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LANDUSE CONFLICT RESOLUTION:A CASE OF AGRICULTURE VERSUS WILDLIFE IN TANA RIVER DISTRICT,KENYA

BY

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ABSTRACT

Resource conflict occurs when two or more competing uses exist for the same resource. The Tana River District in southeastern Kenya has over the years seen such conflicts which are bound to intensify. But through proper resource planning and management such conflicts can be addressed.

The subject of this paper was to identify and examine landuse conflicts between agriculture and wildlife and attempt to resolve these conflicts. Sources of conflicts included water, space (land), and vegetation (as forage). Types of land use in the area included wildlife-based tourism, and agriculture (livestock and crop husbandry). Some recommendations for conflict resolution, proper conservation and management of the resources are outlined. These include the establishment of wildlife corridors, allowing pastoralists access to game reserves, compensation for losses due to wildlife depredation, multiple land use and so on.

INTRODUCTION

1.0 Preamble

Wildlife and agricultural resources contribute substantially to the Kenyan economy. Wildlife is the primary factor supporting the tourism industry and has been the highest foreign exchange earner since 1987. It contributed K£292 million in 1987 and K£349 million in 1989 to the national economy (NDP 1989; ESR 1989). Agriculture is the mainstay of the country's economy, generating one third of the national GDP, providing over 75% of employment and over 60% of export earnings (Riugu 1987).

The Tana River District (area 39,072 km^2) is one of the rangelands districts (Figs. 1,2) where the land is still used by the people in traditional ways of pastoralism and agriculture, and is representative of the less developed areas in the country. However, changes in land-use systems are evident, whereby the lower Tana river basin has in recent years become the focus of much development activity (TRDA 1974).

The Tana River (largest river in Kenya) is considered to have the greatest irrigation potential in the country in addition to its considerable potential for improved livestock production and tourism (FAO 1973).

Extensive irrigation schemes for cotton and food production have been initiated and implemented, extensive livestock production systems have been established, other activities have been planned. Also, new game reserves have been gazetted to protect wildlife and promote tourism.

These developments, particularly establishment of irrigation schemes and ranches are necessitated by the country's rapidly expanding human population (Tables 1a, 1b). The country has one of the highest birth rates in the world, standing at about 4% annually (NDP 1989). The district's population has also been increasing since 1962 (Table 2).

A challenge to feed this growing population is evident and calls for increased food production through improved methods of production (Govt. of Kenya 1986). This factor alone, which is believed to be the principal driving force, is likely to have effects on the traditional land-use practice patterns, and in effect, will have a major bearing on the numbers and distribution of livestock and wildlife in the district.

1.1 Issue Statement

Land development strategies initiated by the increasing human population, have generated changes in land-use patterns throughout Kenya. These changes are likely to have implications on the agricultural and wildlife resources of the Tana river district in space and time.

Pastoralists in the area face problems of decreased grazing land, the former grazing ranges of their stock having being taken by wildlife parks and reserves, ranches, irrigation schemes and other agricultural activities. Wildlife is also facing similar land-use conflicts and competition from agriculture and pastoralism (Fig. 3). Major wildlife species (all of them herbivores) which contribute more to the conflict by virtue of their dietary needs are listed (Table 3).

Overgrazing and destruction of vegetation, resulting from the conflicts of land-use types and from overstocking, are other problems.

1.2 Objectives

The principal objective was to identify types and sources of landuse conflicts in the Tana River District and to recommend strategies to resolve potential conflicts.

1.3 The Study Area

The study area, the Tana River District (Figs 1, 2), is located in Southeastern Kenya in the Coast Province. It lies approximately between the Equator and 3° 15′ south and 38°37.5′and 40°41′ east with an area of about 39,072 Km^2.

The district is bordered by Garissa and Lamu to the east and northeast, Isiolo and Meru districts to the north, Kilifi and the Indian Ocean to the southeast, Taita-Taveta to the south, and Kitui district to west.

1.4-Socio -Cultural Information

The major ethnic groups of the district are the Pokomo and the Orma. Other tribes are the Malakote, Korokoro, Boni, Sanye, Somali, and the Mijikenda (Fig.5). The Korokoro and Malakote are related to Pokomo, all of whom live along the Tana River occupying the eastern quarter of the district. The Mijikenda (a conglomerate of 9 tribes) inhabit the coastal areas, whereas the Orma occupy the western three-quarters to the west of Tana River. The Somali are found in the extreme northern part of the district bordering Garissa District. The Boni and Sanye live in the areas east of the Tana River. The Pokomo and other riverine tribes are arable farmers. The orma and the somali are nomadic pastoralists. The Orma keep cattle, sheep and goats, whereas the somali are mainly camel herders.

2.0-DISCUSSIONS

2.1-Source of Conflicts

The main resources which wildlife and agricultural activities compete for include water, space (land), food (vegetation includes forest).

2.1a-Surface Water

Surface water (rivers, pans, ox-bow lakes) and shallow wells are a great limiting factor in the lives of human beings, agricultural production (including livestock) and wildlife.

Water is an indispensable resource which has a tremendous control on the life of an organism including man and other animals, and influences the resources they depend on.

Its availability governs animal movements- its availability permits and its absence prohibits, dispersal and other movements (Allaway 1979). Seasonal mobility depends on water abundance. During wet seasons the animals spread out due to widespread availability of surface water, whereas in dry spells the movement is restricted to permanent sources. This is when competition and conflicts arise. A comprehensive account of surface water abundance ha been compiled (FAO 1973; Allaway 1979) (Fig.4).

The animals (livestock and wildlife) move to and from the Tana River during different seasons (Figs. 6a, 6b). During the wet season, movement is away from the river, eastward towards Garissa and Lamu, and westward to the interior of the district. This is governed by availability of forage and surface water. In the dry season,movement is towards the river (Watson et al 1973; Allaway 1979; Kufwafwa 1985). The movements away from the river are believed to be true for most wildlife species, though the relative movement for each species is unknown (Rep. of Kenya 1980).

2.1b-Vegetation

The significant role played by vegetation as a biotic component of the environment or ecosystem is well known. Vegetation serves as food, habitat and refuge (shelter) for a variety of livestock and wildlife. It is also a source of raw materials for industries (e.g paper, chemicals, construction) and fuel among several other ecological and economic uses.

There are various competing uses for forest lands between agriculture and wildlife. Forested land and flood plain vegetation along Tana River which also serve as food and shelter for various wildlife has been cleared for agricultural, fuelwood, and construction purposes (Allaway 1979; Loth 1988; Marsh 1976).

Incidence of fire along the Tana Delta and overgrazing due to large numbers of livestock and some wild herbivores are reported as factors responsible for vegetation destruction.

Decimation of forests by fire, logging and cultivation along most parts of the coast has occurred (Trent-Bunderson 1981). This author observed that the gallery forest of the Tana flood plain has been severely damaged by cultivation, charcoal burning, building and canoe construction. Remnants of this forest are in small fragments along the river north of Garsen.
The destruction of vegetation, especially woody types does not augur well, particularly for wildlife, who need it for shelter and food. The depletions of forests, especially the gallery forest is a threat to endemic and rare species of Crested Mangabey and Red Colobus Monkeys.

Some wildlife species require forested or woodland habitats, e.g elephant, buffalo, and waterbuck, hence destruction could have adverse ecological consequences. Moreover, elephants have responded to drastic poaching by seeking refuge in heavily forested areas (Trent-Bunderson 1981; Loth 1988). To protect these animals and plant species the Tana River Game Reserve was established in 1975.

2.0- Types of Land Use

There are three broad landuse activities:

a) Agriculture, both traditional and modern irrigated referring to crop farming;

b) Livestock rearing, constituting traditional and ranching or grazing blocks; and

c) Tourism.

2.2 Agriculture

Agriculture plays a dominant role in Kenyan economy and generates one third of the national GDP, providing over 75% of employment and over 60% of export earnings (Riugu 1987). Agriculture in the area is characterized by large and small scale irrigation schemes and traditional farming systems.

2.2a- Traditional Agriculture

Traditional agriculture is common along much of the Tana River stretching from Mbalambala in the north to the Tana Delta in the south (Fig. 2), principally on the fertile alluvial soils of the flood plain (Allaway 1979).

The need for farmlands has presumably led to clearing of forests by felling or burning . The slash and burning cultivation of the past seems to have subsided and the scope of the farming systems broadened, with modern techniques being adopted. Farm sizes range from 0.5 to 3.0 ha and crops grown are mainly for subsistence. These include maize, cowpeas, greengrames,and bananas. Farming is predominantly practised by the Pokomo and other riverine tribes, though Mijikenda, Boni, Sanye, and rarely Orma and Somali do when conditions become severe for animals (Allaway 1979).

Intensive agriculture has been encouraged by the rapidly growing human population. More land is likely to be devoted to agricultural production, thus reducing grazing land for both livestock and wildlife. Consequently settlements will increase and expand resulting in increased destruction of vegetation and interference with wildlife's use of nearby resources (Allaway 1979).

2.2b- Irrigated Agriculture

Irrigation can increase agricultural production through intensive use of the land (Riugu 1987). About 30% of the people in the district live within irrigation schemes (TRDDP 1989)(Fig.7). There are both major and minor schemes. The major ones are Hola and Bura.

Hola scheme which was started in 1965 supports about 600 families on 870-880 ha. Cotton is the crop grown on this scheme, with tenant holdings averaging 1.6 ha (4 acres). The Bura irrigation scheme which was initially planned to cover 6700 ha and settle over 5000 families has only 750 ha. supporting 1000 families (TRDDP 1984,1989).

The tenant holdings are 1.25 ha (3 acres) and major crops grown are cotton and maize.
The second phase of Bura scheme is supposed to be under implementation (TRDDP 1984). Tana the other scheme has an area of 600 ha and grows cotton.

The district has numerous small scale irrigation schemes. The lower Tana Village scheme, for instance has ten such schemes to settle 10,000 families. So far only five at Garsen are complete with an area of 600 ha under rice (TRDDP 1989).

There are also proposals to increase area under food and cash crops within and outside the irrigation schemes, mainly through the creation of numerous minor schemes (TRDDP 1984, 1989). Crop cover increased from 5,624 ha in 1982 to 34,573 ha in 1986 (TRDDP 1989). A massive 12,000 ha rice growing scheme, the Tana Delta Rice Project is being implemented.

The above developments will possibly increasingly alienate pastoralists and wildlife from their traditional grazing areas. The Hola scheme is off the flood plain and so competition from animals may be minimal, but Bura, Tana Delta and the minor schemes are within the flood plain and will be expected to have significant effects (Allaway 1979). The Tana Delta Scheme is within a critical dry season concentration area for both wildlife and pastoral livestock and so the effects could be even greater.

2.3 Livestock

This is an important form of natural resource use by people in the area. There are two categories involved: traditional pastoralism and ranching.

2.3a- Traditional Pastoralism

Traditional Pastoralism is practised by Orma and Somali people. However, change in land use pattern has encouraged mixed farming by these nomads (TRDDP 1984, 1989). The health of their stock has improved through the extension services of the Veterinary Department of the Ministry of Livestock Development.

The establishment of the Veterinary clinic and dips planned, are likely to improve animal health further.
Establishment of marketing centres, provision of more water facilities, crushes and two holding grounds at Kurawa and Wenje will also go along way in helping these nomads.

The problems facing these pastoralists is scarcity of resources, for instance, water, animal forage, and space which is compounded by competition from wildlife and arable agriculture. The former grazing ranges of nomads have been reduced by creation of parks such as Tsavo East national park, Kora and Tana River Primate National Reserves.

2.2b- Ranching

The history, concepts, planning and development of ranching in Kenya have been discussed comprehensively (Langat 1986; Muriuki 1986; Mwangi 1986; Sadera 1986). There are ten ranches in the district most of which are found in the southeastern part of the district within Garsen Division. Some of them have been developed and are operational (Table 4).

The principal objective of establishment of these ranches or blocks was and still is to improve livestock production and management of the rangelands for the benefit of the people concerned on a sustainable basis. Despite the benefits realized, the establishment of these ranches has demerits. As more ranches develop the pastoralists and wildlife will be alienated from their traditional grazing areas and the Orma might eventually be organized into group or block ranches (Rep. of Kenya 1980). This may lead them into sedentary existence, an issue that might interfere with wildlife movement, some of the commercial ranches have already excluded pastoralists, so have the holding grounds (Allaway 1979). This will certainly affect wildlife as well, by reducing their ranges and hence numbers.

2.4 Tourism

Tourism is an important economic use of natural resource in the district, mainly through wildlife, though there is a potential for tourism around Kipini based on its beautiful beach (TRDDP 1989).

There are two National Reserves in the area (Fig.8), Kora (area 1720 Km^2, gazetted in 1973) in the northwest, Tana River Primate (area 175 Km^2, gazetted in 1975) for Red Colobus, Mangabey, and forest habitat along the Tana in the south east. The latter Reserve is estimated to contain about 30-40% of the remaining monkey species in the world (TRDDP 1989). Part of Tsavo East National Park is also within the district. Despite the presence of game reserves, tourism volume is low mainly because of inaccessibility (Rep. of Kenya 1980). Plans to promote tourism are under way, involving infrastructure improvements like construction of roads, airstrips, and lodges.
There is a plan to establish another game reserve in the Tana Delta and to develop a tourist circuit connecting Kora Game Reserve to Meru National Park in the north.

The conflict between human activities and wildlife interests have been recorded. Conflicts between the Pokomo and wildlife occur extensively during dry seasons when the animals move towards the Tana River. These do cause depredation on crops and injury and death to livestock and people by elephants and buffaloes (Rep. of Kenya 1980). Other species which destroy crops include waterbuck, zebra, warthog and hippopotamus. Such destructions mostly without compensation have hardened people's attitudes towards wildlife. A very significant factor in the preservation and conservation of wildlife is the awareness and appreciation of the people of the area. It has been observed that the general attitude of the people to wildlife has been that of indifference, with people not knowing why wildlife is preserved (Rep. of Kenya 1980).

Also, the establishment of the game reserves and Tsavo National Park have taken up part of the pastoralist's grazing land (Allaway 1979).

Moreover, proposed development plans involve intensive ranching operations which are inherently sedentary in nature. Unlike the livestock grazing practice of pastoralists, intensive ranching would disrupt wildlife movements, a factor that would likely lead to drastic declines in their numbers (Trent-Bunderson 1981).

Studies (Wargute in prep.) indicate that though poaching and environmental factors (e.g droughts) are responsible , habitat destruction and encroachment as a result of human activities such as farming is partly to blame for reduction in numbers, densities and range of most of wildlife species over the years. The same is also evident even within agricultural categories (livestock versus arable agriculture) whereby the pastoral livestock faces the danger of their numbers and range being reduced due to irrigation and ranch development.

3.0-CONCLUSION

Conflicts between agriculture and wildlife are expected to continue. Increasing human population will continue to demand more potential agricultural land to be put under food production to sustain human survival. This therefore places the existence of wildlife in jeopardy. As much as it is desirable to increase acreage under food crop to feed the burgeoning human numbers, it is also fair to suggest that wildlife have the right to exist. To this end, a compromise to harmonize the existence of wildlife and agriculture side by side should be sought. The concept of multiple land use can be applied to address such conflicts with proper and integrated planning and that the rangelands still have the potential to be managed for both livestock and wildlife on a sustained yield basis and for the betterment of the people who reside in these areas (Ottichilo and Mwendwa 1986).

4.0-RECOMMENDATIONS

To ease the landuse conflicts between agriculture and wildlife the following are considered necessary:

1) Wildlife corridors be establish within the irrigation Schemes and farmlands to allow wildlife access to the Tana River during dry seasons.

2) Allow nomadic pastoralists limited access to game reserves (for controlled grazing) during times of extreme weather conditions (e.g drought) under supervision from wildlife personnel. This is a flexible way of integrating conservation with traditional land use practices.

3) Compensate or mitigate farmers for losses suffered as a result of wildlife damage. This emphasizes the need for goodwill and tolerance from the people living near wildlife parks and reserves, i.e soften people's attitude towards wildlife and lessen hostility.

4) The concept of multiple landuse [redacted] be employed where necessary.

5) Establishment and implementation of grazing blocks for pastoral livestock and ranching should be attempted. This with proper planning and assistance from the government and other financial and technical institution will help reduce overgrazing and hence competition for resources with wildlife.

6) Important wildlife habitat should have continued protection from human influence.

7) Dig more but dispersed wells and surface dams.

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MAP OF KENYA SHOWING THE LOCATION OF THE STUDY AREA (SHADED)

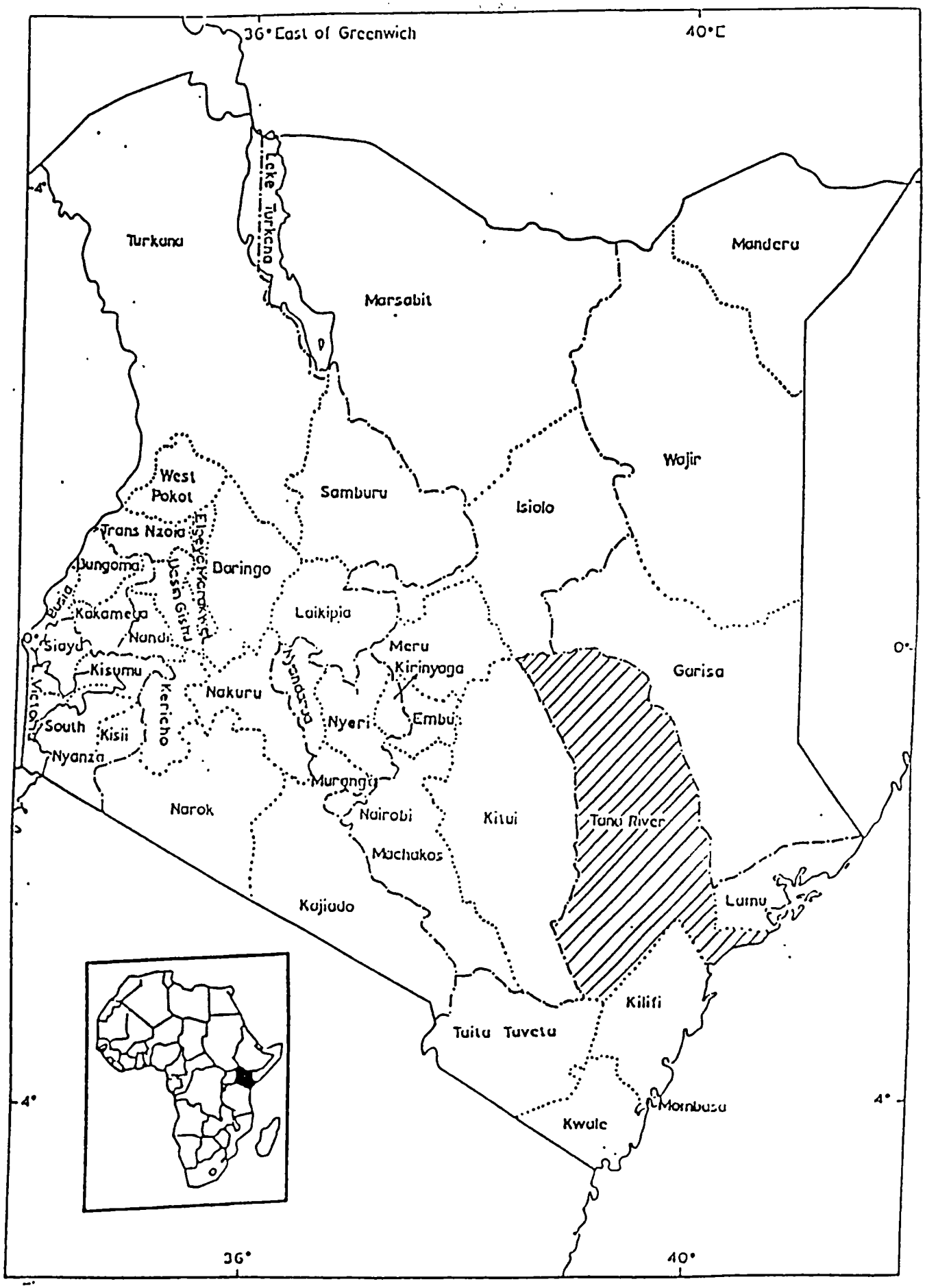
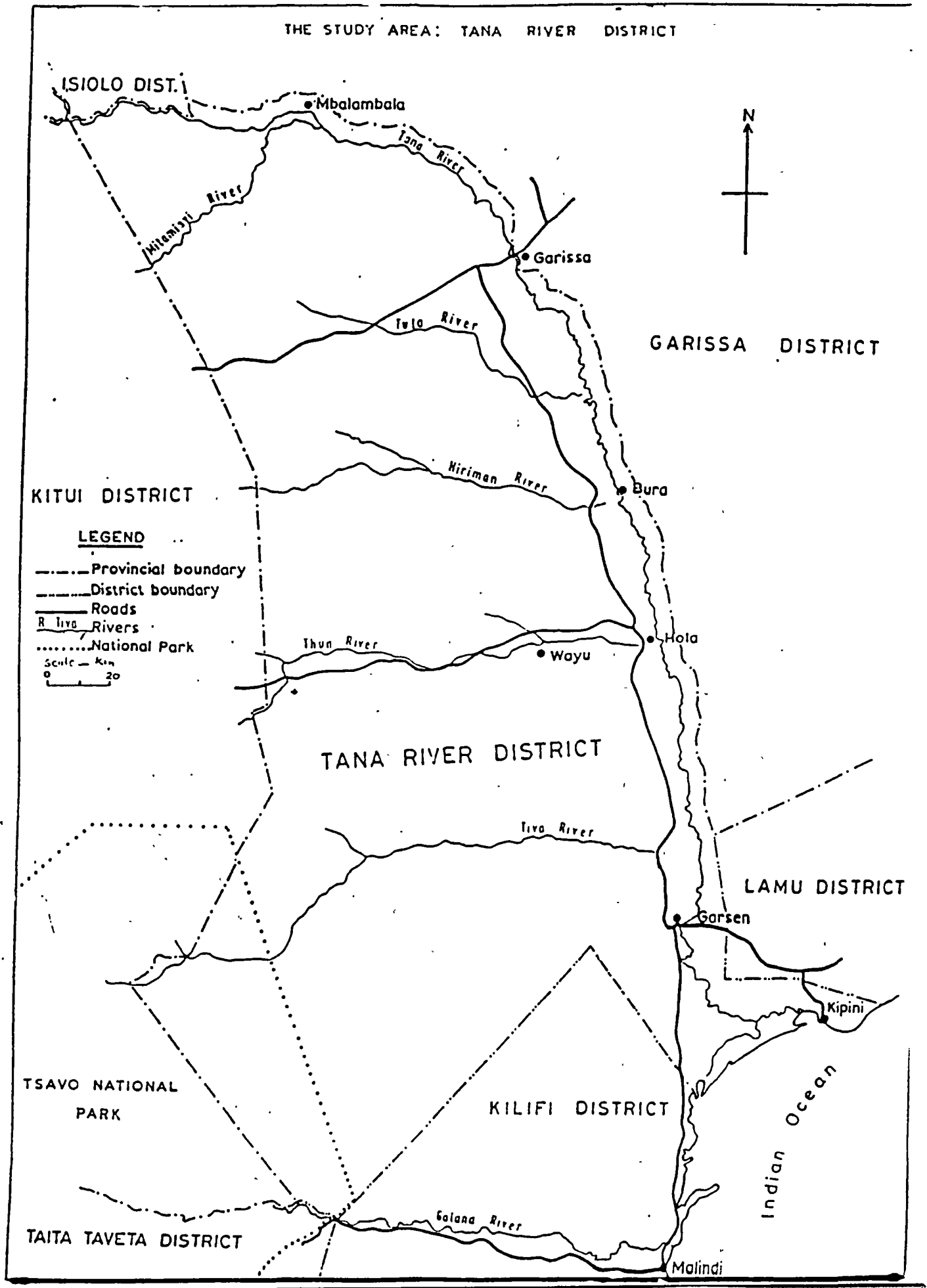
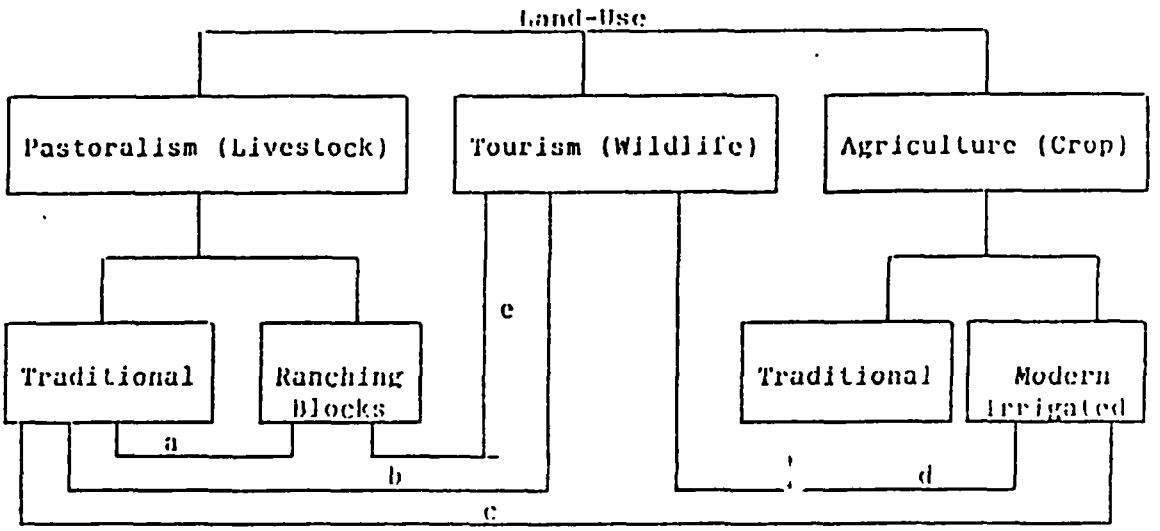


Figure 1.


THE STUDY AREA: TANA RIVER DISTRICT
ISIOLO DIST.
Mbalambala
Tana River
Hitamisyi River
Garissa
Tula River
GARISSA DISTRICT
Hiriman River
Bura
KITUI DISTRICT
LEGEND
Provincial boundary
District boundary
Roads
R Tiva Rivers
National Park
Scale — Km
0 20
Thun River
Wayu
Hola
TANA RIVER DISTRICT
Tiva River
LAMU DISTRICT
Garsen
Kipini
TSAVO NATIONAL PARK
KILIFI DISTRICT
Indian Ocean
Galana River
TAITA TAVETA DISTRICT
Malindi
N
Source: Allaway 1979



a - Ranching Versus Traditional Pastoralism - ranching reduces grazing range for pastoral use.

b - Traditional Pastoralism Versus Wildlife - competition for resource use

c - Traditional pastoralism Versus Modern Irrigated Agriculture - irrigation reduces range for pastoral use

d - Wildlife Versus Modern Irrigated Agriculture - irrigation reduces range for wildlife use

e - Ranching (blocks) Versus Wildlife - ranching reduces range for wildlife use

Figure 3: Land-use Types and Conflicts

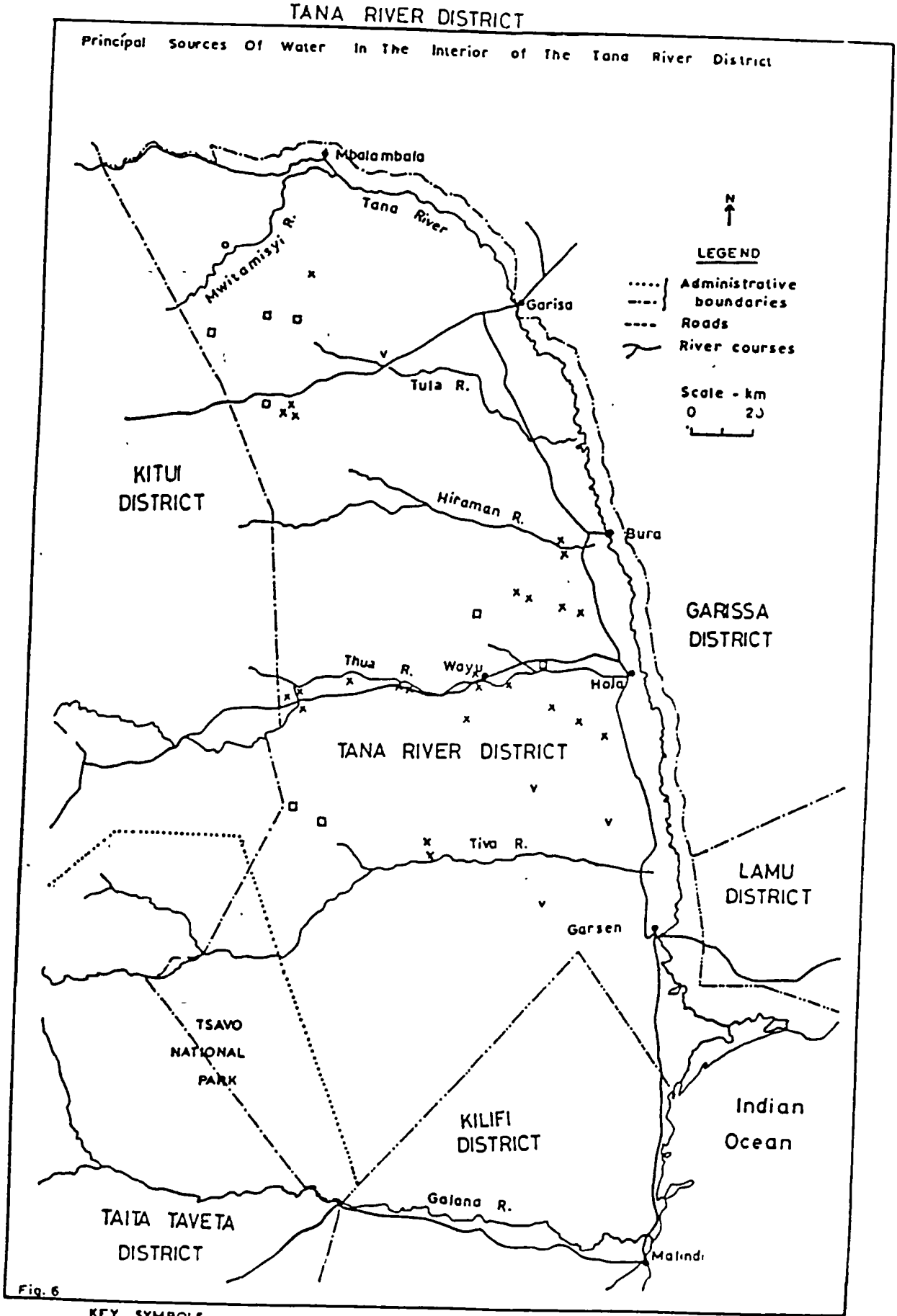


Fig. 6

Figure 4

APROXIMATE LOCATION OF PEOPLE AND TRIBES IN THE STUDY AREA

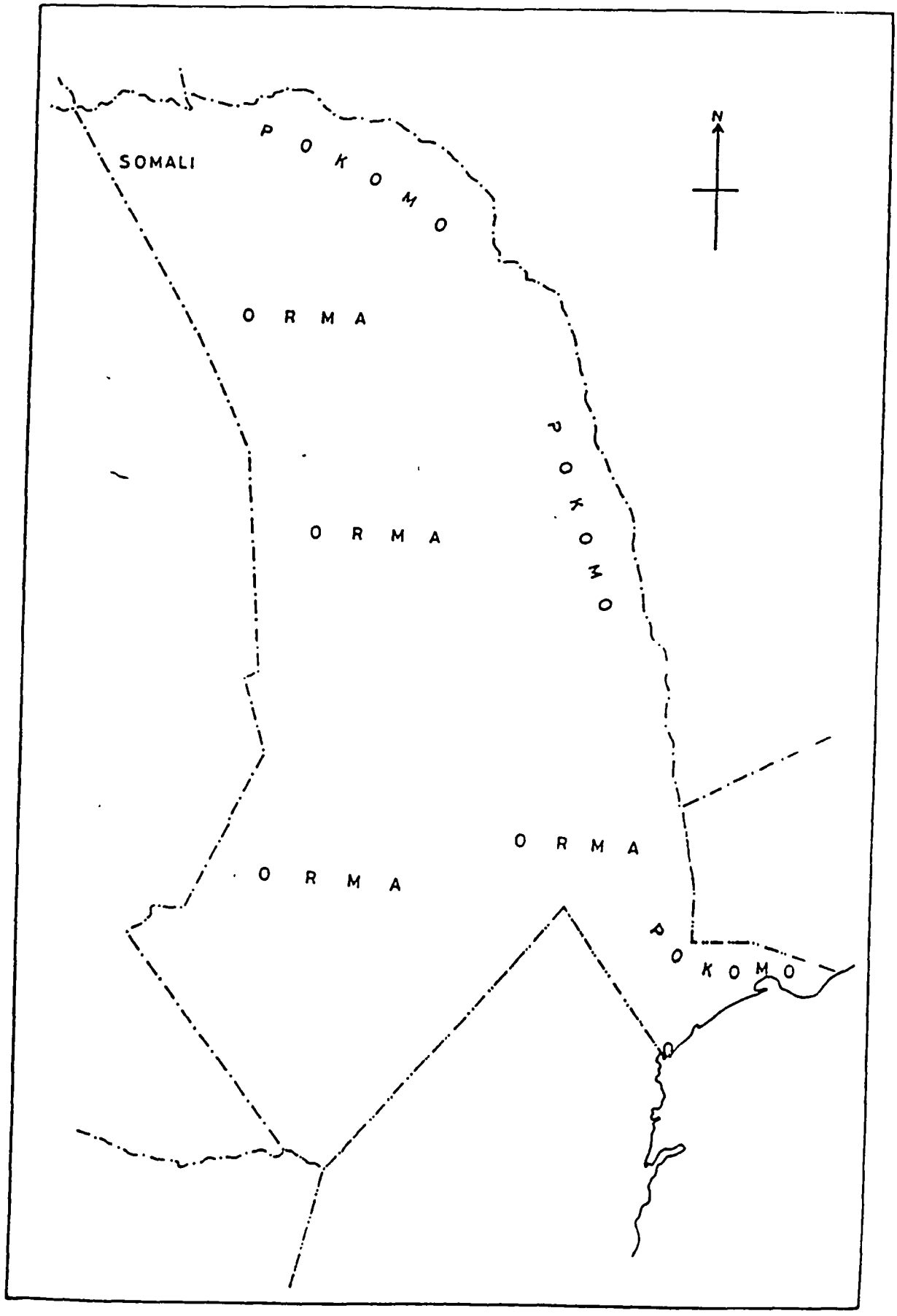


Figure 5

SEASONAL MOVEMENT OF LIVESTOCK

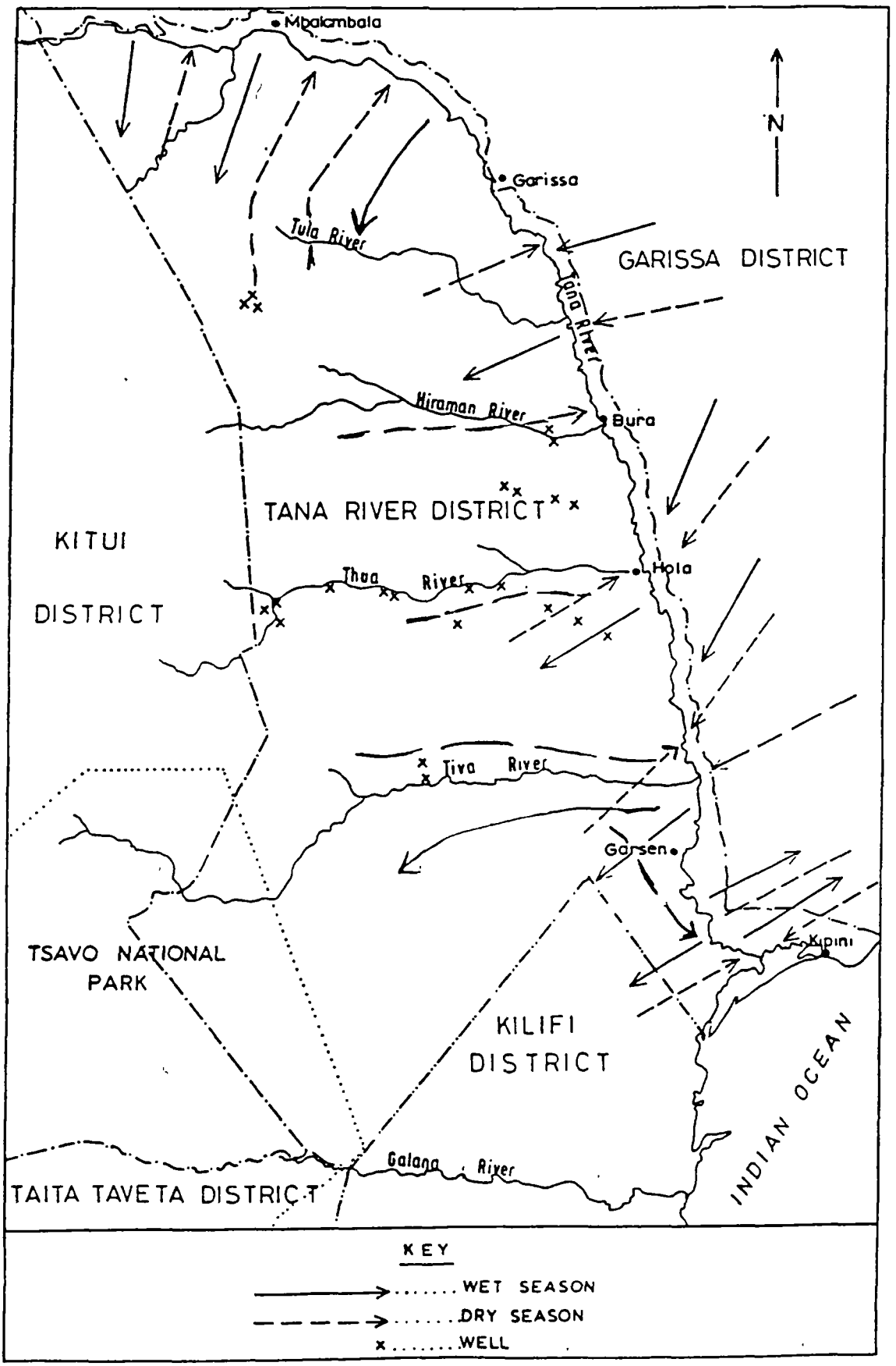
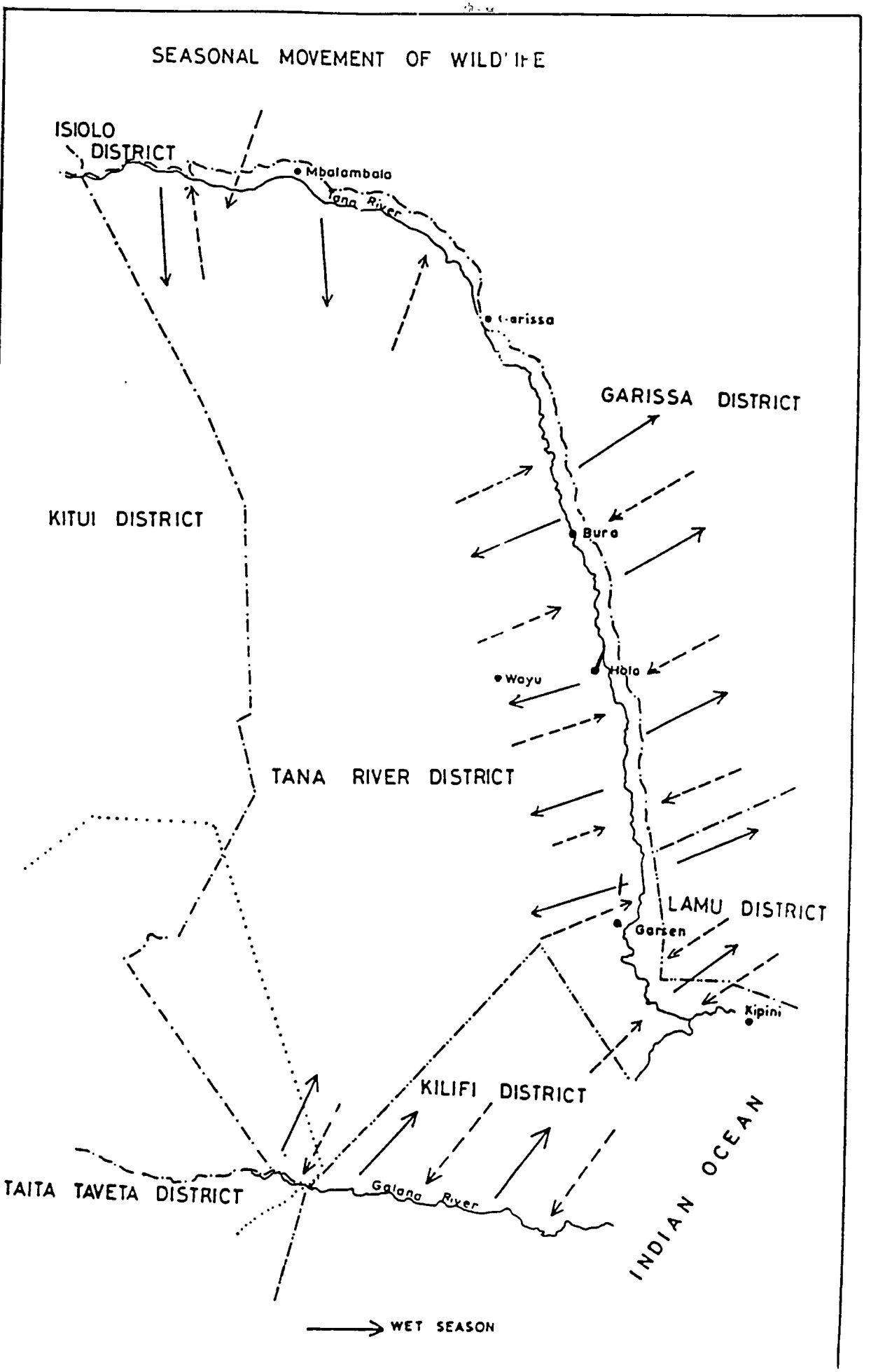
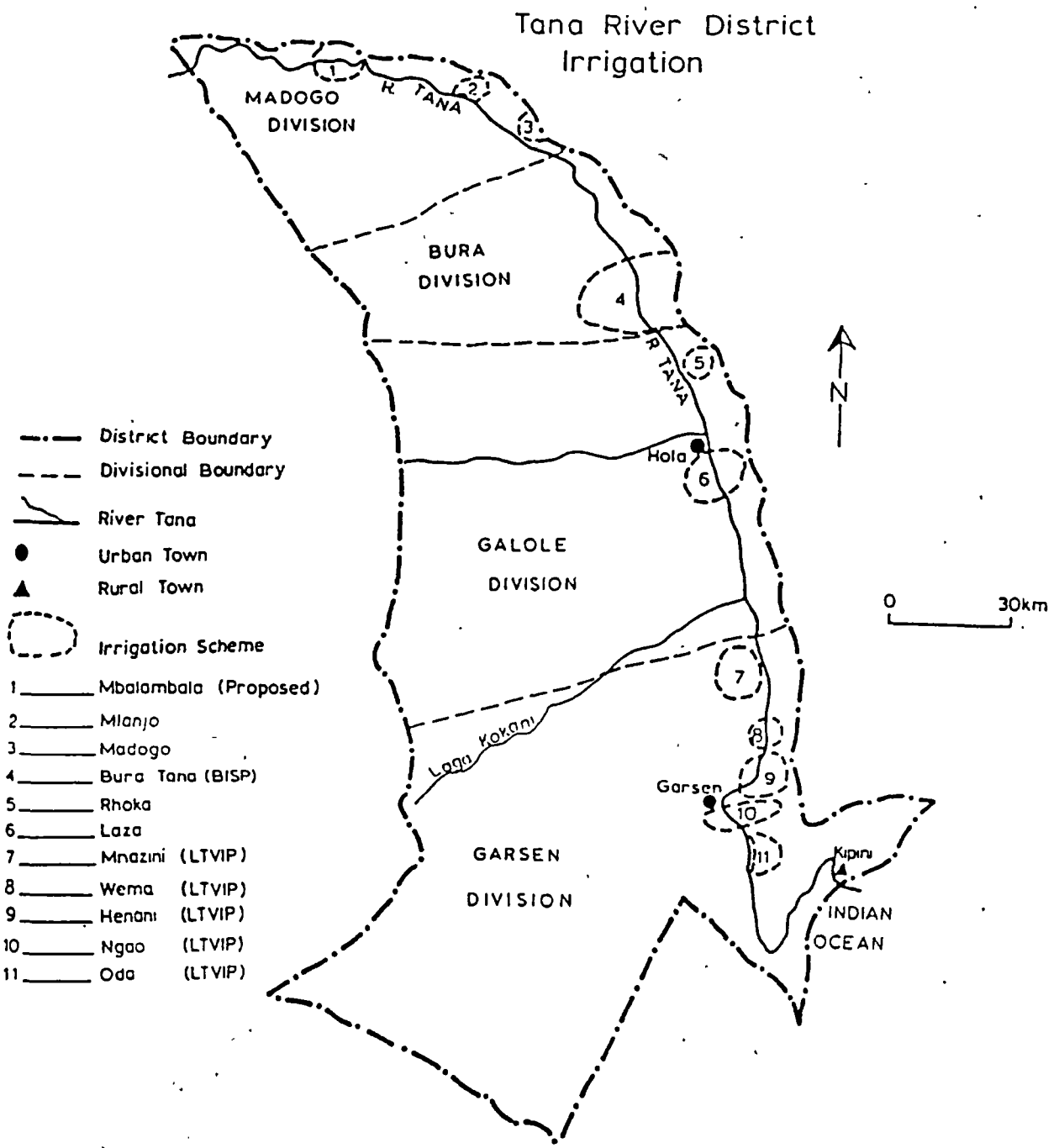


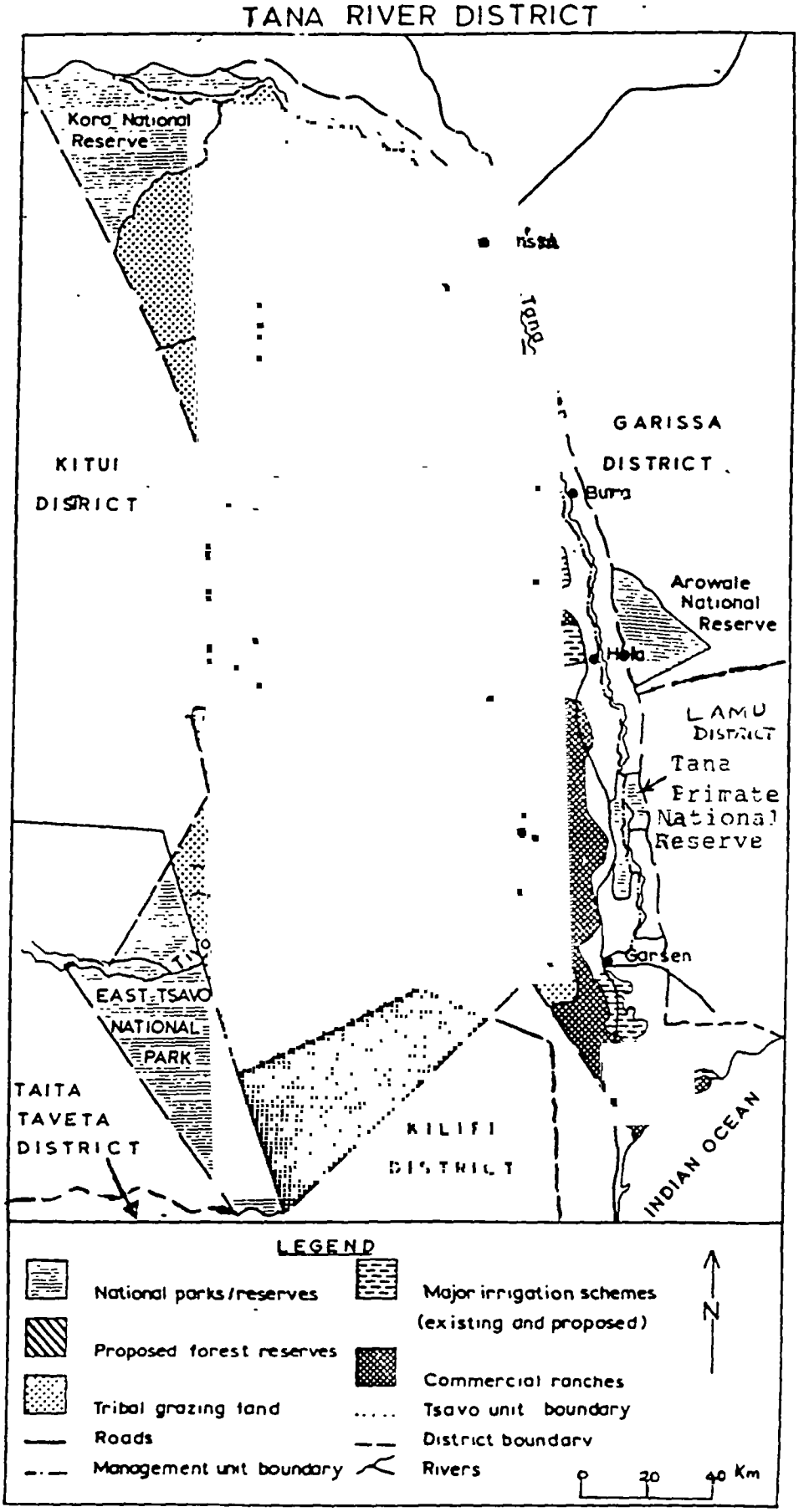
Figure 6a


SEASONAL MOVEMENT OF WILDLIFE
ISIOLO DISTRICT
Mbalambala
Tana River
Garissa
GARISSA DISTRICT
KITUI DISTRICT
Bura
Wayu
Hola
TANA RIVER DISTRICT
LAMU DISTRICT
Garsen
Kipini
KILIFI DISTRICT
INDIAN OCEAN
TAITA TAVETA DISTRICT
Galana River
WET SEASON



Ficure 7

Source: Tana River District Development Plan 1989



Distribution of land use in Tana River District

Figure 8

Table 1a

National Demographic Dimensions

Year	1962	1969	1979
Population (in Millions)	8.6	10.9	16.1*
Rate of Increase	3.0	3.3	3.8

Source: National Development Plan, 1989.

* Adjusted for underestimation.

Table 1b

National Population Estimates 1979-1993

Year	1979	1988	1990	1993
Population	16.1	22.7	24.4	27.2

Source: National Development Plan, 1989.

Table 2

Human Population Census Results for Tana River District, 1962-1979

Year	1962	%	1969	%	1979	%
Ethnic Group						
Total Population	29502	100	50696	100	92401	100
Pokomo/Riverine	20338	69	29124	57	32539	35
Orma	5946	20	15610	31	30607	33
Mijikenda	720	2	1758	3	2488	3
Doni/Sanye	550	2	835	2	225	0.2
Somali	143	0.5	518	1	10402	11

Source: Ministry of Finance and Economic Planning (1964; 1970).
Ministry of Finance and Planning (1981).

Table 3: Major Wild Herbivore Species in Tana River District

Elephant
Rhinoceros
Giraffe
Burchell's Zebra
Grevy's Zebra
Thomson's Gazelle
Grant's Gazelle
Kongoni
Impala
Topi
Hunter's Hartebeest
Buffalo
Eland Ostrich
Warthog
Oryx
Lesser kudu
Waterbuck
Bushback
Generuk

Table 4: Ranches In Tana River District

Name	State	Type of Ownership	Size (ha)	# of Shareholders	SU
Ida-Sa Godana	O	Co-operative	51,000	100	5,100
Wachu	O	D.A.C	32,000	300	3,200
Kitangali	O	Private	20,000	100	2,000
Giritu	O	D.A.C	42,000	300	4,200
Kondertu	O	D.A.C	20,000	300	2,000
Dalu	O	Church support	20,000	-	2,000
Haganda	SO	Private	12,000	50	1,200
Mpongwe	NO	D.A.C	40,000	300	4,000
Wayu	NO	D.A.C	60,000	300	6,000
Jembe	NO	D.A.C	50,000	100	5,000
Galana*	O	Private	607,000	11	6,070

Source: District Range Office Tana River District

*- Part (about 28,000) of this Ranch is in Kilifi District.
O- Operational
SO- Semi-operational
NO- Non-Operational
D.A.C- Directed Agricultural Company
SU- stock Unit, One SU equals 500 Kg (a cow and a calf).The Stocking Rate of a ranch can be obtained considering one stock unit to 10 ha.