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KENYA SOIL SURVEY

PRESENT LAND USE TYPES OF KILIFI DISTRICT (COAST PROVINCE)

by

Achieng N.Mallo

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1. INTRODUCTION

During a seminar organized by Kenya Soil Survey/Land Evaluation Section (July 1983) the need to have present land use maps on district basis (in line with the "District Focus for Rural Development") was felt necessary. The seminar participants placed much emphasis on the production of maps that can show the different types of smallholder mixed cropping/farming because this is the most widely practiced type of farming in Kenya.

In this report therefore an inventory of the existing different types of land use (here called "Present Land Use Types") as at October 1983 has been made for Kilifi District as a follow up of the seminar. It is expected that this land use inventory together with other inventories (soil, climate, vegetation, etc) will serve as a basis for proper land use planning and detailed research in future.

2. LOCATION, AREA AND POPULATION

Kilifi District is situated in Coast Province. It stretches from latitude 2°15'S to 4°S and longitude 39°05'E to 40°15'E. It is bordered by Tana River District in the north, Taita Taveta District in the west, the Indian Ocean in the east, and Kwale and Mombasa Districts in the south.

The total area of Kilifi District is 12523 km². Out of this, 8510 km² (69%) is low potential land suited mainly to stock raising and/or wildlife management. Medium potential land covers 2470 km² (20%) and only 1040 km² (8%) is high potential land receiving more than 100 mm of average annual rainfall. Lands of undetermined potential account for about 394 km² (3%) of the district (after Ojany and Ogendo, 1973).

Table 1 below shows the population per division and other related statistical figures on Kilifi District.

Table 1: POPULATION DATA OF KILIFI DISTRICT (after CBS 1969 and 1979 census)

	AREA IN Km ² 1969	TOTAL POP. 1979	NUMBER OF HOUSEHOLDS 1979	POP. DENSITY
Central Division	586	679058	18404	135
Nothern Division	3300	65437	21708	19
Southern Division	1115	151544	21708	136
Malindi Division	7497	105806)		14
Kilifi Township	7	5866)	24885	838
Malindi Township	18	23275)		1293
<hr/>				
Total Kilifi Dist	12523	430986	76741	34

The total population of Kilifi District during the 1979 census was 430986 constituting 76741 households. The table shows a population density ranging from fourteen people per square kilometre in the Malindi Division (excludes Malindi Township) to 1293 people per square kilometre in the Malindi Town. Based on an annual growth rate of 3.4% the projected population for 1983 is about 493,000.

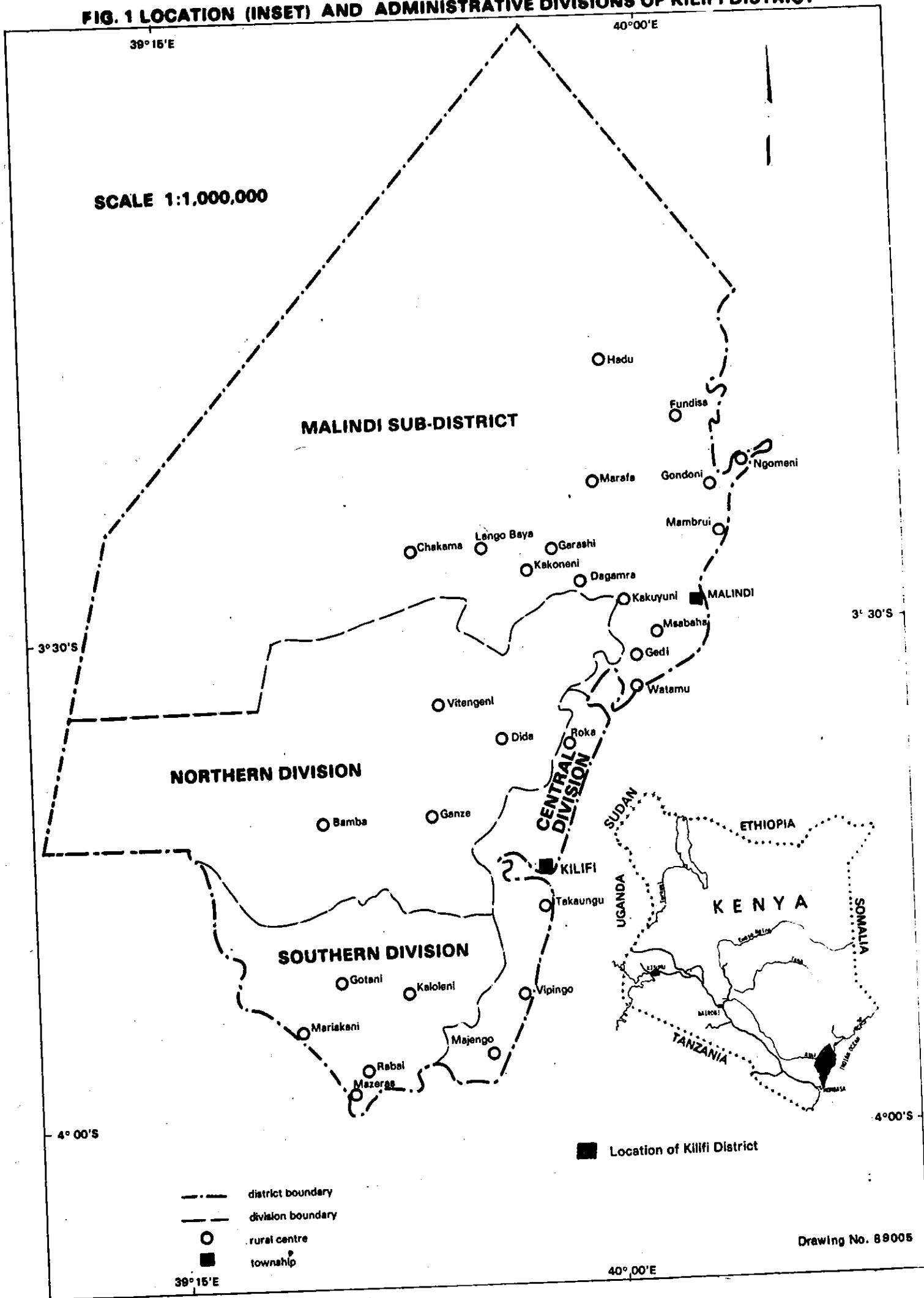
3. METHODOLOGY

The approach or method followed by the survey team in this study is set out in the "ITC Lecture Bulletin no. RSN 9 by Kannegieter 1981" and in the "KSS Lecture Note No. LN39" (entitled "Airphoto interpretation for Land Use and Agriculture" and "Land Use Classification Systems and their relevance to Kenyan conditions").

Both publications employ a survey methodology whereby the interpretation of aerial photos and landsat imagery supplemented by some fieldwork provide large amounts of fairly accurate data needed for mapping of land use. The two publications have also categorized different land use classes on the basis of the World Land Use Classification System (World Land Use Commission, 1949). In this (WLUC) system the following nine categories have been identified for land use mapping:-

1. Settlements and associated non-agricultural lands
2. Horticulture
3. Tree crops and other perennial crops
4. Cropland
5. Improved permanent pasture (managed or enclosed)
6. Unimproved grazing land
7. Woodlands
8. Swamps and marshes (fresh and saltwater)
9. Unproductive land

FIG. 1 LOCATION (INSET) AND ADMINISTRATIVE DIVISIONS OF KILIFI DISTRICT



Other publications that were reviewed are indicated in chapter 6. By the end of the review, information gathered included the area extent (hectares) of the district and its administrative divisions, topographical maps and aerial photographs, major crops grown, types of animals kept, climatic conditions and population statistics.

Other office methods involved the interpretation of black and white aerial photographs flown in 1967 at a scale of 1:50,000. The land use categories or units detected on the aerial photographs were delineated onto topographical maps (scale 1:50,000) which were later used as base maps during fieldwork. Fieldwork was carried out during the month of October 1983. In the field, observation sites were chosen according to land use changes but mainly along the road. Boundaries of the preliminary APl units were confirmed or rectified where changes in land use were apparent. Not all parts of the district could be reached due to wet weather conditions (impassable roads) and shortage of enough funds for fieldwork. Places like Kaloleni (Southern Division), Galana Ranch and Adu Location were not reached and therefore have been mapped on the basis of aerial photo interpretation, previous reports of the area and verbal information from people who have worked there before. The final map was derived from a compilation of a base map from TARDA (Tana and Athi River Development Authority) map no. 11 at scale 1:250,000 annotated with land use boundaries from the reduced 1:50,000 APl maps.

4. THE PRESENT LAND USE TYPES

4.1 The Previous work

General information on the present land use types in Kilifi District is shown in the National Atlas of Kenya (Republic of Kenya 1970, scale 1:3,000,000), the World Atlas of Agriculture (Committee of WAA, 1976, scale 1:5,000,000), Land Use Mapping of Kenya using Remote Sensing Techniques (Agatsiva and Mwendwa 1982, scale 1,000,000), Farm Management Handbook of Kenya (Jaetzold and Schmidt, 1983, scale 1:250,000), Land Use Zones of the Kilifi Area (Waaijenbergh, in de Meester et al, in prep, scale 1:500,000).

More detailed information on specified areas of the district can be obtained from van de Weg and Sombroek (1976) who give a preliminary assessment of soil conditions in Marafa-Magarini area; Achieng (1983) who has given the land use mapping units of the Magarini Settlement Scheme, in An Assessment of the soil conditions of the Magarini settlement scheme by Muchena et al; Khalif (1982) who wrote the Range Management Annual Report for 1982 in Malindi Division and Riyamy (1982) who also wrote the Agricultural Annual Report for 1982 in Malindi Division of Kilifi

District.

Other information can be obtained from the Training Project in Pedology (1979) by the Agricultural University, Wageningen, The Netherlands and from the Land Use Mapping Project (1983) by the Japan International Cooperation Agency, Japan.

4.2 General characteristics of the present land use

The major divisions of land usage in Kilifi District can be classified as:-

Land used for crop cultivation only
 Land used for crop cultivation mainly (i.e. over 50% of the mapping unit is under crops) plus grazing (i.e. less than 50% of the mapping unit is under grazing).
 Land used for grazing mainly (i.e. over 50% of the mapping unit is under grazing) plus crop cultivation (i.e. less than 50% of the mapping unit is under crops)
 Land used for grazing only (ranching schemes)
 Land under dry coastal forest
 Land under mangrove forest
 Areas under marine national parks and reserves
 Areas under water bodies

Some of the major divisions of land usage are further subdivided into a number of subdivisions based on percent cultivation and type of enterprises (for cropland) and type of ranch ownership (for ranching schemes).

A description of the major divisions and subdivision of land usage in Kilifi District is given below.

4.3 Description of the present land use types

4.3.1 Land used for crop cultivation only

4.3.1.1 Map symbol C1

This land use mapping unit coincides with an area under sisal growing (Vipingo Sisal Estate). It is found along the main road from Mombasa town to Kilifi town around Vipingo Market centre. Over 95% of the unit is under large scale cultivation of sisal (Agave sisalana). The remaining 5% of the unit is occupied by infrastructure (roads, factor buildings, market and labour camps).

4.3.1.2 Mapping symbol C2

The minor irrigation schemes that occur in Kilifi District fall under this land use mapping unit. Some of the irrigated plots occupy acreages which are not mappable at the scale of this map (1:250,000). Those plots occupying mappable acreage include

Sabaki Irrigation Scheme, Chakama Irrigation Scheme, Burangi Rice project and Jilore Irrigation Scheme. The last three schemes were not operational at the time of this survey for various reasons mainly floods (Jilore Scheme, Burangi Scheme) and poor management (chakama Scheme). Sabaki Irrigation Scheme was in operation and the following crops were being grown.

<u>Crop</u>	<u>Hectares</u>
Tomatoes	3.5
Cabbages	0.5
Bringals	0.25
(egg plants)	
Capsicum	0.15

Apart from the above irrigated crops the rest of the unit C2 is either under fallow (grazed) or under rainfed crops (coconuts, maize, sugarcane, fruits such as mangoes, citrus, watermelons and pawpaw).

4.3.2 Land used for crop cultivation mainly plus grazing

4.3.2.1 Map symbol CG1:

The unit includes some of the oldest settlement schemes in Kilifi District such as Tezo Roka Settlement scheme. It is found just north of Kilifi Town on the main road to Malindi. Between 70 and 80 percent of the unit is cultivated with cashew nuts, coconuts, cassava, maize, cowpeas and simsim. The uncultivated portions of the unit are grazed by both indigenous and exotic cattle.

4.3.2.2 Map symbol CG2

Most of southern Division of Kilifi District is under this unit. No observations were made in this unit but information gathered from other sources indicate that 70-80 percent of the unit is cultivated. The major crops grown are coconuts, cashew nuts, fruits, cassava, pulses and maize. The rest of the unit (20-30%) is under natural grazing lands and a few pastures. The main animals kept on these grazing lands are cattle and goats.

4.3.2.3 Map symbol CG3

This unit is found along river Mtomkuu. Between 60 and 70 percent of the unit is cultivated. The major crops grown are maize and cotton. Unlike CG1 and CG2 which are dominated by tree crops CG3 is dominated by maize. Thirty to forty percent of the unit is under grazing mainly by cattle and goats.

4.3.2.4 Map symbol CG4

This unit runs along the coastline in the southern part of Kilifi District. The road between Shimo La Tewa and Kilifi Town forms the boundary with unit C1 while the Indian Ocean borders it in the east. About 50 to 70% of the unit is cultivated. The major crops grown are coconuts, cashew nuts, maize, simsim, cassava and fruit crops. This unit has the greatest number of fruit crops, the main ones being mangoes, bananas and citrus. About 30-50% of the unit is occupied by both nucleated settlements (Mtwapa Market, Majengo market, Kikambala centre) and scattered settlements (beach hotels, dwelling homes). Around the settlements small holder grazing is practiced. A few farmers have constructed zero grazing units for grade cows through the Smallholder Dairy Expansion Project.

4.3.2.5 Map symbol CG5

This unit represents the type of farming found within five kilometers of Kilifi Town to the north of Kilifi creek. Just as unit CG4 between 50 and 70 percent of its area is cultivated. It is also characterized by both nucleated settlements (Kilifi Town) and scattered settlements (dwelling homes). But unlike CG4 which is dominated by coconuts, the main crop here is cashew nuts. This may be due to the presence of a cashew nut factory in this unit. The other crops grown are coconuts and maize. Cattle grazing on both improved and unimproved grasslands is also done by the smallholder farmers in this unit.

4.3.2.6 Map symbol CG6

This unit is found along the coastline between Roka centre and just beyond Malindi town. A small patch of the unit is also found on Mwanagea Hill. Just as the preceding two units, this unit is 50 to 70% percent cultivated. But unlike these two units, this unit is mainly dominated by mango trees. Mango trees are a feature of almost every homestead in this unit. The other crops grown are cashew nuts, maize, pawpaw, coconuts and cassava. In addition to the above common crops grape fruits are also grown in this unit at Kisiwani ADC Farm. Over 600 cattle are also kept on this farm under improved grazing and feeding systems. Cattle on smallholder farms around are kept under semi-improved grazing pastures.

More than half of the uncultivated portion of this unit is occupied by nucleated settlements such as Malindi town, Gede centre, Watamu centre, Msabaha centre, Ganda Market, Kakuyuni shops, etc. The scattered settlements in this units include some of the most progressive farms in Kilifi District such as Retief's "Kijiwetanga Farm" and Menyhart's "Gede Farm".

4.3.3 Land used for grazing mainly plus crop cultivation

4.3.3.1 Map Symbol GC1

This unit lies in a transition zone between the high rainfall zones of the coastal belt and the drier ranching zones of Kilifi District. It stretches from Kakoneni in the north to Vitengeni in the south.

The giant Sabaki water Supply pipeline traverses this unit and provides a possibility for future irrigation development on farms along the pipeline. At present rainfed cultivation of cashew nuts, cassava, maize and pineapples is done on about 30 to 50 percent of the unit. The main activity here however is livestock grazing which is done on over 50 percent of the unit. The animals kept include local goats and zebu cattle.

4.3.3.2 Map symbol GC2

This unit lies in agro-climatic zone III (semi-humid). Although this unit lies in a zone which favours the growth of most crops and intensive cultivation only 30 to 50 percent is cultivated. The most commonly grown tree crops of Coast Province - coconuts and cashew nuts are the main crops grown in this unit. The rest of the unit accounting for 50 to 70% percent is under grazing/browsing. Browsing is prominent here because most of the unit is bushland (some portions are thickets) without grass. The main animal types found here are local goats and zebu cattle.

4.3.3.3 Map symbol GC3

Apart from G2 and G6 this is one of the most expansive units in the survey area. Like GC1 it lies in a transition zone between the high potential lands of the coastal belt and the low potential ranching zones of Kilifi District. The largest patch of the unit is found in the lower drainage zone of Rare river. The only other patch is situated between Sabaki river and Koromi river within Garashi and Dagamra locations. There is a proposal by the Tana and Athi Rivers Development Authority to develop part of this unit in Garashi and Dagamra locations into an irrigation scheme.

At present 20 to 40 per cent of this unit is under rainfed cultivation and the main crops grown are maize, cassava, cashew nuts and coconuts. The remaining 60 to 80% of the unit is under grazing. The main animal types kept are zebu cattle and local goats.

4.3.3.4 Map symbol GC4

Most of this unit is within Magarini Settlement Scheme. It is found to the north of Sabaki river between Hadu and unit GC3. The area under cultivation is very small (only 10 - 30%). Although the area under cultivation is small the number of crops

grown by local farmers are many - sorghum, maize, pigeon peas, green grams, cassava, mangoes, cashew nuts and millet. This may be due to the influence of the Magarini General Investigation Station which grows several types of crops on its trial plots and harvests encouraging yields. These yields impress local farmers who in turn respond by trying the crops on their farmers. The area under grazing accounts for 70-90% of the unit. The main animals kept are goats, the common breeds being the galla goat and the small East African goat. They provide goat meat and skin. The other animals found in this unit are zebu cattle which provide some milk in addition to beef and skin. The Magarini General Investigation Station also trains some of the cattle and sells to local farmers as draught animals. This oxen training programme is expected to help in increasing the area under cultivation in this unit.

4.3.3.5 Map symbol GC5

This unit represents the type of farming found to the immediate north of Sabaki bridge. It also includes the bushy Ngomeni peninsula. It is similar to GC4 since both have same percentage area under cultivation i.e 10 to 30%. However they differ in the number and type of crops grown. While GC4 has eight different crops GC5 has only five major crops namely coconuts, simsim, maize, cotton and sweet potatoes. Compared to the rest of Kilifi District, unit GC5 has the highest concentration of simsim and it is the only unit in which cotton was encountered growing (flowering stage) at the time of the survey. Seventy to ninety percent of the unit is under bush, grass, bare and settlements. The bushy part of the unit is used for cattle and goat rearing. It is also exploited for multi-purpose wood. The bare portions are mainly found along the coastline and are used for recreation and sand works. The settlements are Mambrui, Marikebuni, Gongoni, Ngomeni, Fundisa and scattered dwelling homes.

4.3.3.6 Map symbol GC6

This unit at the northern tip of Kilifi District plus unit G3 together make up an administrative unit called Adu location. Adu location occupies the northern tip of Kilifi District and lies in a fairly hot to very hot semi-arid zone whose production potential is limited to livestock rearing and drought resistant crops. Consequently the main crops grown in unit GC6 are local maize, cassava and millet. And the area under cultivation is less than ten percent of the unit. The main animals kept are local goats and zebu cattle.

4.3.4 Land used for grazing only (ranching schemes)

4.3.4.1 Map symbol G1

This unit is mapped as "private individual ranching scheme". It is known locally as "Kilifi Plantations". This ranch is private property. It is situated between Takaungu centre and Kilifi creek. It has over 2,000 heads of improved dairy cattle (Aysrshire/sahiwal crosses). At the moment it is the main supplier of grade dairy cows to small scale dairy farmers along the coastal belt.

4.3.4.2 Map symbol G2

This unit coincides with the area under "private company ranching scheme". This type of ranching scheme is similar to G1 in that all of them are private property but they differ in two ways:-

- a. Size and ownership G1 occupies a small area owned by an individual while G2 occupies a large area owned by several people (<50 members)
- b. Grazing system and type of enterprise - G1 practices a rather intensive grazing system (high stocking rate) of improved dairy cattle while G2 is under extensive grazing (low stocking rate) of unimproved livestock and wildlife (game ranching)

Examples of G2 are Giriama ranching scheme and Galana Game and Ranching Scheme. The latter is the largest ranch established in Coast Province and about 371,700 hectares of it are within Kilifi District. The rest 505,100 hectares fall in Tana /river District. Giriama ranch has an area of 25,938 hectares and a membership of 50 people. It has some of the best ranch development facilities such as dips, developed water sources (Giriama Dam) and a World Bank loan which was granted as part of the Second Livestock Development Project (SLDP). Most of Galana ranch is under wild game (eland, zebras, elephants, warthogs, ostriches, etc plus some 22,000 local cattle, 1200 sheep and 300 camels. Giriama ranch keeps local cattle only.

4.3.4.3 Map symbol G3

This unit is under two ranching schemes which are partly directed or run by Kenya government through the Ministry of Agriculture and Livestock Development. This is why it is called "Directed Agricultural Company Ranching Scheme". Examples are Laga Buna Ranch and Kilifi Ranch.

Laga Buna Ranch takes the shape of a triangle and is situated at the northern tip of Kilifi District. It measures about 18,000

hectares. Kilifi Ranch measures about 42,000 hectares and is found at the south western corner of Kilifi District.

Both ranches were dormant at the time of this survey. This is because the ranches had not been registered despite the efforts by the directors. During the survey several local cattle were seen grazing together with a few wild animals (mainly antelopes).

4.3.4.4 Map symbol G4

This ranching scheme falls in the category of company ranches and is jointly owned by Agricultural Development Corporation and Kilifi County Council. It is locally known as Kulalu Ranch. It is situated to the western part of Kilifi District south of river Sabaki. It occupies an area of about 90,000 hectares under lease for 45 years from 1978.

Kulalu Ranch has over 22,000 heads of beef cattle. More than half of the cattle are pure boran while the rest are crosses. It is one of the most successful ranches in Kilifi district with facilities like firebreak system, developed water sources, 5 spray races and ready market (Kenya Meat Commission, ADC butcheries, etc.).

4.3.4.5 Map symbol G5

This unit is a ranching scheme run under the cooperative Act, Ministry of Cooperative Development. Examples of these types of ranches are Msumarini ranch (26,000 hectares) in Malindi Division and Bale ranch in Northern Division.

Both ranches were not operational at the time of this survey because they had applied for lease from the Commissioner of Lands but had not received replies. However Msumarini ranch has 754 cattle (of which 742 is members' stock) 6543 goats (of which 6529 is members' stock), 524 sheep (all members' stock) and Ksh1200 in the bank.

4.3.4.6 Map symbol G6

Most of Kilifi District is low potential land unsuitable or marginally suitable for arable farming. Ranching is therefore perceived as one of the best forms of land use. Consequently the Kenya government (through the Ministry of Agriculture and Livestock Development, Cooperative Development, etc.) is encouraging inhabitants of the drier parts of Kilifi District to organize themselves into groups and form ranches (hence called group ranching schemes).

The main aim of forming group ranches is to pool together and provide services like water, veterinary services, marketing, transportation, etc to neighbouring livestock farmers. Examples of group ranches formed or being formed as a result of this government effort are Mariakani ranch (18,000 hectares),

Kayafungo (10,720 hectares, Dola ranch (21,065 hectares), Birya ranch (15,400 hectares), Mnagoni ranch (13,560 hectares), Mapotea ranch (23,400 hectares), Chakama ranch (51,938 hectares) Weru ranch (12,900 hectares), Wachifa ranch (27,600 hectares) Bungale ranch (28,715 hectares).

Except for Chakama ranch and Weru ranch all the other group ranches are dormant due to lack of finance. The major types of animals kept in these ranches are cattle (local zebu), goats and sheep.

4.3.5 Land under dry coastal forest

4.3.5.1 Map symbol DF

This unit is confined to Arabuko-Sokoke forest. It is the largest forest in coast province measuring about 42,000 hectares. The area under the forest is gazetted and consists of both indigenous and exotic (planted) trees. The main indigenous tree species are Brachyleana hutchinsii (Muhuhu) and Afzelia quensensis (Mbambakofi). The former tree species is used for carvings and firewood while the latter is a hardwood providing timber for making of furniture. The main planted tree species are Casuarina equisetifolia and Eucalyptus camadulensis.

4.3.6 Land under Mangrove Forest

4.3.6.1 Map symbol M

All the coastal tidal areas which fall within Kilifi District are mapped under this unit as Mangrove Forest (swamp). They include Ngomeni area, Kilifi creek, Mida creek etc. Only Ngomeni area is mapped, the latter two are not mappable at the scale of this map. The total area under mangrove swamps in Kilifi District is about 6340 hectares. There are several tree species of the mangrove type within these swamps used mainly as building poles, firewood etc. Some parts of the mangrove swamps are being cleared for the construction of salt ponds (by Fundisa Salt Works) and fish ponds (by Ngomeni Aquaculture Project).

The latter project is being implemented by the Fisheries Department and executed by the Food and Agriculture Organization (FAO) under the auspices of the United Nations Development Programme (UNDP). The proposed area for the project is 50 hectares though only 12 hectares have so far been utilized comprising of eight large ponds and a small one.

4.3.7 Land under Marine National Parks and Reserves

4.3.7.1 Map symbol P

Watamu and Malindi Marine National Parks and Reserves are mapped under this unit. This unit is found along the coastline and

extends from just south of Malindi town to Mida creek around Watamu Tourist Centre. The parks are mainly used for tourism. In fact most of tourist visits to Kenya's coast are concentrated along Malindi and Watamu beaches. Kilifi District therefore makes a significant contribution to the tourist industry and earns a lot of foreign exchange for Kenya.

4.3.8 Areas under water bodies

4.3.8.1 Map symbol W

This unit includes Lake Baratumu, Lake Jilore, Lake Sameta, Lake Chem Chem, River Sabaki and several seasonal rivers viz Laga Buna, Rare, Ndzovuni, Sinawe (Wimbi), Mto Mkuu, Tsalu and Kombeni. The Indian Ocean part that falls within Kenya is also included in this unit.

Most of these water bodies are used to provide water for livestock and domestic purposes (Lake Jilore, Lake Baratumu, Lake Chem Chem, Lake Sameta, and all the rivers). The Indian Ocean, Lake Sameta and Lake Jilore provide most of the fish eaten in Kilifi District.

Table 2: PRESENT LAND USE TYPES OF KILIFI DISTRICT

C Crop cultivation only

- C1 over 95% of the unit is cultivated (Vipingo Sisal Estate)
Crop: sisal
others: settlement (labour camps)
- C2 80-90% of the unit is cultivated (mainly irrigated)
Crops: coconuts, maize, vegetables, fruits and sugarcane
others: bare soil

CG Mainly Crop cultivation with Grazing

- CG1 70-80% of the unit is cultivated
crops: cashew nuts, coconuts, cassava, maize, cowpeas, simsim
livestock: cattle
- CG2 70-80% of the unit is cultivated
crops: coconuts, cashew nuts, cassava, maize, fruits, pulses
livestock: cattle, goats
- CG3 60-70% of the unit is cultivated
crop: maize, cotton
livestock: cattle, goats
- CG4 50-70% of the unit is cultivated
crops: coconuts, cashew nuts, maize, simsim, cassava, fruits (mangoes, bananas, oranges) livestock: cattle
others: settlement (Mtwapa, Majengo, Kikambala)
- CG5 50-70% of the unit is cultivated
crops: cashew nuts, coconuts, maize

- livestock: cattle
 others: settlements (Kilifi town)
 CG6 50-70% of the unit is cultivated
 crops: mangoes, cashew nuts, maize, pawpaw, coconuts,
 cassava
 livestock: cattle, (exotic, crosses, zebu)
 others: settlements (Malindi, Gede, Watamu, Msabaha, Ganda,
 Kakuyuni)

GC Mainly Grazing with Crop cultivation

- GC1 30-50% of the unit is cultivated
 crops: cashew nuts, cassava, maize, pineapples
 livestock: local goats, zebu cattle
 GC2 30-50% of the unit is cultivated
 crops: coconuts, cashew nuts
 livestock: zebu cattle, local goats
 GC3 20-40% of the unit is cultivated
 crops: maize, cassava, cashew nuts, coconuts
 livestock: zebu cattle, local goats
 GC4 10-30% of the unit is cultivated
 crops: sorghum, maize, pigeon peas, green grams, cassava,
 mangoes, cashew nuts, millet
 livestock: galla goats, small East African goats, zebu
 cattle
 GC5 10-30% of the unit is cultivated
 crops: coconuts, simsim, maize, cotton, sweet potatoes
 livestock: zebu cattle, local goats
 GC6 less than 10% of the unit is cultivated
 crops: maize, cassava, millet
 livestock: local goats, zebu cattle

G Grazing only (ranching schemes)

- G1 private individual ranching scheme
 livestock: cattle (exotic/local zebu crosses)
 example: Kilifi Plantations
 G2 private company ranching scheme
 livestock: cattle (local zebu), wild game, sheep and camels
 examples: Giriama Ranch, Galana Ranch
 G3 directed agricultural company ranching scheme
 livestock: cattle (boran and the small East African zebu)
 examples: Laga Buna Ranch and Kilifi Ranch
 G4 agricultural development cooperation/county council ranching
 scheme
 livestock: pure boran, crosses
 example: ADC Kulalu Ranch
 G5 cooperative ranching scheme
 livestock: goats, cattle (local zebu), sheep
 examples: Msumarini Ranch, Bale Ranch
 G6 group ranching scheme
 livestock: cattle (local zebu), goats (small East African

goat), sheep (local types)
 examples: Mariakani Ranch, Kayafungo Ranch, Dola Ranch,
 Biryaa Ranch, Mnagoni Ranch, Mapotea Ranch, Chakama Ranch,
 Weru Ranch, Wachifa Ranch, Bungale Ranch, Marafa Ranch

- DF Dry coastal forest (predominantly used for timber and building poles)
- DF Arabuko Sokoke Forest
 Tree spp. - local (eg Brachyleana hutchinsii, Azelia quensis)
 - exotic (e.g. Casuarina equisetifolia)
- MF Mangrove Forest (mainly for poles, timber, salt fields and fish culture projects)
- MF Ngomeni/Fundisa Project Area
 Tree spp. - local mangrove forest species
 Salt fields - Fundisa Salt Works
- P Mainly Marine National Parks and Reserves used for tourism and nature preservation
- P Watamu/Malindi Marine National Parks and Reserves
- W Water bodies and seasonal swamps mainly used for fishing and provision of water for livestock and domestic purposes
- W Lake Jilore, Lake Chem Chem, Lake Baratumu, Lake Sameta, River Sabaki etc.

5. LIST OF PEOPLE CONSULTED

- | | | |
|-----|----------------|---|
| 1. | C.N. Mugo | DAO, Kilifi District |
| 2. | A.M. Riyamy | AAO, Malindi subdistrict |
| 3. | M. Khalif | Assistant Range Officer, Malindi Subdistrict |
| 4. | D. Kengo | Assistant Range Officer, Bamba Division |
| 5. | S. Jilani | Locational Extension Officer, Kakoneni, Kilifi District |
| 6. | P. Kivindyo | Range Assistant, Kakoneni, Kilifi District |
| 7. | J. Warui | Range Assistant, Marafa, Kilifi District |
| 8. | Peterson | Complex Manager, ADC Kulalu Ranch, Box 673, Malindi. |
| 9. | Willy Angira | Ranch Accountant, Giriama Ranch, Kilifi District |
| 10. | B.M. Bhaittah | Forester in Charge, Arabuko Sokoke Forest |
| 11. | C. Munguti | DO, Malindi subdistrict |
| 12. | L. Menyhart | P.O. Box 350 Malindi |
| 13. | A. Jamillah | Home Economics Officer, Malindi |
| 14. | Muchiri | Agronomy section, Magarini settlement scheme Malindi. |
| 15. | Clement Mungai | Agronomy section, Magarini Settlement Scheme, Malindi. |

6. REFERENCES

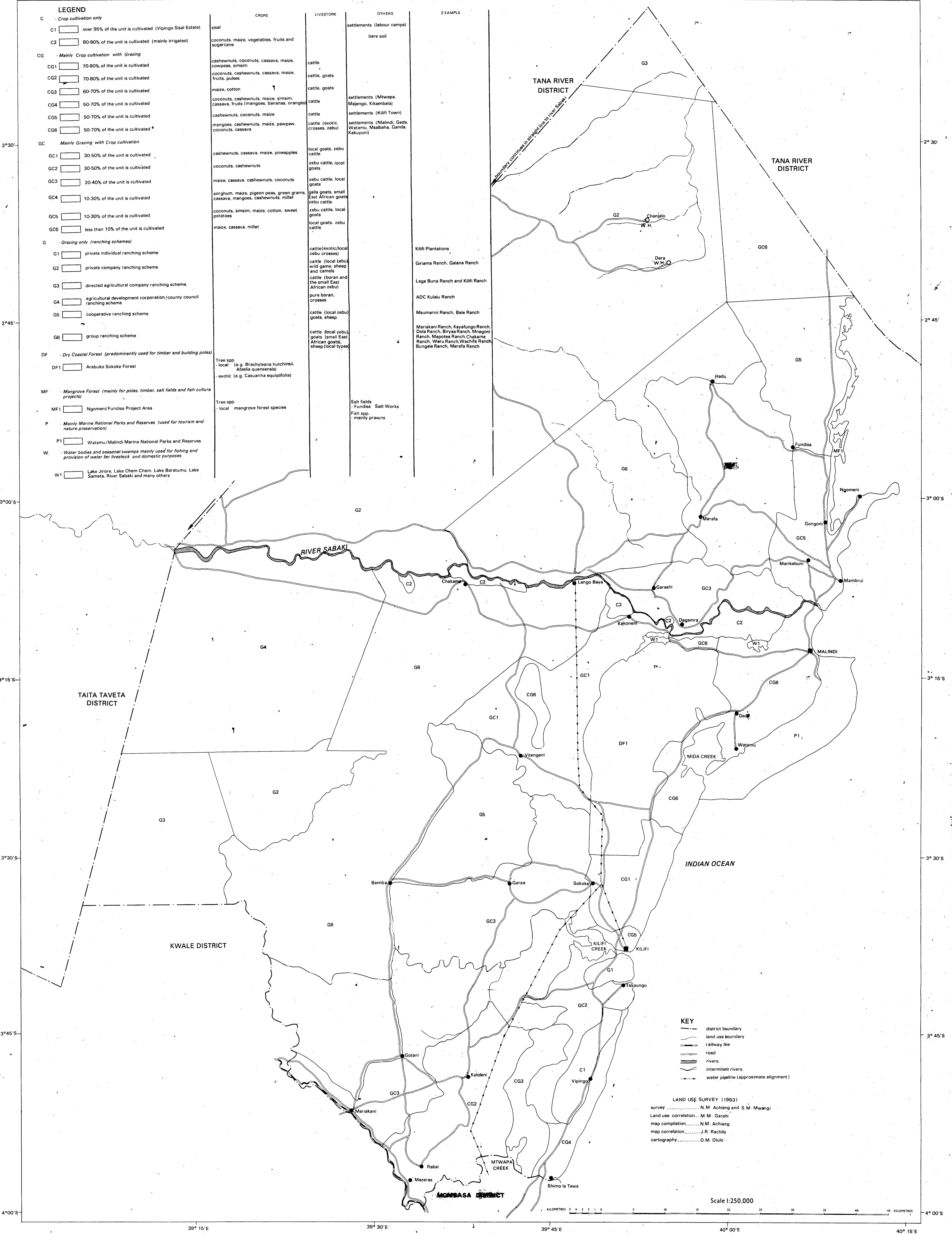
- Achieng, N.M.,
1981 Land use classification systems and their relevance to Kenyan conditions, K.S.S. lecture note no. 39, Nairobi, Kenya
- Agatsiva and Mwendwa,
1982 Land Use Mapping of Kenya using remote sensing techniques, KREMU report no. 72, Nairobi, Kenya
- Central Bureau of Statistics (CBS),
1969 and 1979 Population census of Kenya Volume 1, Ministry of Economic Planning and Development, Nairobi, Kenya
- Committee for the World Atlas of Agriculture,
1976 World Atlas of Agriculture volume 4, IGDA, Novara, Italy
- Jaetzold, R. and Schmidt,
1983 Farm Management Handbook of Kenya volume II part c, Ministry of Agriculture, Nairobi, Kenya
- Japan International Cooperation Agency (JICA),
1983 Report no 2, JICA, Nairobi, Kenya
- Kannegieter, T.,
1982 Airphoto Interpretation for Land Use and Agriculture, ITC Bulletin no. RSN9, Enschede, The Netherlands
- Khalif, M.,
1982 Range Management Annual Report for 1982 (Malindi Division - Kilifi District) Ministry of Livestock Development, Kenya.
- Muchena, F. N. et al.,
in prep An assessment of the soil conditions of the Magarini Settlement Scheme (Kilifi District) KSS Site Evaluation Paper no P63 Nairobi, Kenya
- National Environment and Human Settlements Secretariat,
1984 Kilifi District Environment Assessment report no DP7, Ministry of Environment and Natural resources, Nairobi, Kenya
- Ojany F. and Ogendo R.,
1973 A study in Physical and Human Geography
- Republic of Kenya.,
1970 National Atlas of Kenya, Survey of Kenya, Nairobi, Kenya
- Republic of Kenya
1982 National Food Policy, Government of Kenya Sessional Paper no 4, Nairobi,

Kenya

- Riyamy, A.M.,
1982 Agricultural Annual Report for 1982
 (Malindi Division - Kilifi District),
 Ministry of Agriculture, Nairobi, Kenya
- Tana and Athi River Development Authority (TARDA), Resource
1983 Development Proposals for Kilifi
 District, TARDA report, Nairobi, Kenya
- Waaijenbergh, H. in de Meester et al., Land Use Zones in the in
prep Kilifi Area. In Soils of the Kilifi
 area, KSS Reconnaissance report no. R11,
 Nairobi, Kenya
- van de Weg R.F. and Sombroek, W.G., Soil conditions of the
1976 Marafa Magarini area (Kilifi District),
 KSS site evaluation paper no. p30,
 Nairobi, Kenya
- World Land Use Commission of FAO., A report of the Commission
1949 on World land Use Surveys, International
 Geographical Union (IGU), FAO
 Publication, Rome, Italy

PRESENT LAND USE MAP OF KILIFI DISTRICT (1983)

Appendix 1 to report No M28



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