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LAND USE COMPETITION AT THE MARGINS OF THE RANGE -
LANDS : A PROPOSAL FOR RESEARCH IN KAJIADO DISTRICT

By

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ABSTRACT

The interface between pastoralism and agriculture in semi-arid areas is often a zone of competition over land use between farmers and herders. Population pressure in agricultural areas has resulted in migration of farmers into lands of more marginal quality, lands which are important dry season grazing areas for the pastoralists herds. Farmers cultivating these lands are likely to be severely affected by drought, while the loss of such areas from the dry season grazing reserves increases the vulnerability of pastoralists to drought. This Working Paper presents a proposal for the study of the problems associated with such competition over land use as it affects pastoralists and farmers in selected locations in Kajiado District.

INTRODUCTION.

This Working Paper presents a rationale for a proposed study of problems arising from competition over land use in Kajiado District. The objective of the research is to examine the existing land use at the postoral/agricultural interface, to assess its ability to provide for the needs of the population during dry seasons and drought, and to examine ways of improving the existing land use patterns and of providing suitable alternative or complementary sources of income.

Pastoralism occupies most of the area of the District and its viability under present social, economic and technological conditions is dependent upon the herds having access to sufficient dry-season pasture and water. The areas in which the pastoralists obtain these dry season resources are the betterwatered margins of the rangelands (OSUPUKO) and the swamps within them. Two other major land uses utilise these same areas: firstly wildlife, (which shares wet season grazing areas (OLPURKEL) with domestic stock,) has access to reserves which have theoretically been set aside for their exclusive use and which are located in areas within adequate dry season pasture and water; secondly farmers moving out of the crowded higher potential lands are cultivating these better-watered areas to an increasing degree. These areas are, however, often unable to support permanent cultivation due to the variability of rainfall and thus the process by which they are occupied by farmers and denied to pastoralists (whose access to such lands may also be reduced by the creation of wildlife reserves) increases the vulnerability of both groups to the impact of drought.

Difficulties facing pastoralists and farmers in semi arid regions have recently been brought to the forefront of international concern by the effects of the prolonged drought which affected large areas of west and east Africa, from Sahel to Somalia and Kenya during The early 1970's.

A vast literature has accumulated concerning the difficulties faced by the people of the Sahel, much of which has recognised that the climatic phenomenon, the drought, was but one among many other social, economic, environmental and political factors which contributed to the situation (3;4;6;8). Johnson et.al. (13), in a worldwide review of social and economic

aspects of desertification, have noted that the survival of these living semi-arid lands is affected not only by fluctuations in climate but also by a variety of social and economic processes including population change, technological change, the integration of local livelihood systems into under socio-economic systems and by variations in the strength and effectiveness of governments. In assessing problems of semi-arid regions in Kenya and Uganda similar contributory processes have been recognised (1;9;11;14;16;17;20;27;34).

The major objective of the proposed study is to examine the current state of land use in the areas of Kajiado District where the potential for competition between pastoral, agricultural and wildlife activities is greatest. The author's research in the Sahel suggests that one of the major contributory factors in the calamity in that area was that changes in land use on the pastoral/agricultural interface had increased the vulnerability of the population to the impact of drought. As a similar situation of land use change in the interface zone is occurring in parts of Kajiado District it may be useful to examine some of the processes which created difficulties in the Sahel as an introduction to an analysis of the problem in Kenya.

THE SAHEL

One of the results of the social economic and political changes which occurred in the Sahelian area of West Africa during and after the colonial period was a conflict over land.¹ A brief review of selected aspects of such conflict in Niger may serve to illustrate some of the dangers inherent in the continued annexation of marginal lands for agriculture.

Agriculture in the area is impossible without access to water from streams, marshes sub-terranean sources. Pastoralism is not viable if the animals are without access to dry-season pasture and water resources.

1. The discussion which follows is a highly simplified account of the complex social, economic, political and environmental changes which occurred in the Sahel as the French policies caused adaptations in the precolonial interactions in and between farming and herding communities (2;4).

The Hausafarmers of Niger traditionally based their food production on a complex land management system organized through the extended family. The family head, the mai gida, was responsible for the allocation of labour to the land, for the division of the area between cultivated and fallow plots and for the apportionment of the harvest between that needed for consumption and that stored as a safeguard against famine.

Rotational fallowing of the land was an important means of maintaining its productivity and was supplemented by manuring of the fields during the dry season by animals belonging to the pastoral group of the area, the Fulani and the Tuareg. These people engaged in seasonal migratory movements which enabled them to take advantage of the grazing and water resources available in that semi-arid and arid environment. In the dry season the herds were kept in the south, in the cultivated area, where they were pastured on the fallow land and on the stubble which remained in the fields after the harvest, and they were watered in the ~~marshes~~ or stream beds where the water table lay close to the ground surface. Under this system the farmers gained manure for the land, the herder obtained pasture and considerable exchange of animal products for grain took place between the groups. Once the rains fell the herders moved northwards grazing the animals on the new grasses and the farmers resumed cultivation.

This symbiotic relationship between farmer and pastoralist was disrupted following the colonization of the area by the French in the early years of the twentieth century. Colonial policy was implemented with little regard for its consequences on the local people who came to be incorporated into the colonial economy on terms dictated by the French. Initially the Tuareg remained at some distance from this system, having been heavily defeated by the French in 1917, a defeat which left them socially disoriented, politically alienated and with their economy disrupted.

The Hausa, being settled, were more readily incorporated into the colonial economy. Taxation caused them to seek cash earning opportunities which were limited at first to the growing of groundnut for sale to French trading companies and to participation in labour migration to work in the coastal states. In the agricultural sector the production of both cash crops

and food crops,² did not necessitate a reduction in the length of the fallow period while land remained abundant. After World War II however, a number of processes caused land to become more scarce. Population increase in Northern Nigeria resulted in migrations of Nigerians into Niger, while the population of Niger was itself growing, and the demand for agricultural land rose accordingly. The demand was met by an intensification of land use in the existing areas under cultivation and by an extension of the cultivated zone northwards into regions where rainfall was ~~more~~ uncertain in amount, duration and distribution. At the time of maximum movement into these areas, in the 1950's and early 1960's, there was sufficient rainfall to permit agriculture, but given that drought is not an infrequent occurrence in the region, this expansion into the drier margins did increase the number of people vulnerable to the effects of a drought.

Much of this northward expansion of the cultivated area took place into the more southerly, better-watered grazing lands while the intensification of agriculture to the south reduced the area under fallow and curtailed the access of animals to the fadama grazing and watering areas. This reduction in the availability of the more accessible grazing and water resources coincided with an increase in the demand for them from the growing human and animal populations in the pastoral sector. Cessation of warfare and provision of veterinary, medical and rangeland improvement programmes reduced animal losses due to raiding, disease and lack of water and in the context of social systems which encouraged large herds, animal numbers increased rapidly. Warnings as to the possible outcome of these conflicting demands for land were sounded as early as 1959 by Jean Dresch:

"Under these conditions, the simultaneous occupation of the Sahel by pastoralists and sedentarists is not without its dangers. The Sahel has, by definition, a marginal climatic regime where the physical and bioclimatic equilibrium is fragile. If the process

2. Some farmers began to sell their surplus food crops in the towns which developed as centres of colonial administration and as markets for the local cash crops, and thus in some cases food crops were also cash crops.

continues with no measures taken to control and protect pasture the cattle population will soon be too large. It is evident that the amount of fodder needed by each head of cattle increases with dryness, a greater grazing area is needed the longer the dry seasonthere is still a margin for expansion but it is no longer readily exploitable because of lack of wells and the increase of cultivated land reduces the available pasture.

Meanwhile the area under cultivation is increasing rapidly. Both herder and farmer burn stubble and busheseach village is surrounded by a degraded area, a true biological void resulting from both trampling by animals around wells and from the repetitive cultivation of the land around the villages. The sand of the fossil dunes is completely denuded.....The villagers must go so far from the village to grow crops that they sometimes set up pioneer settlements near the fields and occasionally abandon the old one. Patches of desert appear and grow, patches where agriculture and grazing will not be possible without a long fallow period."(7:12)

The dangers which Dresch warned of became a reality in the early 1970's as a drought catalysed a potentially serious situation into a calamity.

It is clear from the experience of the Sahel that there is a limit to which the zone of cultivation can expand into the semi arid margins without (1) placing the cultivators at risk and (11) endangering the viability of pastoral systems in which access to the semi-arid margins for dry-season water and pasture is vital.

SEMI-ARID LAND PROBLEMS IN KENYA.

That a situation of competition over available land between different land exists in the semi-arid regions of Kenya has been widely recognised. The Republic of Kenya Report to the U.N. Conference on the Human Environment stated that:

"In Kenya today we have reached a situation where land use interests such as agriculture, tourism, ranching, wildlife management, forestry and water conservation, - each of them valid and nationally productive uses of land - are in some instances in competition and often in

conflict over large areas of the country" (21 : 24)

and it recommended the adoption of policies which would encourage the conservation of natural resources and the implementation of activities designed to reduce "land degradation, the destruction of watersheds and the encroachment of desert." (21 : 25)

The complexity and the dangers of the issues arising from the increase demands for land from a growing population are also reflected in this Report in its review of marginal lands:

"Population pressure in the high potential areas, the need for cash, and a transition of certain tribes from a purely pastoral and nomadic existence to a semi-pastoral/semi-agricultural one, has meant that increasing areas of marginal lands are being put under "snatch" crops. Due to the unreliable rainfall in these areas there is a tendency to occupy the higher sections on the slopes of hills, thus inviting soil erosion, and at the same time a failure of the rains can mean a total loss of the crop followed by the necessity of famine relief imported at considerable cost from the high potential areas. The general result of this form of agriculture in these ecologically delicately balanced areas is to convert potentially good quality grazing land (for livestock or wildlife) into areas of lower fertility....." (21 : 32)

In Kenya, therefore, a process of competition between livestock, wildlife and farming in the marginal lands exists. The origins of the movement of farmers into the marginal lands have been traced to the land distribution and tenure systems which developed under the colonial government and continued into the postindependence period (18). The former white highlands remain areas of low population density relative to the quality of the land resources, while the former trust lands are overpopulated (16)

The development of a situation of overpopulation in the former Trust Lands was accompanied by social and institutional changes which disrupted traditional patterns of land inheritance and access to land rights. In consequence significant numbers of people became potential "squatters",

migrants to lands for which they did not hold title.³

The main focus of these potential squatters are the towns and the marginal lands surrounding the densely populated higher potential agricultural areas. The urban centres are unable to provide work for the majority of these people who are thus placed in the situation of attempting to farm land in the marginal areas. The process of migration from Machakos District has been studied by Owako (19) and by Mbithi and Wisner (17). The latter study shows that population growth in the drier areas adjacent to the higher potential lands of Eastern Province is substantially higher than the national average, reaching 24% and 33% in places (-17:15). Though these increases are based on a relatively low initial population they do illustrate the importance of the more marginal areas as recipients of migrants from over-populated areas.

The squatter in the marginal lands .

"exploits natural resources by cutting down trees and forests for charcoal burning, poaching wild animals, bush burning, and practising poor farming techniques with no fertilizing or soil conservation." (16:10)

and considering

"the rate of population growth, and the type of subsistence economy, it is clear that the people of the eastern marginal lands are more vulnerable to drought-induced famine, and the overall, long-run famine potential is highest in this zone. If population continues to grow in this marginal zone at the present rates, with no significant change in technology, even a local drought..... could mean massive relief problems for the national government" (17:13)

It is evident therefore that the movement of farmers into the lands of marginal productivity increases their vulnerability to the effects of

3. Mbithi and Barnes estimated that in 1975 the number of potential squatter was increasing at the rate of about 75,000 every five years on an estimated base of 300,000 already roughly enumerated (16:127).

drought, while the lack of attention paid to the conservation of the vegetation and fertility of the soil may reduce the possibilities of the land being used for grazing of cattle or wildlife.

The importance of these marginal lands to wildlife and pastoral systems lies in their often being the most accessible sources of dry season waters and pasture. In the absence of mechanisms by which farmers permit access to these lands during the dry season their loss to the grazing area can be crucial.

In order to safeguard the wildlife resources of Kenya wildlife reserves have been established which enclose permanent water resources and thus provide dry season security for wildlife regarding water and pasture. No such protection of resources has been instituted for the Maasai. On the contrary, colonial land policies, the expansion of agriculture and the creation of wildlife reserves have severely curtailed their access to essential dry season resources. The process of land adjudication might have given some protection to these lands but in many cases the area adjudicated was insufficient for pastoralism and individuals owning small plots often sold them to farmers. In other cases individual ranches occupied land which had "Unusually favorable conditions of relatively high and consistent rainfall and the presence of both wet and dry season forage" (9:20); that people in even these areas needed to move in response to environmental conditions was demonstrated by the migration of people from the Sultan Hamud /Emali area to Amboseli during the dry period after 1969.

Contemporary problems facing the Maasai need to be examined in the context of the social, political, economic and environmental changes which have impinged upon them in the past century. In the mid 19th Century the Maasai, occupied large areas of the Rift Valley, lands which had good grazing and water resources, and thus were able to develop an extensive animal Management system. Prior to the European period disease and drought limited cattle numbers and thus in order to maintain sufficient animals to provide for their subsistence and social needs the Maasai permitted cattle numbers to grow as large as possible. Whenever an area became denuded and overgrazed there was sufficient land for them to move on to new pastures. Thus the Maasai animal management system developed under conditions in which drought and disease limited cattle

numbers while overgrazing did not give rise to severe difficulties as their mobility permitted them to move quickly to green pastures.

The implementation of colonial policy resulted in these parameters of the system being altered. Firstly the area over which the Maasai could graze their animals was progressively reduced such that they lost access to some of their best-watered pastures and secondly veterinary and other range management developments were implemented such that the controlling factors of disease and water availability were reduced through inoculation campaigns and by the provision of permanent water sources in the rangelands.

Prole (20) writes that in the 20 years prior to the 1960-61 drought cattle numbers increased for many reasons including:

- i) grazing was generally adequate during that period
- ii) boreholes were provided in areas where surface water was previously available only after rain
- iii) effective rinderpest vaccination became available
- iv) the Maasai remained reluctant to sell cattle
- r) stock sales poorly attended and often cancelled due to outbreaks of food and mouth disease

Thus as the social system had not altered animal numbers increased while the area available for grazing, particularly dry-season grazing, had decreased as a consequence of land agreements made by the British, and the creation of wildlife reserves where cattle grazing was discouraged and by encroachment of farmers into the wetter margins of the rangeland. These processes resulted in overgrazing and degradation of the rangeland. As the severity of the effects of a drought are determined by the prior condition of the rangeland the area thus became more vulnerable to the impact of drought (27).

It is clear that competition between the various land uses in semi-arid areas may increase the vulnerability of the inhabitants to the impact of drought. It is unlikely that agriculture can of itself provide long-term security in these areas and Mbithi (15) has shown that farmers in these areas tend to have alternative sources of income to supplement their earnings from agriculture. The rangelands are able to support large numbers of wildlife

and domestic animals on a permanent basis only under conditions whereby grazing is extensive, the animals are mobile and there are areas to which the animals can move in order to obtain dry-season grazing and water.

As far as wildlife is concerned access to dry-season grazing and water resources has been safeguarded by the creation of wildlife reserves. In the wet season the animals disperse over the surrounding plains areas, and also grazed by Maasai livestock. Thus the Maasai herds and the wildlife of Kajiado District share the area of wet season occupancy while during the dry season the Maasai are denied access to areas reserved for wildlife. The viability of the wildlife activities exists to a large extent, therefore at the expense of the pastoral system. Thresher (28;29) is investigating mechanisms by which the income generated from wildlife activities (tourism, hunting, cropping etc.) may be used to reimburse the pastoralists' costs. Such mechanisms may enable wildlife and pastoralism to become more complementary and less competitive.

The costs incurred by the pastoralists in accepting the alternation of land for wildlife reserves increase as the problems of finding adequate pasture grow. Thus as herds increase in size, as weather conditions deteriorate and as farmers continue to encroach upon marginal lands so the amount of pasture available for the animal decreases and the "attractiveness" of the reserves increases.

There are similar processes at work in the semi-arid areas of Kenya as existed in the Sahel in the year prior to the onset of the drought in 1969. Lands of major importance for pastoralism but of marginal utility for agriculture are being brought under cultivation as various pressures in higher potential agricultural zones cause outmigration to the marginal lands. The situation in Kenya is more complex due to the major importance of wildlife activities in these same areas. The needs of both pastoral and, agricultural communities for scarce land resources and the immense foreign exchange value of wildlife pose hard decisions for those concerned with land use planning.

THE PLANNING CONTEXT IN KENYA

The dilemma which arises from the need to increase agricultural production, to develop the tourist industry and to maximize returns from pastoralism is expressed at the national level in the 1974-1978 Development

Plan (22), in the World Bank Economic Report (35) and in the District Development Plans (23;24;25). As the potential for increased production from the high potential areas is limited under existing technological and socio-economic conditions, greater attention is given in the plans to expanding the area under cultivation in the medium potential areas while safeguarding the needs of pastoral and wildlife activities.

This dilemma is reflected on the District Development Plan for Kajiado (23):

"the most important objective of the Plan as far as Kajiado District is concerned is to develop the rangeland potential, with consideration being given to benefits which might be realised from wildlife as a complementary (or even alternative) enterprise to livestock (23:8); a variety of measures designed to promote these objective are discussed including intensification of veterinary services, improved extension services, and improvements in marketing facilities.

While emphasizing the importance of livestock and wildlife the Plan also contains proposals for the expansion of the area under cultivation. A few areas in the District are suitable for agriculture e.g. those around Loitokitok and Ngong (23:3) and an increase in production from these areas is envisaged through the expansion of the cultivated area from 2030 hectares in 1974 to 4020 hectares in 1978 (23:9).⁴

4. In reviewing the proposals for the expansion of different crops the following picture emerges-

COFFEE - grown principally at Loitokitok. Targetted expansion from 20 hectares in 1974 to 80 hectares in 1978.

HYBRID MAIZE - grown at Loitokitok and Ngong. Expansion of area from 1000 hectares in 1974 to 2000 hectares in 1978 envisaged.

PYRETHRUM - grown mainly at Ngong. Area should increase from 15 hectares in 1975 to 40 hectares in 1978.

COTTON - grown in the Rombo and Kimana areas where minor irrigation schemes are to be encouraged. Expansion from 150 hectares in 1974 to 400 hectares in 1978 planned.

Conflict over land between pastoralists and farmers in Kajiado district dates as far back as the 1920's (26:38) when Kikuyu farmers were forbidden from cultivating in the Ngong and Narok areas. Cultivation is widespread around both Loitokitok and Ngong today and it is conceivable that the proposed expansion in the cultivated area will exacerbate the situation. It is important that the areas required for dry season pasturing and watering of livestock be described and access to them safeguarded, for should the pastoralists be denied such access they may well resort to forceful means or to grazing in the wildlife reserves, as occurred during the past dry season.

In order to be able to draw up appropriate plans for the area it is necessary that the existing needs of pastoralists and farmers for access to the land located on the margins of the rangelands be assessed. If contemporary trends suggest that the demands from both groups are increasing then decisions as to the allocation of land will have to be made urgently. Should this not be done then a potentially disastrous situation may arise.

SUMMARY

Similarities exist between the situation described for part of the Sahel and that existing in Kajiado District:

- i) the climate is characterised by alternating wet and dry seasons and drought is a known and not infrequent occurrence.
- ii) in both regions farmers occupy areas which receive higher rainfall or where water is accessible while pastoralists migrate seasonally into areas where grass is available following the rains. In the dry seasons the pastoralists move to areas where permanent water and pasture are found. In Kenya wildlife follows a similar seasonal mobility pattern to that of the pastoralists cattle.
- iii) A variety of social and economic processes has caused the agricultural areas adjacent to the rangelands to become overpopulated and migration of farmers has occurred into the drier margins, into areas where pastoralists traditionally sought dry season grazing and water supplies.

- iv) As a consequence of the climatic constraints farmers in these drier margins are more vulnerable to the effects of drought.
- v) Technological developments in range management have reduced animal losses due to disease and lack of water. In the absence of social changes and of the development of alternative control mechanisms, animal numbers have increased rapidly.
- vi) This increase in animal numbers has occurred at a time when the availability of dry season pastures is reduced, thus increasing the vulnerability of pastoralists to drought.

THE RESEARCH.

It is a knowledge of the great difficulties to which land use change contributed in the Sahel and of the similarities which exist between the processes of land use change in parts of the Sahel and parts of Kenya which provides the context for the proposed research.⁵

In order to develop planning proposals which may direct land use change such that the disastrous situation of the Sahel is not repeated in Kenya, it is necessary to document the current status of land use in areas where agriculture, pastoralism and wildlife overlap, to assess the range of alternatives to the contemporary patterns of land use, and to investigate

5. Current research in Kajiado District regarding problems of land use include: Wildlife Management Project of UNDP/KAO in seeking to improve the management of wildlife populations and is so doing is investigating: the biological and zoological conditions affecting wildlife. (5); the economic of wildlife utilization (28,29); the nature of competition for food and water between wildlife and domestic stock (30). It will also develop wildlife inputs into land use plans and advise ranchers on how best to make use of wildlife in managing their land. Dr. David Western continuing research into the ecology of the Amboseli area (32). ILCA is about to embark on a study of social and economic aspects of pastoralism.

the degree of complementarity between these activities.⁶

To this information required regarding the contemporary situation and trends in the pastoral and farming economies with reference to:

1. The land areas to which each group has rights in terms of legal tenure and the land uses to which that land is put.
It is important to locate the lands over which disputes regarding rights of usage arise.
2. An assessment of the major economic social and environmental problems which confront the people of the area.
3. The needs of the people for services eg. Water supply, roads, marketing facilities health and veterinary care etc.
The ability and willingness of the people to pay for such services
An analysis of these needs and of the means of raising money to pay for them may provide information as to possible avenues for stimulating the economy of the area.
4. The difficulties faced by the people during the drought of last year and the adaptations they made to overcome/accomodate its effects. Analysis of peoples' reactions to drought may provide information regarding possible alternatives to contemporary activities. In time of stress resistance to participation in certain activities may be overcome by the severity of the situation though not favoured by the traditional society the types of activities engaged in during a drought may indicate those most likely to be resorted to should the traditional livelihood system break down.
6. The FAO/UNDP Wildlife Management Project among others is already assessing the potential complementarity between wildlife and ranching, see for example Western (32), Thresher (28), Hampson (10). Opportunities for reciprocity between cultivation and grazing may exist as for example between Hausa farmer and Fulani pastoralists in West Africa. In this case land cultivated by the Hausa was made available for grazing by Fulani cattle after the crops had been harvested. The cattle were thus able to graze on the stubble while the manure enriched the soil for the farmers. As traditional reciprocal arrangements between the Hausa and Fulani broke down and as land became increasingly short, conflict became more frequent as the farmer demanded cash payment for the right to graze and problems arising from trampling of crops by cattle increased(13). Though problems exist in the development of such reciprocal arrangements they do appear to have had a valuable role in the Fulani and Hausa economies and may be an appropriate alternative to competition over marginal lands in semi-arid areas of Kenya.

For example the Tuareg of the Sahel traditionally avoided labour on the land. Thus very few were prepared to engage in manual labour or in agriculture as an alternative to pastoralism during the recent drought but significant numbers moved to towns and took up work as watchmen or set up businesses based upon handicraft production. Plans for diversification of Tuareg life which incorporate activities compatible with the values and experience of the existing social order are more likely to succeed than those which promote sedentarisation accompanied by agricultural activities which were traditionally carried out by vassals or those of lower social class.

Further indications of such alternatives may be obtained by examining cash incomes and expenditures during the drought as a particular response to it.

It is reasonable to expect that the greatest need for cash will occur during a period of stress for the local economy. The usual mechanisms for providing for some demands may be disrupted and the market may therefore become the most readily available source for these needs. The sources of income and the form of expenditures during a drought may provide valuable insights into the monetary flows within subsistence economies which may be anticipated in the future should these economies change in response to deterioration of environmental conditions or in the balance of land use between farming, grazing and wildlife.

5. Their assessment of and attitude towards alternatives to agriculture and pastoralism and of the future of their contemporary way of life.

METHODOLOGY.

A survey of pastoralists, farmers and wildlife managers will be conducted in selected areas of Kajiado District in order to clarify some of the above issues. Questionnaire (available from the author) have been developed for pastoralists and for farmers, the emphasis being different for each land use. The method of approach most appropriate for eliciting responses may differ from group to group. For example the Maasai have a tradition of group discussions to settle questions or disputes affecting their way of life and it may be that a discussion format will be most appropriate in seeking their responses to these questions. Farmers have, on the other hand, been more responsive to questionnaire survey in the past and thus interviews with individual farmers may be the most suitable method for getting their responses to these questions. Interviews

with wildlife managers will be prepared and arranged in cooperation with the Wildlife Management Project of FAO/UNDP at a later date.

The surveys will be conducted in a number of areas of Kajiado District where farmer and pastoralists are located in close proximity to each other. The interviewers will be required to interview heads of families from each of three zones - the predominantly agricultural area, the predominantly pastoral area and the zone separating the two in which it is anticipated that both pastoralists and farmers will be located. This "transect" survey approach has been used in similar areas by Mbithi (16;17) ~~in~~ Kenya and in a number of other areas (see contributions to volume edited by White (32).

Preliminary survey suggests that the areas most appropriate for study are those around the towns of Loitokitok and Ngong and also the Nguruman escarpment. Transects in the Ngong area will incorporate hillslopes and the surrounding plains and will be drawn on each side of the Ngong Hills. In the Loitokitok area the transects will cross from the hillsides to the plains and will include swamp areas, located in the plains, where farming is becoming increasingly important. The Nguruman area is included as little is known regarding the land use problems of that area.

It is intended that the interviewers will work in pairs - one being a Maasai and the other a member of the farming group represented in the area in which he is working. The pairing of interviewers is done in order that problems of social and linguistic conflict may be reduced in the conducting of the survey; the Maasai will interview Maasai respondents and the farmers will respond to the interviewer from the farming group.

The data gathered from the questionnaires will be supplemented by and cross-checked with information from discussions with the interviewers in a 'debriefing session' and with information gathered at meetings with the respondents at which the results of the questionnaire survey are reported. The latter meetings will enable the interpretation of the data to be examined and will provide an opportunity for the discussion of issues raised by the study and of proposals for dealing with the problems.

The follow-up meetings will, it is hoped, include local representatives of wildlife managers, thus providing an opportunity for the problems associated with wildlife to be aired. It is hoped that at a post-questionnaire-survey stage, the views of wildlife managers vis a vis conflicts over land use may be obtained.

It is anticipated that land use proposals may be developed which attempt to be compatible with the needs of the peoples of the areas concerned and consonant with the overall objectives of the Government regarding future developments in the area.



Appendix A.

The following represents the range of questions to which responses are required. As stated previously the most appropriate technique for eliciting responses to these questions may differ from one group to another. The questionnaires are available from the author who would appreciate comments from those who may be particularly interested in the questionnaires themselves.

FARMERS

INTRODUCTION

1. Location of Interview - District, Location, sublocation
2. Demographic characteristics - members of family by age & sex
3. Land Tenure - Is title registered? If NOT the; not surveyed; surveyed only; in dispute; surveyed and demarcated; squatting; other (specify) _____.
4. Area of farm; area under different crops & fallow
5. Has proportion of area under different crops changed in the last 5 years?
6. Has the area under fallow changed over last 5 years?
7. What animals are owned? Type and number (estimates if necessary)
8. Access to water - distance; type: well, standpipe, river etc.
9. What agricultural implements are owned?
10. What are the sources of cash income?
11. What are the major problems facing the farmer
 - land shortage, water scarcity, health, food supply etc.
 - how severe are these problems -
 - what is he doing to alleviate the major problems.
12. How long has respondent been in the area?
13. If he has moved in the last 10 years-----
 - where from, for what reason did he move?
 - why did he chose the present location?
 - is the present location better than the one he moved from? Give reasons.
14. Will he consider moving from the present location?
 - If YES - for what reason?
 - where will he move to?

EFFECT OF DROUGHT IN PAST YEAR

15. Have the weather conditions in the past year caused problems for the farmer?
16. Were there any deaths in the family
 - if yes - what age? sex?
 - cause of death?
17. Was there a shortage of food? Was crop production affected?
18. Did any animals die? Which animals
when
19. How did you get food
 - used stored food
 - used food harvested
 - sold crops harvested
 - used cash savings
 - sold cattle for cash or food
 - obtained food from famine relief
 - obtained food from family or friends

RESPONSE TO DROUGHT

20. Migration - to relatives, town to work to other area to work?
 - who moved, when, where to?
 - did the move succeed in helping the situation?
21. Cropping - Did you change the crops planted or the location of fields?
22. Did you pray for rain or pay a rainmaker?
23. Is hunger common in your family?
24. How many bad years do you remember in the past 20 - 10 - 5 years.
25. What was the impact of past droughts on crop production?
26. How severe was last year's drought in comparison with previous ones?
27. Did people react differently to the conditions during the most recent drought than they did in the past?
 - if YES specify.
28. Do you anticipate droughts in the future?
29. Do you anticipate famine in the future?
30. If Yes what are you doing to protect yourself against it?
31. Will you remain in this area?

CASH NEEDS IN PAST YEAR

32. Was any income earned by members of the family away from the farm last year?
 - if Yes what was the approximate amount?
 - What was the source of the income?
 - how often is farm income earned?
33. Estimate farm income last season from - livestock, food crops, cash crops etc.
34. Compare farm income last year with average.
35. Identify principal non-food expenditures last year?
 - seed, animals, clothing, school fees etc.

LAND USE CONFLICT

36. What is the respondent's opinion of the number of people in the sublocation in comparison to the amount of land?
37. Have you had any problems with other farmers over the use of land in the past year?
 - If Yes specify
38. Have you had any problems with cattle herders during the past year?
 - trampling grazing etc - how severe?
 - why did the problem arise?
 - what did you do about it?
 - is the frequency of conflict increasing?
 - do you see the situation getting
 - better/worse - during the next 5 years?
39. Have you had any problems with WILDLIFE in the past year?
 - what sort - trampling, grazing, predation
 - why did it arise
 - what did you do about it?
 - are problems with wildlife becoming more acute?
 - do you think things will get better over the next 5 years?

ALTERNATIVES TO AGRICULTURE

40. Have you ever worked at anything other than farming?
 - If YES specify.
41. Have you ever considered doing any other type of work?
42. Have you ever visited -
NAIROBI MOMBASA VOI NGONG MACHAKOS EMALI LOITOKITOK ect.
43. For what purpose have you visited towns?
 - Job, market, social, etc.
44. How frequently do you visit your nearest town?
45. How do you travel there? walk, bicycle, bus, matatu, others

46. Have you ever considered moving to a town?
 - to do what?
 - with/without rest of family?
47. What rate of pay would you expect from a job in town (K/- /week)
48. Do you send any children to school? specify.
49. What future do you see for those at school?
50. What future do you see for those not at school?

PASTORALISTS

INTRODUCTION

1. Location of Interview - DISTRICT LOCATION SUBLOCATION
2. Demographic characteristics - members of household by age and sex
3. Land Tenure - shareholder in group ranch; individual title, area not surveyed etc.
4. Does any member of your household do any farming?
 - who; where; what area in hectares; crop produced etc.
5. What animals do you own? - type, number, (estimates)
6. Access to water
 - which areas do you graze in during the wet season?
 - which are your principal sources of water in the wet season?
 - which area do you graze in during the dry season?
 - which are your main sources of water in the dry season?
 - are any areas which you used to graze in 5 year ago no longer available to you?
 - which ones; why?
 - has your access to water and grazing become more difficult in the last 10 years?
 - specify
7. Do you have access to -- dips, veterinary services, cattle markets, schools, medical facilities, etc.
8. What are your main sources of cash income?
 - sale of cattle; sale of milk; sale of handicrafts; money earned by a member of the family away from home.
9. Do any member of your household work in occupations other than cattle herding?
 - If YES - who, what job, amount of income, amount of money sent to family, etc.

10. What are the major problems facing the herdsman?
 - lack of animals (specify)
 - lack of access to water and pasture
 - disease of animals
 - ill-health of family
 - lack of labour
 - lack of food
11. What is the herdsman doing to overcome the more severe problems?
12. How long have you been herding in this area?
13. If you have moved in the last 20 years: Where did you move from
14. Why did you leave that area
15. Why did you choose to move to the present area
16. Are conditions better here
17. Do you intend to stay

EFFECT OF DROUGHT IN PAST YEAR

18. What were the main problems you faced in the past year?
19. What was the cause of these problems?
20. How many animals did you have before the drought? (estimate)
21. How many animals do you have now (estimate)
22. Were you faced with hunger last year?
 - If YES -
 - how did you get food: sold animals
 - used savings
 - planted crops
 - sold handicrafts
 - obtained famine relief
 - where did you get food
 - who did you get food from
23. What were your major cash needs in the last year - estimate amount, food, clothing, cattle, medical expenses, taxes, school fees, travel
24. How did you get money to pay for these needs -
 - sold cattle, used savings, sold handicrafts, took a job -
 - type - askari, manual labour, agriculture
 - where
 - income

25. Did you receive any money from tourists or from tourism last year?
(specify)
26. Did you receive any money from WILDLIFE activities last year?
(specify)

RESPONSE TO DROUGHT

27. Did you move your location during the last year? where to, why?
28. Did you move your animals in search of water and pasture? where to, was the move successful?
29. Did any member of your family leave to look for wage employment in the last year? - who, where to, what job, did he succeed?
30. Did you seek help from relatives?
31. Did you get help from the government?
32. How many times did the family move in the last year?
33. Did moving improve the family's well-being?
34. Did any member of the family attempt to grow crops?
- specify.
35. Did you pray for rain or pay a rainmaker?
36. Is hunger common in your family?
37. How many bad year do you remember in the last 20 - 10 - 5 years?
38. How bad was the most recent drought as compared with previous ones?
39. Did you move your location in response to previous droughts?
40. Do you anticipate drought in the future?
41. Do you anticipate famine in the future?
42. What will you do to protect yourself against the effects of drought and famine?
43. Will you remain in this area?

LAND USE CONFLICT

44. Have you had any problems with farmers in the past year?
If YES
 - over what issues?
 - access to water
 - access to grazing
 - trampling of crops
 - encroachment of cultivation
 - why did these conflicts arise
 - what did you do about them
 - is the frequency of conflict increasing
 - do you think that the situation will improve/get worse over the next 5 years.

45. Have you had any problems with WILDLIFE in the past year?
IF YES

- what sort of problems? - predation
 competition over grazing resources
 competition over water resources
- why did these difficulties arise?
- what did you do about it?
- are problems with wildlife getting more serious?
- do you think the situation will improve or
 get worse over the next 5 years?

46. Have you come into conflict with the authorities in wildlife parks in the past year?

What sort of issues were involved?
why did the difficulties come about?
are problems over the Parks getting worse?

47. Have you had any conflicts with other pastoralists in the past year?
specify: cause, result, action taken etc.

ALTERNATIVES TO PASTORALISM

48. Have you ever done any work other than herding animals?
IF YES go to 50

49. Have you ever considered doing any other type of work?

50. What type of work would you do?
- askari
- labourer
- farmer
- other

51. Have you ever visited
 NAIROBI, MOMBASA, MAGADI, NGONG, VOI, EMALI, LOITOKITOK etc?

52. What was the purpose of the visit?

53. How often do you go to town?

54. How do you get there? walk, bus, matatu?

55. Have you ever thought of moving to a town
 If YES - where; to do what; with or without family?

56. What weekly wage would you expect? (K/-)

57. Do you send any of your children to school?
 If YES - age & sex

58. Are you happy that they are at school?

59. What do you see as the future for those that are at school?

60. What do you see as the future for those not at school?

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both primary and secondary data collection techniques. The primary data was gathered through direct observation and interviews, while secondary data was obtained from existing reports and databases.

The third section details the statistical analysis performed on the collected data. This involves the use of descriptive statistics to summarize the data and inferential statistics to test hypotheses. The results of these analyses are presented in a clear and concise manner, highlighting the key findings of the study.

Finally, the document concludes with a summary of the findings and their implications. It discusses the limitations of the study and suggests areas for future research. The author expresses confidence in the reliability of the data and the validity of the conclusions drawn.

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