

The range, however, can be thought of as composed of a variety of landed resources that can be involved in a single land tenure system. The two critical ones will, of course, be grass and water. Depending on the kinds and sex of animals that go into herd composition, the livestock manager must decide on his range strategy. It will include the relative merits of grass species, woody plants for browse, and the distance the animals can travel between waterings. A mixed herd of goats and camels will both browse, but one is confined to a fairly restricted range when compared with the other. The herder, then, must have grass and/or browse within adequate distance of water. Although this is all very elementary, it does mean that we would expect to find some form of

arrangement and expected behavior to be worked out over time between the various parties connected in some way to these resources.

For example, water can vary from large pump stations bringing water from several hundred meters below the surface to standing pools of water following a rainstorm. There will be varying degrees of permanency in each source of water, and the more permanent the source, the more likely there will be a formality of arrangements for gaining access to it.

The range can also include sites of activity that are of a more or less permanent nature. Camp sites are not randomly selected and may be returned to again and again on annual rounds. In fact, since so few livestock managers in Africa are purely nomadic (despite the popular picture), herders will likely have plots in cultivation at least part of the year, as well as housing sites in villages and urban centers. Some of these sites can have sequential users (e.g., camp sites) while others cannot.

Although we have touched on only the most obvious landed resources involved and have ignored others such as game or wild plants that are gathered for food, reeds for mats, and so on, we can see that there is the possibility of a livestock manager being involved in arrangements with others for needed resources that will vary from the relatively permanent and formal to the transitory and ad hoc. Be that as it may, we need also to examine for each system the modes people use to justify access to the needed range resources. The conceptualization from the local point of view will likely not see land as space to be divided but rather as a collection of resources. It is after all the resources that are important, not spatial boundaries. Yet most of our current thinking on policy alternatives for the effective management of these arid lands focuses on spatial boundaries containing an adequate resource base. Questions emerge as to whether we have included all the resources necessary. If it turns out in further investigation that we have not, we normally think in terms of altering our lines on a resource map. This, however, is only one possible solution, and it may just be that African pastoral economies may have something in their flexible and often overlapping resource utilizations that should be built on rather than discarded.

From the point of view of project design, the fact is that the people are there prior to implementation. But, as we have seen in numerous cases, the existing occupancy and possession of these resources do not exclude others who hold use rights based on prior occupancy, possession, development, etc. All involved recognize the legitimacy of these arrangements. Over many parts of Africa villages are comprised of cultivators who have moved into and are farming and herding their animals on a small section of a much larger range still used seasonally by others. Also, in the Saharo-Sahelian zone we have groups occupying their range at the discretion of others. Haratin livestock owners in Mauritania, for example, have rights only of immediate occupancy and possession. These can be abrogated or altered by others. The point is, social class differentiation, sexual division of herding labor, and so forth, determine the nature of resource access of the people in a project zone.

Modes of access are not likely to be static and are frequently transferred from one individual to another. A fairly straightforward example would be the transfer of allocation rights upon the death of a well owner. For Africa,

postmortem transfers of landed resource access are most likely to devise (be divided) by kinship rules and existing arrangements. That is, all those holding the required genealogical relationship to the deceased as well as those using the resource before the death will have their access rights recognized by the social group. In either case, the people using the resource in question will be doing so by rights well understood in the local community.

The kinds of rights transferred upon death will have been established in the first place at some point in the past by the first inhabitants in the area. We may call this a right by nomadic entry. We have seen, however, that in many cases the right of nomadic entry was established by contest of arms. The Tuareg and the Maures controlled their resource base not because they were first but because they were strongest. Once a range is in use, the subsequent groups gain access through contest of arms (Tuareg and Maures) or through negotiation and accommodation. The latter can take several different forms. It can be sequential by group. One herder has rights to water his animals first, followed by the second, and so on. There is also sequential access by season. This is very common where cultivators use land during the rainy season and herders use it after harvest during the dry season. Additionally, we have noted that access is given in exchange for goods or services. Usually this is a reciprocal agreement between two herding groups so that each has access to the resources of the other in times of need, drought, flooding, etc. Once we have established that a person or group has some kind of rights of access to range resources, we need to determine at which institutional level these are supported and backed.

Without being overly simplistic about it, one can see that it will make a difference whether the use of a resource is backed by law or by subjectively valued, time-honored rights. In the former case a person has access to and recourse through formal, legal machinery. In the latter we are concerned with the ad hoc arrangements that develop to meet the variety of situations in which people find themselves. That is, there are preferential behaviors that are expected, and, once people behave in the appropriate manner, their demands are backed by the full weight of culture. It is in this area of what we might label law-in-action that we find the rules of resource use that precede formal law or, when not recognized by the legal structure, often take precedence in actual observed behavior. We see also the unspoken expectations in the regulations for how long a herder can use the water of another. Just as a brief example: In the 1930s Schapera had noticed that when a Matswana put in a borehole at his own expense it was considered by one and all as that person's well (1943). This "law-in-action" preceded formal legal recognition by a couple of decades. The "rules" of resource allocation have been tested time and again during drought and against the environment. Since many of the resource rights involved will be of the unspoken law-in-action variety, it is the responsibility of the project personnel to understand them. Otherwise, one creates the unexpected environment for noncooperation with project inputs where these do not conform to existing resource rights and are not replaced with suitable alternatives.

In the analysis of land tenure issues in specific projects we have tried to point out just where one might look for such difficulties. It might prove handy to have some convenient labels to attach to the kinds of rights people feel are threatened. The choice of any set of names to apply to such cross-cultural phenomena carries with it the very real danger that the concepts that

surround the word in English will create a false notion of the social reality (v. AFRID 1980). What may be an unspoken expectation in the life of a livestock manager may easily take on a new reality once it is called a specific kind of right. We can try to reduce this danger as much as possible by analyzing the conditions and determinations associated with each one. First, however, let us try to group under convenient headings the types of range resource management rules we have noted.

Throughout our discussion we have pointed to the differing concepts of the degree to exclusiveness of use between the project designers and the livestock managers. In general, modern range management theory calls for making use rights much more inclusive to a specific set of people while excluding all others. Some sort of exclusion from use is necessary if there is to be any predictability in the management and rehabilitation of the range. Yet we have noted some of the variations that local producers follow even in regard to those resources that are privately owned. For example, in the Saharo-Sahelian zone where private property is recognized and backed by Islamic law, a person has a matrix of rights vis-à-vis a privately owned well rather than holding it "against all the world." The well owner has rights of trespass; that is, a person must ask permission before taking the water provided by God for the use of everyone that lies at the bottom of the well. The well owner also has rights of ejectment once the other person's needs have been met. What he does not have is the right of exclusion. The use of water resources by others is backed by necessity, unspoken expectations, religious prescription, and the Shari'a. This is a formidable array and it is not surprising that attempts on the part of projects in Islamic areas have been so unsuccessful at enforcing exclusive use to project wells.

The attempts to introduce more exclusive rights to a range are motivated by efforts to prevent degradation of a resource base. It is here where our analysis of existing forms indicates the least development. We might call this a right against decreasement, for want of a better term.[6] That is, a right against decreasement would mean a local herder could turn to some source to halt behavior by others that decreases the value of the range on which he has use rights.

To the problems with exclusivity outlined above we can add those that are associated with the fact that land use exchanges are not based on a market exchange but rather on exchange of use taking place within the context of social relations. From our investigation the principal right affecting livestock development projects is that associated with residual claims. As we have observed repeatedly, the people in a project zone are seldom the only ones having use rights to the resources. As we saw in the Senegal projects, people who live outside the project have seasonal migration rights that antedate the earliest ancestors of the current year-round inhabitants.

These residual rights can be of several kinds: seasonal, as in Mali and other Sahelian countries; eminent domain, as in Mauritania; reversion to

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6. Decreasement here refers to a somewhat narrower concept than the notion of rights against waste in common law, which would include <u>in our terms</u> decreasement by nuisance, etc.

another group once crops are harvested or some other act is finished; or, as is fairly common, ancestral reservation of group rights to a territory for use during drought. There is "no land in Africa without its owner," to quote a common saying. Even apparently abandoned land has claimants. We need to investigate the nature of these claims as far as possible before project implementation to prevent unnecessary and avoidable project misinterpretation.

Formally or informally, each type of range resource has its proper use and allocation rights. What is lacking is any mechanism for alienation by sale or permanent transfer. A group exchanges rights; they do not and cannot give them up completely. In fact, to whom would we turn for rights of alienation? The family herds are expected to serve as a perpetually renewable economic entity that will survive the living members of the social group. To paraphrase an Oil Rivers chief (Elias 1951), these rights to the resources necessary to continue the productivity of the herds belong to a vast family that includes the ancestors, a few living, and a vast number of unborn. The living are only trustees for this larger group. We cannot expect the cooperation of the living if they see their participation resulting in their children having fewer rights than they themselves had inherited. Since alienation is impossible from the point of view of the internal workings of the system, neither purchase nor enclosure is a viable alternative. This does not mean that the system is static and unchanging. Rather, we will have to understand its internal dynamics if we hope for any cooperation from the people whose behavior we hope to modify in some way. All the rights we have discussed, and they are by no means exhaustive, are for marginal resources that have very low alternative opportunity costs. Rights are diffuse and flexible just because the resources involved are so marginal.

We need, therefore, to examine more than just the rights surrounding each type of range resource. We need also to find out what are the conditions and determinations of these rights. That is, under what condition is a particular right altered? In addition, we need to ascertain what event or action determines the starting or ending of a livestock manager's use of a resource. In this fashion we will be able to derive empirically the dynamics involved. At the same time, we need to document the local institutional basis for resource use and allocation.

The concept of institution is used in two senses in the social science literature, and we need to clarify which use seems most useful for our purposes at hand. The first has to do with the structural morphology of the social system, to use Talcott Parson's term. Here it refers to a set of interwoven normative concepts built around one or more functions, that is, a subset within the social structure (Davis 1949). From the beginning, this view of institution has focused on the folkways, mores, laws, etc., that make up the shared attitudes of a group (Ward 1907; Cooley 1929). The other concept sees an institution in a much more purposeful light. An institution here refers to a group of individuals acting together to satisfy some desire, an organized system of purposeful activities. It is an example of the will in action as people try to accomplish some goal vis-à-vis definite relations to each other and to a specific part of their cultural or national environment (Commons 1924; Malinowski 1944). It is in this latter sense that we are using the term institution.

Since we are interested in organized action we need to investigate the nature of the social relationships that define the use and allocation rights associated with each resource. These units may be families, lineages, clans, herding groups (including sons, daughters, husbands, wives, widows, etc.), or some other institution that has yet to be identified. The knowledge of the kinds of rights associated with each resource will be of little use if we do not know which institution actually uses a resource. This will provide us with an empirical handle on the social reality associated with each right to the landed resources employed for each task in the annual round, i.e., the nature of the social action associated with each right of use and allocation. As the data indicate, there can be more than one level of institution involved in both use and control. Herders often do not own all the animals they are managing. In every group we have examined livestock are borrowed and lent to disperse a family herd over more ecological niches, to avoid taxes, because one's own family herd is too large to be managed as a single unit. The man in a project zone may, as we have noted, be working for wealthy town-dwellers. Rights to resources will be defined on at least two institutional levels in such cases. Finally, we will also be able to assess whether or not institutional change is taking place by what degree the social relations that make up an institution are different as control of the herd passes from one generation to the next and if members are making the same resource decisions.

No land tenure system, no matter how "traditional," is ever static. That is why we must look at the institutional basis of the rights we have noted. The rights by themselves give the impression of a false permanence. It is also necessary to document how people are organizing themselves to institute access to relatively scarce range resources. As has been pointed out, all alterations in the herding regime that change the way landed resources are used will of necessity change some part of the bundle of rights that make up land tenure.

Both the theoretical and the very real discussions of arid rangeland management have had an impact on African national governments' land legislation. In most cases the range has been nationalized to open the way for new policy innovations. As our discussion on a case-by-case basis demonstrates, this has often had the unanticipated consequence of opening up already overtaxed resources of a relatively small group to all citizens.

Still, it is with the existing national policy that the project designers must work. However, as we have seen throughout this analysis, livestock development efforts have been singularly ineffectual in changing range use. At best, the arid grasslands are used pretty much the way they were traditionally, and the major dislocations that have been reported have often been in large part caused by misguided colonial, national, or project policies and interventions. A point we have underlined, no doubt ad nauseam by now for the careful reader, is that the more fragile the environment, the more disastrous are the results of poorly researched and thought out policies. Wrongly conceived plans are thus potentially very dangerous to people in such ecological situations no matter how well intentioned.

At the governmental level these various rights are extinguished, replaced, or newly created by policy and legislation through exercising police power in the state's capacity as trustee of national resources. Government support for project aims, etc., should not allow us to overlook the fact that at the local

level many of the critical social relations are at least partially defined by various rights in landed resources. The allocation of rights are often the basis for social hierarchy, and they cannot be simply swept away by legislation. Whether we are talking about the West or Africa, however, no one owns land in some absolute sense "against all the world." There are always some restrictions, some rights in a piece of land that can be exercised by others. As Immanuel Kant pointed out long ago in addressing just this aspect of land as property, even the state exercising its ultimate police power does not own the land absolutely, but rather acts as the sovereign arbitrator for the citizenry (Kant 1797:90).

A new land tenure paradigm for range management will require a conceptual framework different from the one we are used to using. When European agriculturalists began to shift their concept of land as accessible only through social, political, and religious relationships to one where land was seen as a form of fixed capital like any other form of property that could be purchased by any individual regardless of prior relations to that particular piece of ground, we embarked on a novel transformation of land tenure ideology and practice. With individualism and private property, land takes on a whole different aspect than it had in previous ages. From this time on, land tenure law defended the individual rural entrepreneur's right to determine his or her own opportunity costs for using land in various ways. As long as one's decision did not infringe on the rights of others it was the owner's choice to cultivate in a certain fashion, leave land in forest, convert it to pasture, etc. Writers of this entire transition period (Locke to Ricardo) see inviolate ownership of land as the basis of political economy. The new conceptualization of land in turn required ever more exact records of who owned which parcels. This in turn has led to our rather static view of land and land tenure. Land units are the delineated element, and wealth for the agriculturalist is created on these fixed quantities of land. One person is more successful than another because he or she manages capital inputs and other dynamic elements better.

But if we have belabored one point more than any other it is the one that, at the present, it is not feasible for arid regions of Africa to be divided into fixed parcels to be used exclusively by a particular person or set of persons. History, climate, and increasingly fragile economies mitigate too strongly against it. Instead of a concept of tenure based on who has which rights in a specific piece of ground and its resources, we suggest that a better paradigm would be based on range resource use vis-à-vis transiency, inclusivity, and intensity.

Transiency encompasses a dimensionality of use. This dimension will have to include settled cultivators with livestock as well as camel nomads like the Rendille, Tuareg, or Maure with herd movements of 1,000 km or more. In addition, transiency encompasses the observed phenomenon of overlapping use of the same territory by similar herding groups, livestock managers with differing herd compositions, or people possessing entirely differing economies, as when pastoralists return to an area after cultivators have harvested their principal crops. How long this transient use lasts will be determined by season, climate, and custom as well as by herd management decisions. What the data also have emphasized is that transient rights will also include resources a herder can turn to in a worse case scenario, such as during a severe drought. These transient but residual rights are the economic and ecological safety valves of the system.

Transiency is the normal state of herding societies' strategies for the foreseeable future but only some herders have legitimate claims to use rights in any given area. Here we need again to reverse our usual way of thinking about land tenure. Normally we establish these rights and then assign exclusive rights to a definite party. The Africa material strongly suggests that we think instead of inclusive use in the case of arid land economies. That is, for every situation, who is included in those who have rights of one kind or another concerning landed resources? Like the livestock managers themselves we will have to conceptualize this in several dimensions at once: the kinds of rights, by resource, and upon which social basis for specific situations. Inclusivity will, then, be topological rather than algebraic due to transience and impact of climatic variability on the environment.

The third major dimension will be intensity of use. That is, how intensively and under what situations do livestock managers impact upon their resource base in major categories of situations? As we have seen repeatedly, resources that are used the most intensively are associated with traditional institutional development and local investment. Wells, watering schedules, trekking routes, access schedules to favored salt licks, and so forth are some of the examples we have elaborated above. These are also the most common types of resources, control over which has the most likelihood of having exchange value. Since exchange value is associated with social relations based on decisions and instituted procedures, it is here that we stand the best chance to bolster that weakest link in the bundle of rights that make up the land tenure system of the common range in Africa: rights against decreasement.

In summarizing, we have populations that are relatively transient at any one place and time but also manifesting great resilience over time. Tenure includes all groups of livestock managers who have claims against the range resources but may exercise them only occasionally in especially favorable or disastrous situations. Of course these relations also include the political sphere and the intervention of the state. Inclusivity has expanded beyond the local level to become part of a political ecology. And finally, the implication would be that development assistance is best associated with those resources having exchange value in the local economy.

Exclusive rights worked on the American range, it is true, but under differing population pressures and administrative history. In general, in Africa, the more fragile the environment the more dynamic will the tenure arrangements have to be to prevent resource deterioration. We suggest, then, that policy development, government interventions, infrastructural inputs, and development initiatives should view land tenure for livestock managers in arid sub-Saharan Africa as a bundle of rights being exercised along the three dimensions simultaneously of transiency, inclusivity, and intensity.

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