Bombali District, Sierra Leone: A geography of underdevelopment.

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Bombali District, Sierra Leone: A Geography of Underdevelopment.

by

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ABSTRACT

The study of Bombali district is a modest effort at explaining the geography of a relatively underdeveloped part of Northern Sierra Leone. The environment is briefly described and some evidence is found concerning the early administrator's views about the district's development potential (ChapterI). The nature of the labour unit of production (the extended family) is examined; some socio-economic restraints to increased productivity stem from this production factor (Chapter II).

Systems of land use and tenure reflect these restraints, the impact of motor roads and the reluctance of early administrators to deal with the conflict between the landless nomad and indigenous shifting cultivator(Chapter lII). Provincial land laws remain unchanged and traditional, but a land market for building purposes is emerging in the larger towns of Makeni and Kamakwie.

Chiefdoms and chiefdom boundaries have had several modifications within short periods of time (Chapter IV). These administrative areas are tribal based. The location of some chiefdom centres has often changed with the death of chiefs, consequently some services are transferred to new chiefdom towns. The present forms of administrative units have little bearing upon theoretical shapes, and more permanent chiefdom towns tend to be centres of greater population concentration.

The transport network and pattern of service distribution reflect an export oriented economic system (Chapter V). Motor transportation is the principal form of communication, but this caters for a bare 35% of all farm produce to markets. The development of the road transport system is limited by two main factors: a) the defunct railway which contributed to the growth of Makeni, the district centre with no rail route to serve its hinterland, and b) the location of more important interdistrict centre roads to the far south of Bombali. Areas of main service centres are very small because of problems of access, poverty and reluctance to change.

Some chiefdom charateristics (49 variables) are analysed to assess administrative types and their levels of underdevelopment (Chapter VI). Local human responses to development are discussed (Chapter VII) and recommendations suggested for development in the district (Chapter VIII).

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INTRODUCTION

The Northern Area of Sierra Leone forms one of the least documented administrative divisions of the country. As most development priorities for future decades will be concerned with rural environments there is a need to study the geography of Northern Sierra Leone which is predominantly rural. Indeed Bombali district, which forms part of this Northern Area, has only one main town - Makeni (12,304 in 1963) - and a smaller one - Kamakwie (3,572 in 1963). The majority of the working population of this district is peasant farmers who own the land, yet the recently settled Fullah herdsmen contribute over 25% of the country's beef supplies. The development problems one faces in the district are both physical and human, and the latter seems to be more important, considering the present conflict between the farmer and the cattle herdsman.

The present government finds little justification in long term feasibility studies prior to development project implementation, anxious as it is to speed up economic growth. International investment in rural development cannot, however, materialise without some assurance concerning the viability of projects; and this assurance can only be derived from a detailed assessment of the total environment in which development takes place. The social geographer's

contribution to such a task can be substantial considering his ability to map and relate patterns of cultural, physical and economic distributions of a given area.

AIM OF STUDY

The aim of this study is to describe the grassroots of underdevelopment in a district in Sierra Leone. As a subregion of the underdeveloped Northern Area, Bombali is studied in terms of its physical, social, economic and administrative characteristics. It is thus a concise feasibility study of a predominantly agricultural district for future development planners. As most of provincial Sierra Leone tends to share common characteristics of rural underdevelopment, the study hopefully provides a basis for future studies of this nature for other parts of the country. Indeed, four of the 13 major tribes in Sierra Leone - Temne, Limba, Lokko and Susu - form the majority of the inhabitants in this district, while about 30% of all the cattle in the country come from this area.

HYPOTHESIS

The basic hypothesis in this study is that national development has to consider local environmental characteristics for meaningful economic growth to take place. In other words characteristics of underdevelopment are varied and localised, and national development is based on the

sum of all these variations. Underdevelopment then becomes a complex phenomenon describing varying rates of minimal exploitation of natural resources. An understanding of these variations is of vital importance in development planning. The assumption is that Bombali, as part of the Northern Area of Sierra Leone, is underdeveloped, but that there are local variations which can be described through a study of grassroots of underdevelopment.

DATA SOURCES:

a) Fieldwork

Much of the data in this study is the result of two years of fieldwork (1970-1971). Questionnaires were prepared and 1025 household heads were interviewed to assess local variations in: (i) the basis of land inheritance rights, (ii)the orientation of household heads towards nuclear families and (iii) attitudes towards land transfers and sales. A census survey was carried out in 10 settlements (1970) to assess the nature of rural family sizes. Court files of four Chiefdom courts were studied to assess the relationship between the extended family and traditional laws. The study of services was based on a survey carried out in 30 settlements with a population of 450 or over by 1971. The identification of some extinct settlements on the ground was carried out in 1970, through the help of 1958 air photographs for which there is a complete coverage. Current variations of land use around built-up areas

were studied and it was possible to detect tribal mixtures at settlements along local administration boundaries.

b) Historical documents

The Sierra Leone Blue Books provided scattered information concerning progress in road construction, the establishment of district centres, tribal warfare, Chiefdom amalgamation and early trends in settlement fixation. Maps on the 1925 international boundary between Sierra Leone and Guinea, as well as those on land characteristics (1950) were obtained from the Surveys and Lands Department in Freetown. Some of these maps were less informative than the 1970 topographic series and care has been taken to limit their use to the introductory chapter where it was necessary to illustrate earlier suggestions of production regions, based on partial information.

c) Research publications

Much of the information from research sources is of limited use for Bombali, but it provided useful guidelines. Some sources are of restricted use as regards coverage while others are of a general nature, treating the country as a whole. For example, Clarke's Sierra Leone in Maps (1966), Mutti's Marketing Staple Foods in Sierra Leone (1967), Hussain's study of the land tenure system (1964) and Odell and Dijkerman's Soils of Sierra Leone (1967) are general references from which some information can be gleaned. Mitra's study of costing farm productivity in the Bolilland region provided the basis for farm income analysis (1969);

Stobbs' work on the soils of the Bolilands of Sierra Leone (1963) is still an important source book on soil types in this region, while Dijkerman's case studies of land capability in parts of Bombali are useful supplements in the description of soil/slope relationships (1969).

METHODS

The aim of this study may be ambitious but the resultant efforts are a simple stepping stone because of the amplitude of the topic. Data analyses have tended to be restricted to characteristics for which fairly reliable figures have been obtained. Even at this level, care has been taken not to predict trends, and more interest is directed towards patterns of distributions. There is, for example, an apparent weakness in Chapter 7 where human obstacles to development are described without figures. The student in tropical underdevelopment studies is aware of local facts for which figures cannot be obtained with ease, yet there is no justification for omitting these facts. Figures can generate less reliable generalisations and the trends adopted in this study are part of Mitchell's suggestions on the study of land tenure systems in Sierra Leone:

> ..."We will be glad to receive local information, but it may be well to add that we are only concerned with factual statements of customs actually existing - we are concerned with what IS, not with opinions as to what OUGHT TO BE." (1964, 39).

The last part of this quotation echoes one major dilemma in underdevelopment studies - the apparent hesitation of experts foreign to given environments in suggesting measures for social change. In Chapter 8 this study braves this warning by suggesting incentives for development in Bombali.

The study starts with a systematic analysis of some geographical indicators of underdevelopment - a) the family as a labour unit of production, b) land use and tenure, c) the nature of local administrative boundaries, d) communications and basic infrastructural characteristics and e) patterns of underdevelopment. Various measures of Chiefdom shapes have been used (Chapter 4) together with Chiefdom town primacy ratios at two radii of one-mile-lengths from estimated central points of settlements. It was observed from these ratios that while settlements showed a marked range in ratio at the first one-mile-radius (1-85) that of the second was nearly five times smaller (1-18) indicating the essentially rural conditions of these local growth poles.

Simple analyses of transport networks and accessibility patterns indicate that while larger population centres have higher link demands they are not most centrally located in terms of distance measures (Chapter 5). Access to service locations therefore tends to be an important limitation to sizes of service areas. The determination of

service scores took this limitation into consideration as most services are found to be used more intensively by persons closest to their location. Patterns of underdevelopment are derived from 49 variables subjected to a Spearman rank correlation and Q-mode factor analyses (Chapter 6). Factor matrix scores were used to derive variations of chiefdoms, while a linkage analysis by grouping algorithms produced simplified patterns of chiefdom types - based on similarity in rates of underdevelopment.

Chapters 7 and 8 are mainly conclusions based on characteristics which are considered as generators of present human obstacles to development. In other words the study has attempted to generalise human attitudes by an assessment of important indicators of underdevelopment for which reliable data can be obtained. The result indicates that while there is need to speed up economic growth there is also need for some economic and social transformation in the district and the country as a whole. This transformation probably involves a less rapid process of change than is desired by government, though the common goal concerns increased economic exploitation of natural resources in Bombali.

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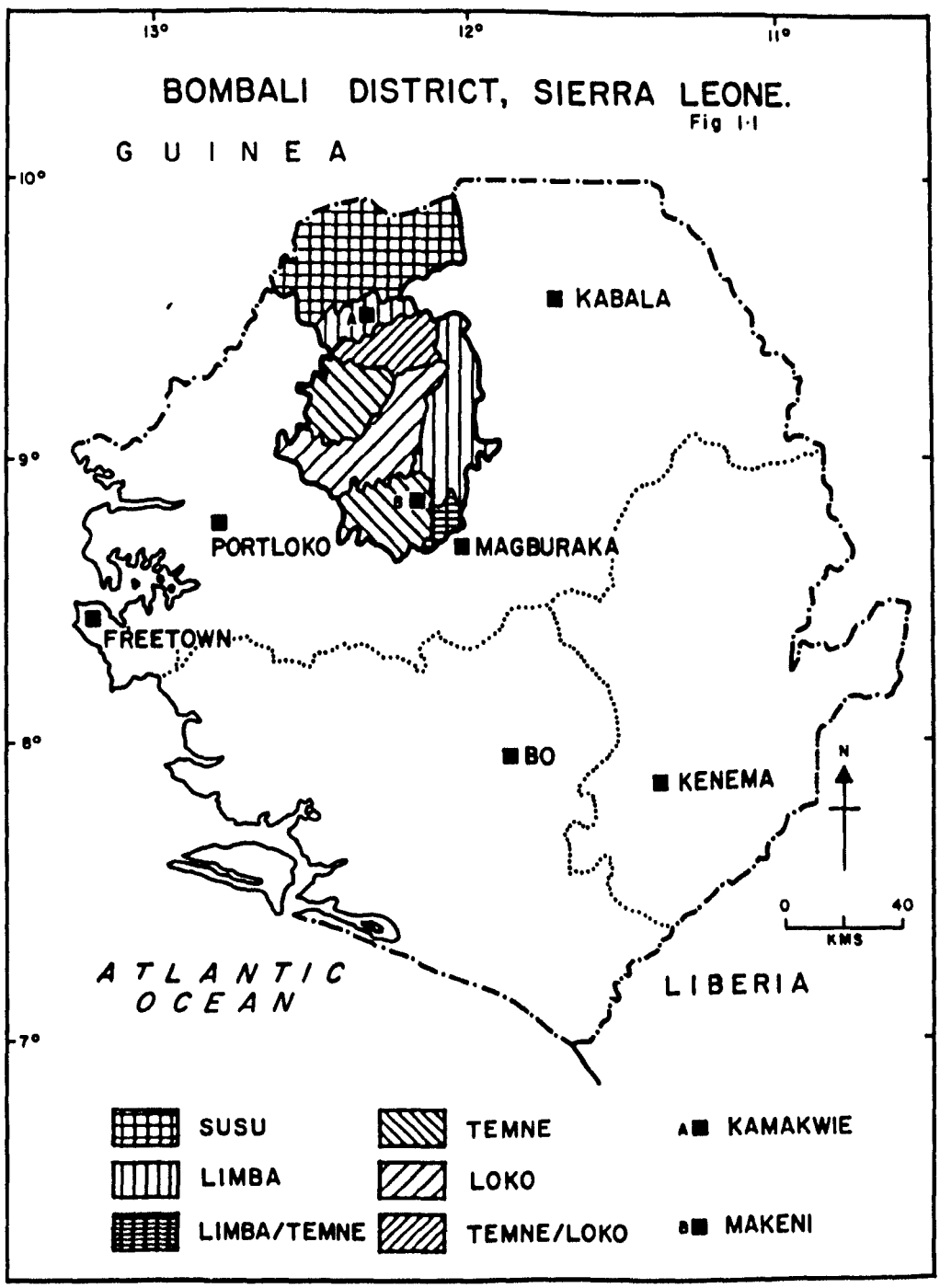

13°
12°
11°
BOMBALI DISTRICT, SIERRA LEONE.
Fig 1·1
GUINEA
10°
9°
8°
7°
KABALA
PORTLOKO
MAGBURAKA
FREETOWN
BO
KENEMA
N
0
40
KMS
ATLANTIC OCEAN
LIBERIA
SUSU
LIMBA
LIMBA/TEMNE
TEMNE
LOKO
TEMNE/LOKO
A KAMAKWIE
B MAKENI

CHAPTER I

BACKGROUND TO STUDY AREA

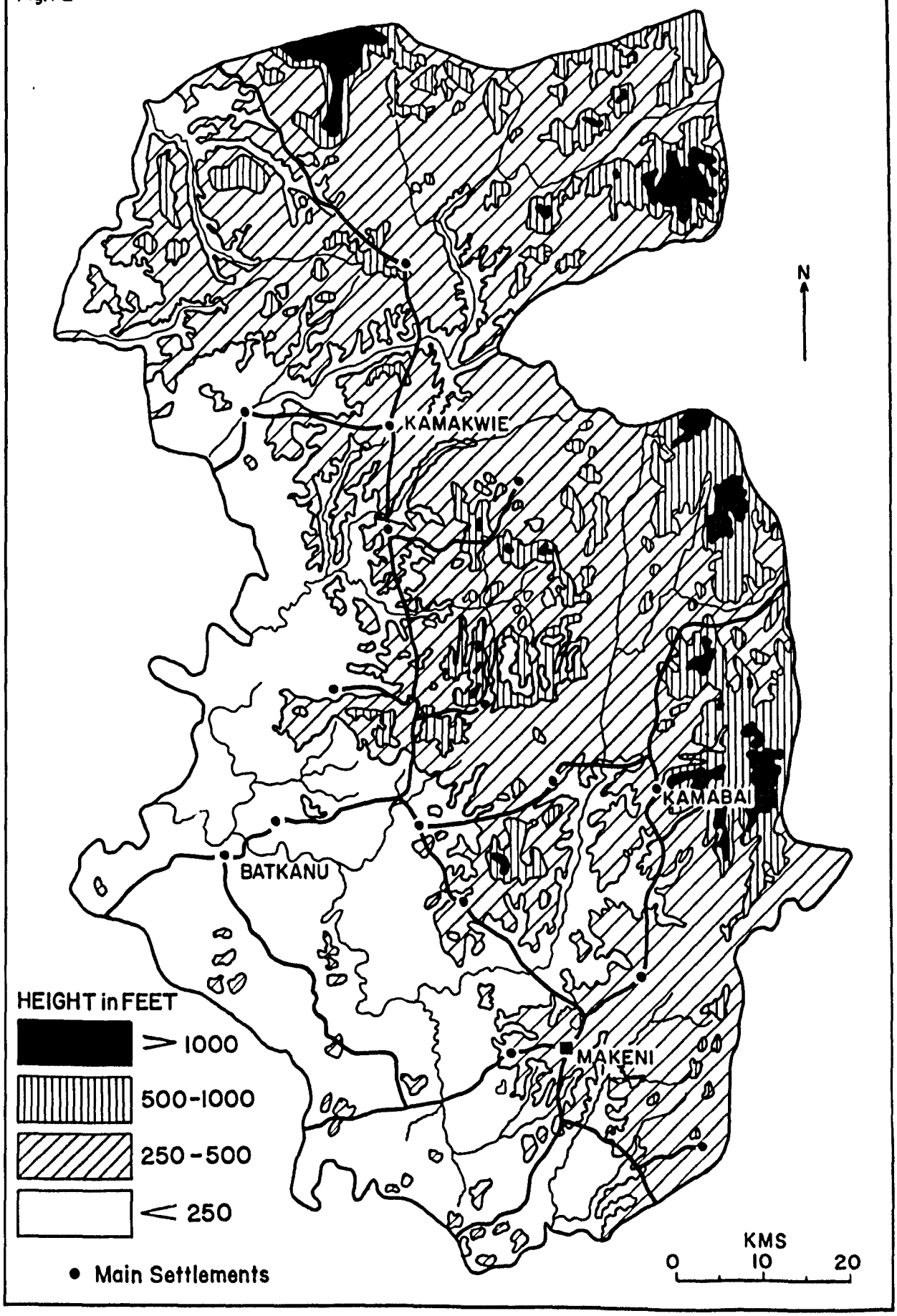
INTRODUCTION

Bombali district is a transitional region between the north-eastern hills and central lowlands of Sierra Leone. The district is fairly rectangular in shape. It stretches between latitudes 8°36′ and 9°56′ north and extends from longitudes 11°56′ to 12°31′ west. The north-central portion of the district is constricted to barely 25 miles (40·2 km.) in breadth, compared with some 55 miles (88.5 km.) to the south. Bombali accounts for nearly one-ninth of the area of Sierra Leone - 2,900 sq. miles (7,510·97 sq. km.) and one-eleventh of the country's population (198,776 in 1963).

The district is adjacent to the southern hinterlands of Guinea (Fig. 1.1) and forms a fairly important link between the two countries. Madina Oula, an important southern outpost for Guinea is about 55 miles from Kamakwie. The motor road linking Kamakwie and this outpost is an important route for Guinean goods - cattle, rice, vegetables and dyed cloths - destined for Sierra Leonean markets. Kola nuts from Bombali and manufactured goods from retail shops at Kamakwie, Makeni and Freetown are supplied to southern Guinea through this road. The trading language is Susu rather than Creole or French, as this tribe is preponderant on either side of the international boundary. Diamond mining has been a source of emigration for Guineans and the Madina Oula road is the shortest northern link to the mining areas of Southern Sierra Leone.

PHYSIOGRAPHY

Fig. 1·2



The location of Makeni, the district administrative centre, is more of a commercial advantage at a national and international level. This town has the largest commercial services in the Northern Area of the country. The extension of the Freetown/Pendembu railway to Makeni by 1912 eased accessibility to this town at a period when other settlements had no motorable roads or railways. Local commerce in the district has tended to be attracted towards Makeni, Freetown and then the mining areas. Excluding the good links Makeni has with other major centres of the country this town is near the geographical centre and mean centre of the population of the country. It is 110 miles (177 km.) from Freetown, the capital; 87 miles (140 km.) from Bo, the second largest town of the country, and other district towns like Kabala, Port Lokko and Magburaka are all less than 80 miles (128·7 km.) away, while the northern tip of the district is some 108 miles (173·8 km.) from it.

THE ENVIRONMENT

The transitional character of the district is evident in the physical landscape (Fig. 1.2). The relief is more complex than either the highlands to the east or the lowlands to the west. There are three main physiographic divides each with a north-west to south-east trend. The south-western lowlands contain tributaries of the Little Scarcies and Rokel rivers. To the north-east there are

rock outcrops at heights of over 1,000ft (304·8m). Between these two features are the central uplands ranging from 250 to 1,000ft (76·2 - 304·8m). Streams have cut deep narrow valleys from the north-east, flowing southwards until they reach the central uplands, and thence, almost at right angles, head for the lowlands to the west.

Bombali is a tropical area with climatic characteristics of seasonality, small ranges of temperatures and rainfall. The rainy season is between mid-May and mid-September when rainfall reliability is over 50%. There is an annual rainfall range of 95 inches (2,413mm.) at the northern part of the district to 125 inches (3,175mm.) to the south. Temperatures are within 78°F (25·6° C) and 90°F (32·2° C.) throughout the year, and yet the straight line distance from north to south is some 60 miles (76·5 km.). Vegetation is of secondary bush, grading to savanna and grass in most places. With extensive cultivation, nomadism and uncontrolled bush fires, much of the original forest has been reduced to grassland.

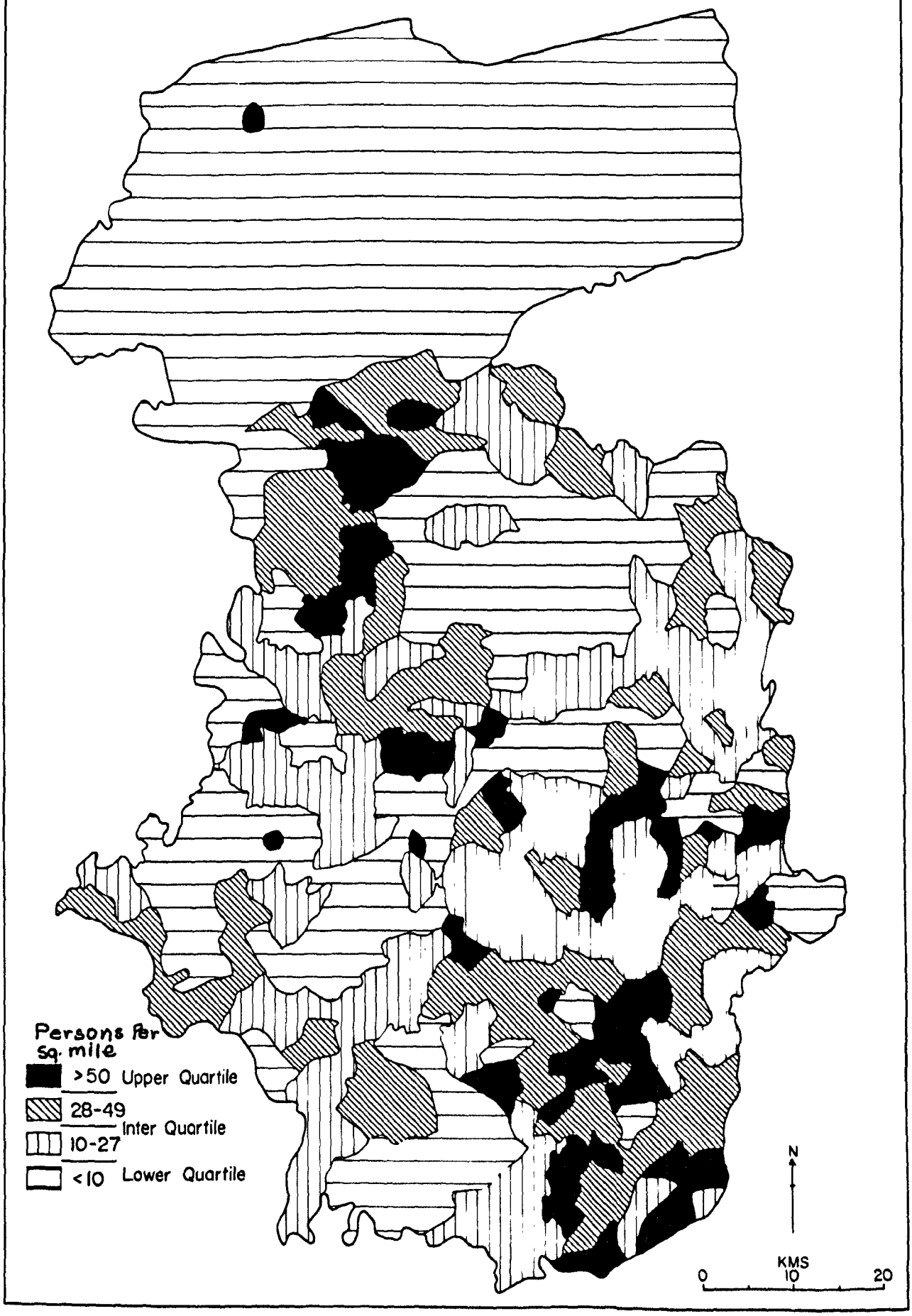
a) <u>The South-Western Lowlands</u>

The south-western lowlands are generally below 200ft above sea-level, but most of the settlements are at heights between 200 and 250ft., because below this level seasonal flooding for three to four months is the rule. The vegetation here is predominantly swamp grass, sedges and riverain species merging with elephant grass and punctuating lophira bushes on the upper sections (Plate 1.1.).

Plate 1.1. Vegetation on the upper slopes of the bolilands (Western Bombali). Note the budding elephant grass (foreground) punctuated by loph-ira shrub (reddish yellow leaves). Below the slopes is a broad valley bottom covered with lower vegetation of river species.

Fig. 1·3

DISTRIBUTION OF FARM POPULATION 1963



Soils in this region are of loamy clays and river detritus, friable and easily worked by farmers (Plate 1.2). The region however offers more promise to the farmer concentrating on swamp cultivation than to the peasant cultivator who is interested in growing a host of other crops. For example, the latter intercrops groundnuts with corn, beans, cassava and other vegetables. The natural friction between the peasant and nomad is present here, because between December and January the swampland region still has streams and herdsmen let their cattle loose in search of drinking water. The lowlands form some of the least populated parts of the district even though they are of relatively high fertility (Fig. 1.3).

b) The Central Uplands

Most of the Chiefdom towns in Bombali are situated within the central uplands. Swamp rice is cultivated on narrow river terraces, while on higher land there is upland rice cultivation and crops like cassava, groundnuts and vegetables. A large proportion of the farm population in the district is located within this region (Fig. 1.3) and land use problems are numerous.

The vegetation is mainly secondary bush and savanna, but with one or two cultivations the prevalent soils from granite and acid gneiss are easily eroded and forest regrowth is very slow. The situation is generally worsened by the Fullah herdsman who burns the bush in January and

Plate 1.2. A recently ploughed rice field in the boliland. The extremely flat terrain permits mechanisation. The soils are rich loams, mainly formations of detritus from the Small Scarcies River and its tributaries.

February for fresh pastures.

c) The North-Eastern hills

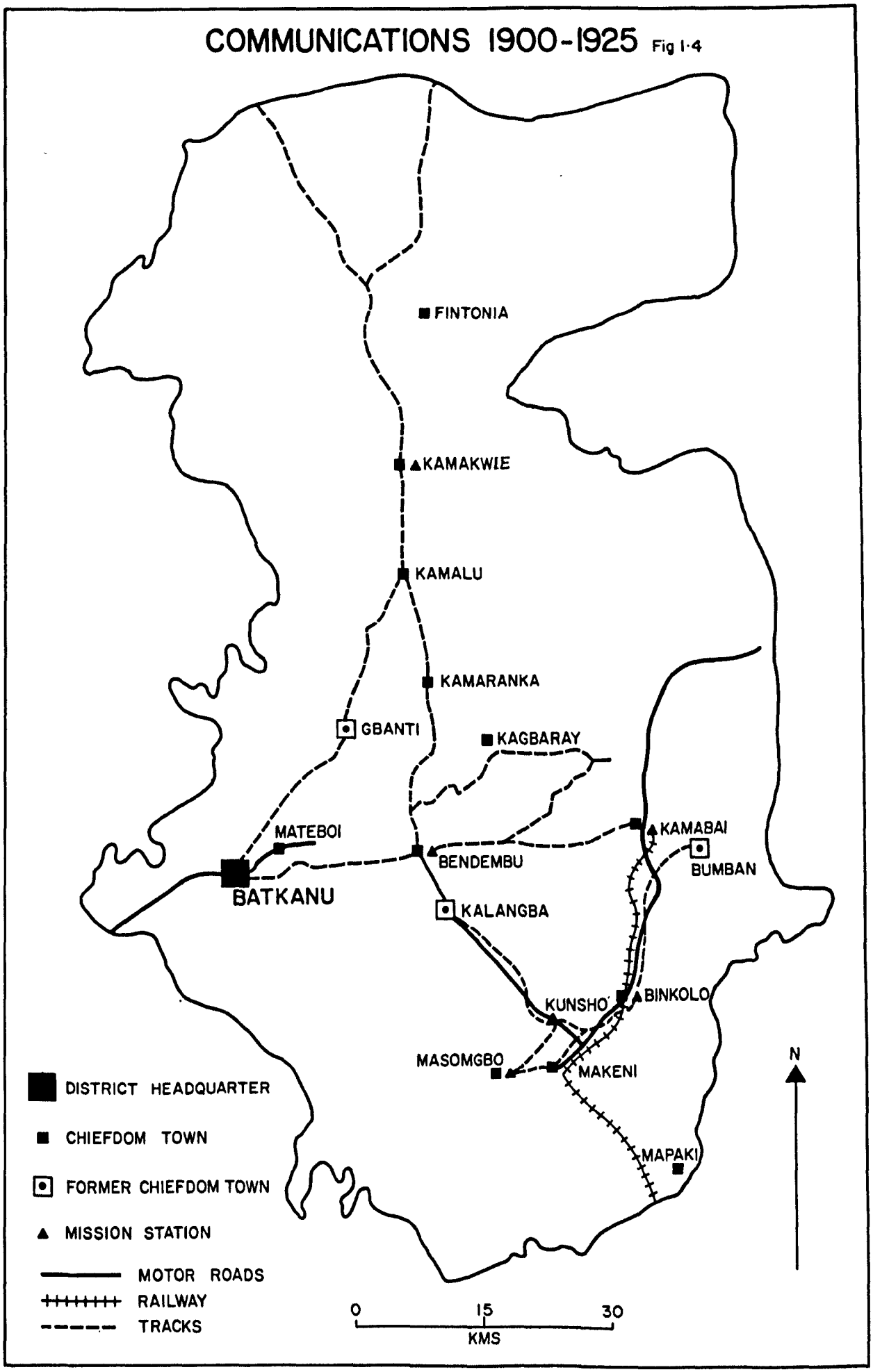
The north-eastern hills offer more difficulties for peasant cultivation than the other two regions, and yet here one finds Biriwa, the most populous chiefdom in the district (24,546 inhabitants). In large parts of this region, igneous formations of the northern hills are exposed to the surface (Plate 3.2). The narrow fertile belts of land available are intensively cultivated. More than elsewhere there is good grazing land. The land owning community is comprised however of predominantly shifting cultivators. Consequently there is the usual competition in land use between farming and grazing, and the conflict between the stranger Fullah herdsman and other indigenous tribes that have no interest in cattle rearing.

HISTORICAL DEVELOPMENTS

Bombali district has had a very short history of development and contact with western civilization. The change from peasantry and barter to a cash economy started at the beginning of this century. Larger towns of the district at present - Makeni and Kamakwie - are nineteenth century offsprings of a new system of economy within this rural environment. Makeni was not founded until 1890 although several villages existed previously from which the town later grew. (Simpson, 1968, 26) Kamakwie, the second largest town was founded about 1865 by an ousted sick man from a nearby village called Kathiri.

It is not surprising that, excluding comments on early trade routes, little is known about the growth of settlement in this part of the country. What is certain is that northern Sierra Leone had stronger links with Guinea than with the rest of the country. It was an area of secret exchange of goods like kola nuts for cows. It was the southernmost outpost of Mohammedanism. The entrepreneur who benefited most from this trade was the Temne trader, to an extent that he tried to prevent other adventurers from reaching Bombali. As early as 1820, Sir Charles Macarthy, the Governor of Sierra Leone, persuaded the British government to extend the colony. Treaties were extended inland to Mende or Limba countries, but these alliances were often purely nominal (Fyfe, 1956, 117). Limba country is mainly in Bombali and the Lokko who form the third largest group in the district are a Mende offshoot. By 1878 however, Governor Rowe reported that traders were beginning to go to Limba country cutting out the Temnes who traded there (Fyfe, 1956, 121). The development of this district can hardly be a history of more than 80 years of meaningful contact for progress.

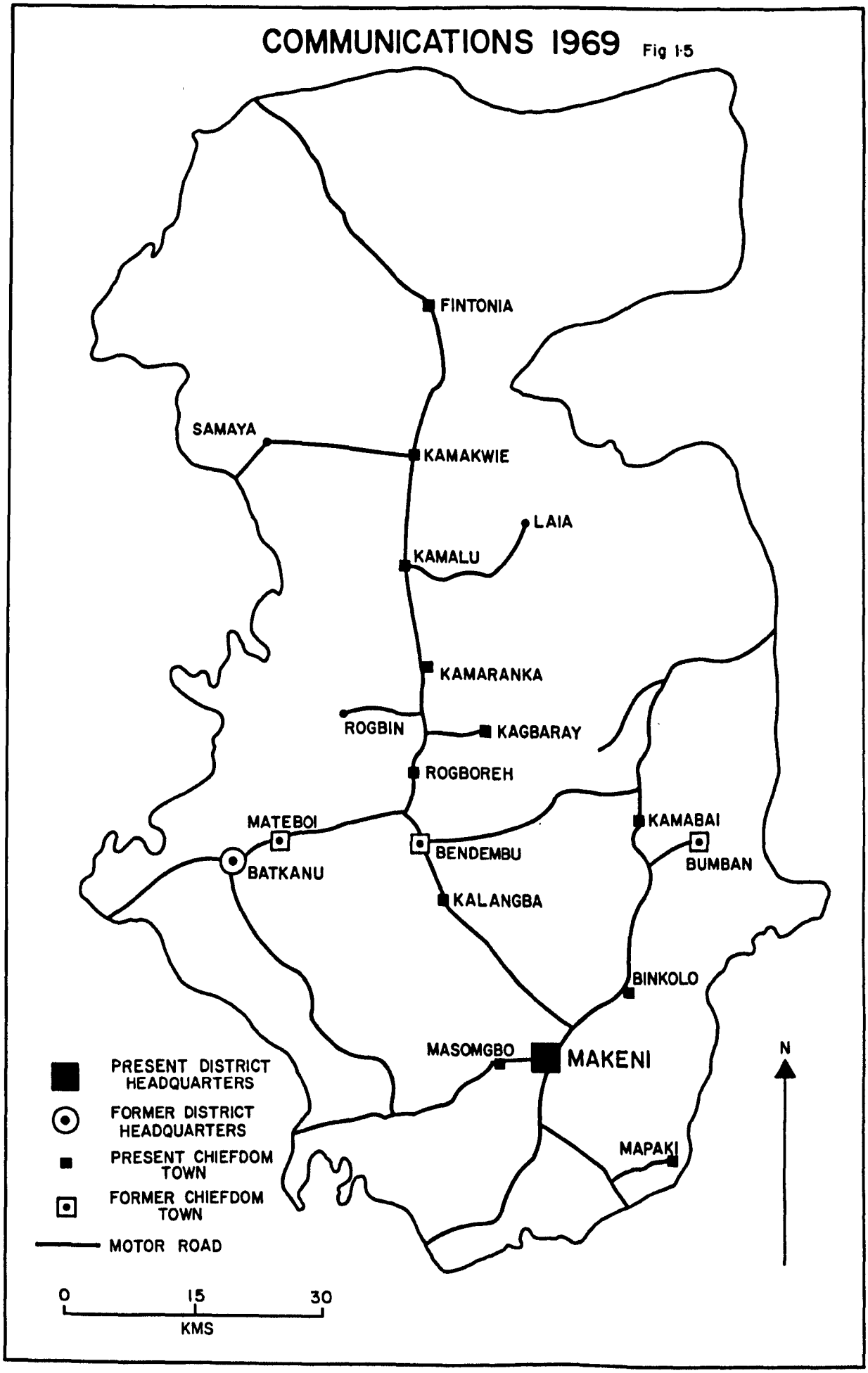
Boundaries of the Protectorate of Sierra Leone were fixed on January 21, 1896 (Government Printer, 1896, K6) and Bombali district was then part of Karene district. Makeni became a district town on May 22, 1916 (Government Printer, 1916, K4) and this was four years after the railway reached this outpost. Direct and active British control


COMMUNICATIONS 1900-1925 Fig 1·4
FINTONIA
KAMAKWIE
KAMALU
KAMARANKA
GBANTI
KAGBARAY
MATEBOI
BATKANU
BENDEMBU
KAMABAI
BUMBAN
KALANGBA
KUNSHO
BINKOLO
MASOMGBO
MAKENI
MAPAKI
N
DISTRICT HEADQUARTER
CHIEFDOM TOWN
FORMER CHIEFDOM TOWN
MISSION STATION
MOTOR ROADS
RAILWAY
TRACKS
0
15
30
KMS

over this part of the country came a few years after missionary infiltration. By 1878 Fyfe reports that Methodists sent missionaries to the Limba country - the first example of a pioneer mission in Sierra Leone going to a virtually unknown area to establish a permanent station (Fyfe 1956, 121).

By 1889 Wesleyan Methodists had established stations in Bombali. The mission station at Kunsho was established in 1889; Masomgbo, 1895; Kamabai, 1908 and Binkolo, 1908. The first primary school in the district was located at Kunsho (1893) and a boarding school for girls was opened at Kamabai in 1909. The hospital at Kamakwie started as a small health centre in 1920. Within a period of 25 years the rapid infiltration of missionary activity is yet to be equalled in this district. This form of infiltration tended to dictate the pattern of road development in Bombali.

Between 1889 and 1910 there were no motorable roads in the whole district (Fig. 1.4). The main routes were simple footpaths converging on Batkanu, then the administrative centre of Karene district. From Batkanu people travelled to Port Lokko and then by sea to Freetown. The period between 1910 and 1935 saw a rapid development in road construction. This in turn affected the direction in trade. The rail route to Freetown from Makeni offered a more direct means of transportation for chiefdoms south of Batkanu. By 1916 railway construction had reached Kamabai, a distance of

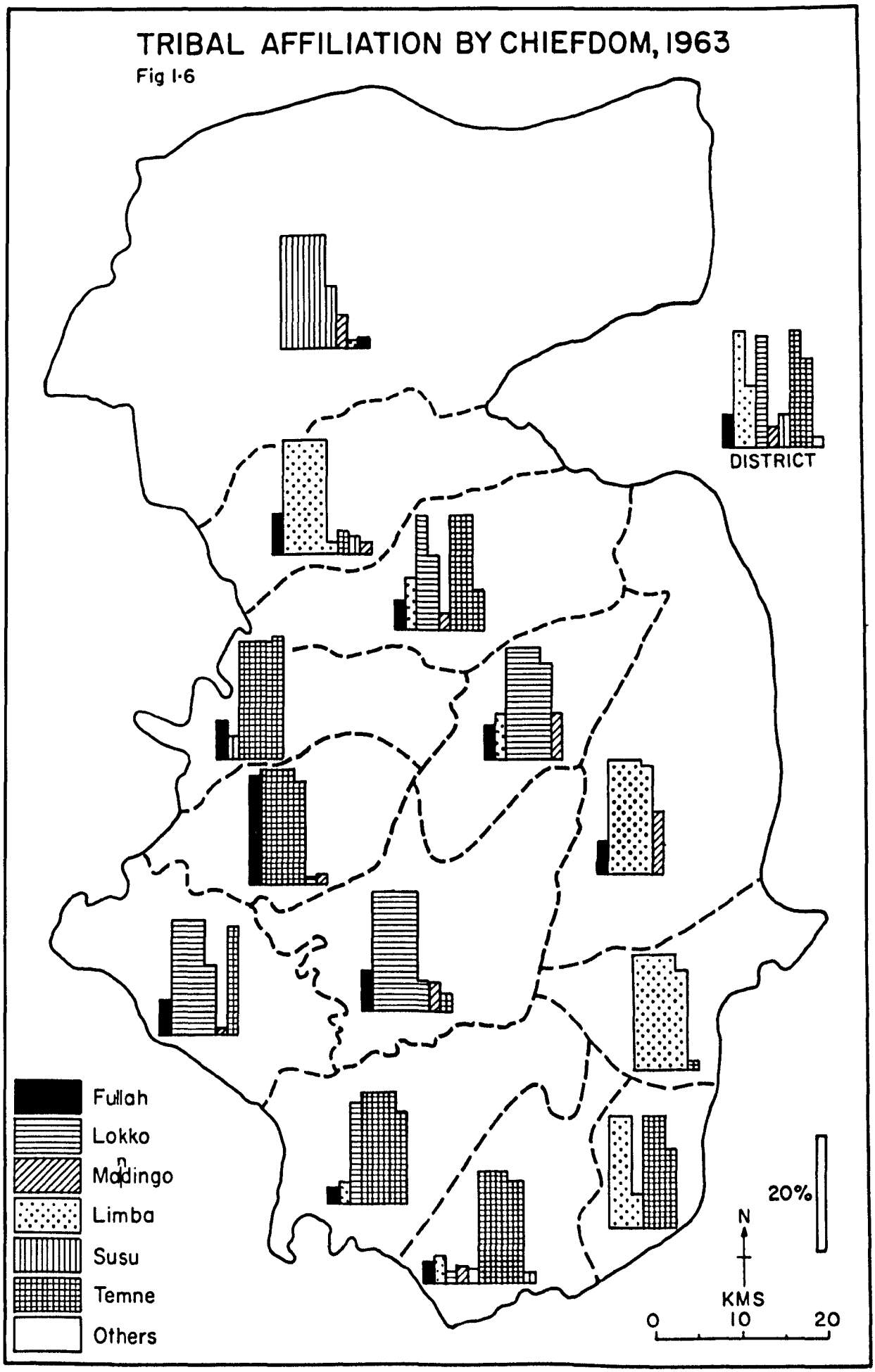

COMMUNICATIONS 1969
Fig 1·5
FINTONIA
SAMAYA
KAMAKWIE
LAIA
KAMALU
KAMARANKA
ROGBIN
KAGBARAY
ROGBOREH
MATEBOI
BATKANU
BENDEMBU
KALANGBA
KAMABAI
BUMBAN
BINKOLO
MASOMGBO
MAKENI
MAPAKI
N
PRESENT DISTRICT HEADQUARTERS
FORMER DISTRICT HEADQUARTERS
PRESENT CHIEFDOM TOWN
FORMER CHIEFDOM TOWN
MOTOR ROAD
0
15
30
KMS

22 miles north-east of Makeni. Further railway construction would have taken a north-westerly direction (from Kamabai) to tap the rich chiefdom of Sela Limba (Slater, 1925).

Since rail transportation reached the district before the motor road, Makeni became a most central point with regards to early means of communication. This town became the main service centre for settlements north of it. By 1925 the motor road from Makeni to Kamakwie had been completed up to 18½ miles, the Makeni to Kabala road had reached mile post 31. The Port Lokko to Batkanu road then had 39 completed miles while only 8 miles of motorable road were constructed between Batkanu and Bendembu (Lake, 1925,12). By 1930, the main roads within the district had been constructed and all are still the same as they were 40 years ago - dirt roads and wooden bridges. Little road construction took place between 1931 and 1945. Later trunk roads were built linking the two major areas of Makeni to Kamakwie and Makeni to Kabala (Fig. 1.5), but the railway was scrapped in 1969 and Makeni has grown from a bare hamlet in 1900 to the centre of the district with a population that is more than half the number of the inhabitants of its chiefdom.

THE PEOPLE OF BOMBALI

The population of the Bombali district is typical of most rural ethnic complexities. In 1963 there were no less


TRIBAL AFFILIATION BY CHIEFDOM, 1963
Fig 1·6
DISTRICT
Fullah
Lokko
Mandingo
Limba
Susu
Temne
Others
20%
N
KMS
0
10
20

than 10 tribal groups enumerated in the district, six of whom accounted for 98·8% of the population (Table 1.1).

Table 1.1 Major tribal groups in Bombali, 1963

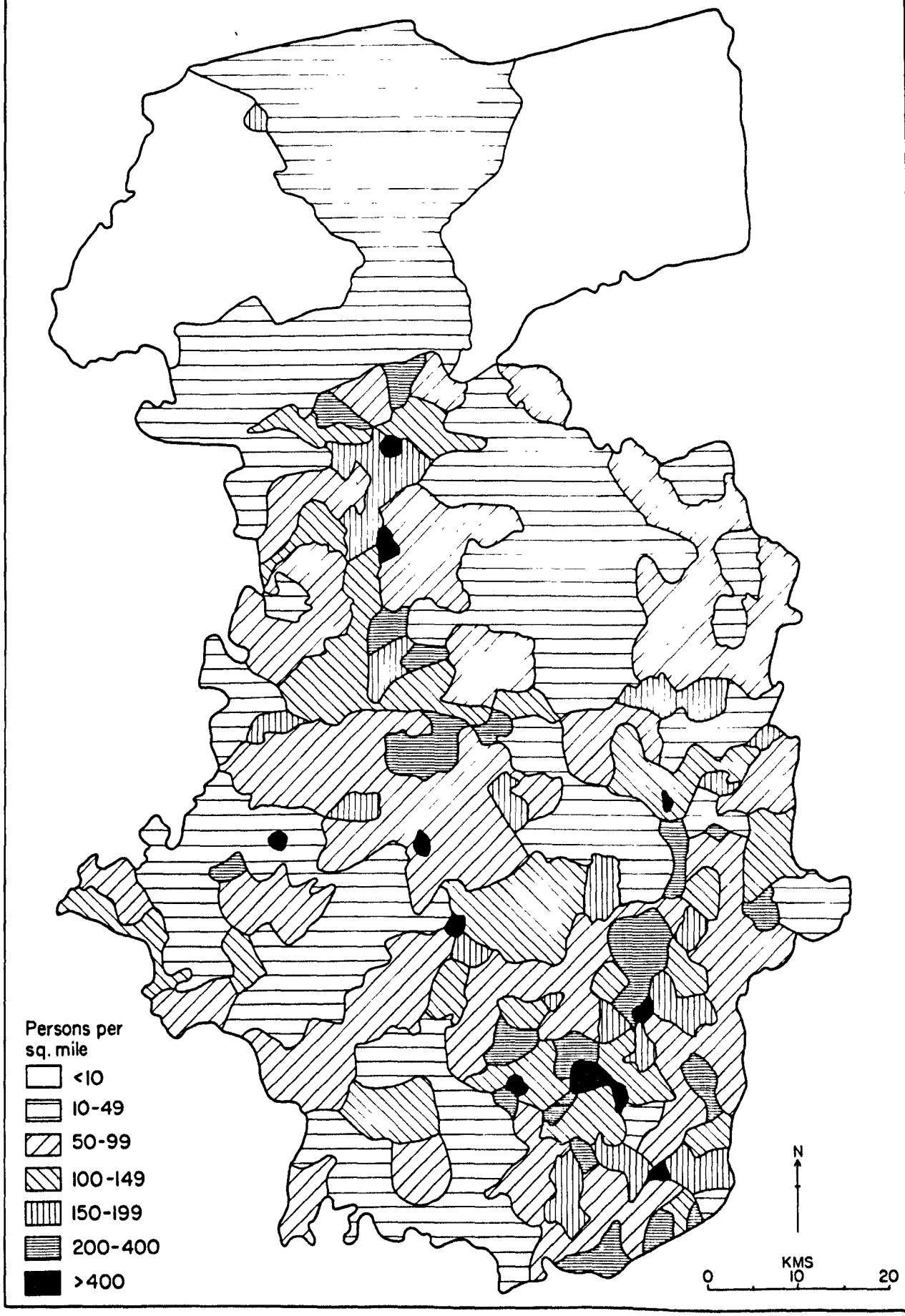
Tribe	Number	% total population
Temne	70,103	35·27
Limba	59,589	29·98
Lokko	38,566	19·40
Susu	10,636	5·35
Fullah	10,584	5·32
Mandingo	6,819	3·43
Mende	897	0·45
Creole	290	0·15
Kuranko	147	0·07
Sherbro	128	0·06
Others	777	0·39
Non-Sierra Leonean	240	0·03
Total	198,776	99·99

Source: Sierra Leone Census Report, 1963, 25.

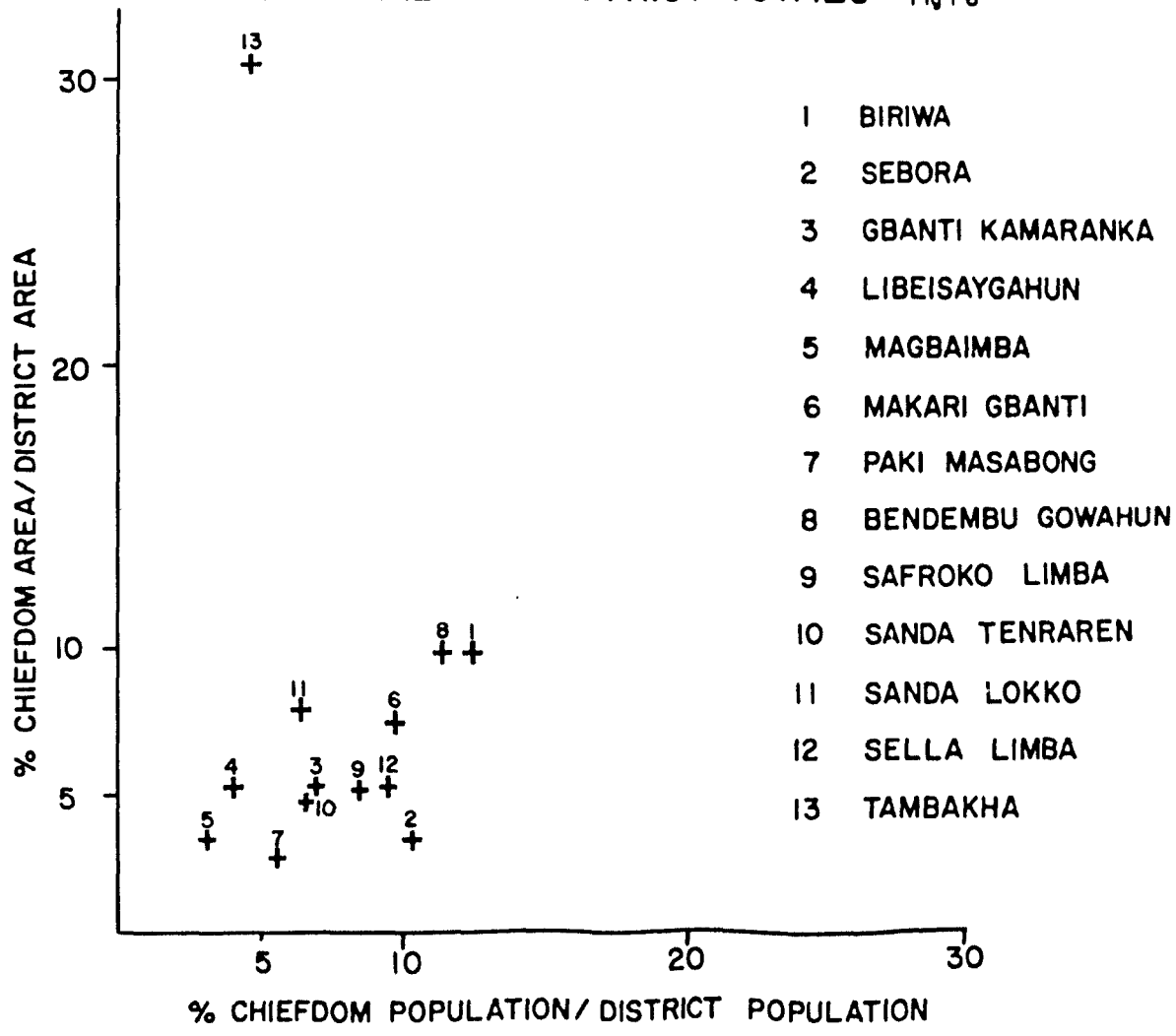
The district is subdivided into 13 administrative units known as chiefdoms, which are tribal in origin and composition (Fig. 1.6). Only in two chiefdoms can one find at least two main tribes forming a combined majority of over 72% of the total population: in the Makari Gbanti chiefdom 45·4% of the population is Limba and 53·8% Temne, and in Sanda Lokko chiefdom 35·3% of the population is Lokko and 46·7% Temne. Four chiefdoms have a Temne majority of over 72% of the total population. The Limba and Lokko each have three chiefdoms where they are preponderant, and the Susu, one.

Fig. 1·7

DISTRIBUTION OF POPULATION 1963



RATIOS OF CHIEFDOM POPULATION AND AREA TO DISTRICT TOTALS Fig 1·8



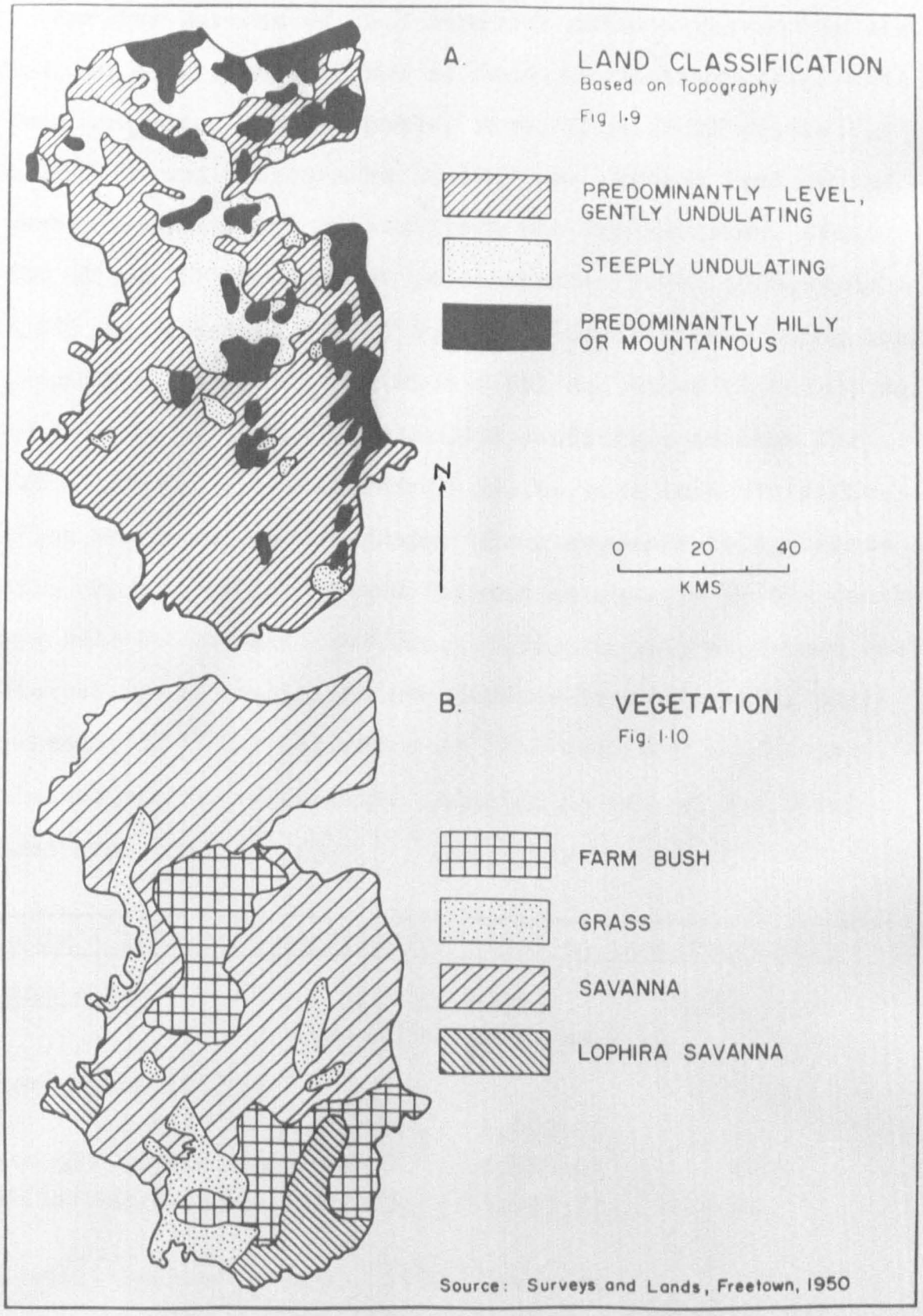
The distribution of population is generally related to the physical regions but human and economic factors have tended to be equally striking determinants. The highest densities are found at cultural centres or chiefdom towns. From these centres densities decrease rapidly towards the fringe areas of the chiefdoms. The motorable roads have contributed to the linear distribution of density patterns but the circular gradation is evident in most cases, from the central town of each chiefdom (Fig. 1.7) to outlying areas.

Excluding tribal groups the religious complexity is marked: about 30% of the population is Protestant, 15% Catholic, 30% Moslem and 25% Pagan. Less than 2% of the inhabitants had had formal schooling by 1963. The most complex element concerns the rigid compartmentalisation of society through traditional norms to the extent that land exploitation is traditional in outlook. For example, Tambakha chiefdom is 91% Susu with about one-third of the total area of the district and yet accounts for barely 5% of the district population (Fig.1.8).

The different landscapes offered by the environment are simple compared with the human situation. As Pollock observes, the major problem now lies in the development and organisation of the human resources (1968, 1). Such a development should comprise major changes in the distribution of service centres and the network of roads. It should be meaningful development at both local and national levels. While

Pollock denies that he suggests solutions and criticizes present organisational structures in part of the report on mechanical rice farming (1) he reveals certain obstacles to human development that are relevant to this study. For example, there is the observation that about one-third of the farmers using the tractor rental scheme in 1964 were from Makeni or Magburaka accounting for 50% of the acreage (6). There is also the suggestion that in any administration of mechanical cultivation the interdependence of farmers from villages and smaller investors from towns must be taken into account (8).

These observations are indicators of organisational problems in the establishment of an agricultural innovation in a district where local human resources are far from developed. Farming accounted for 90·1% of the working population in Bombali in 1963. Illiteracy and traditionalism tend to have a strong grip on production factors here and there is the problem of finding adjustments of policies for agricultural development suitable for these local environments. Previous attempts at agricultural development planning have tended to lay less emphasis on the impact of local human groups and cultures. The gravest of all mistakes likely concerns tolerance on the part of early administrators of cattle rearers who are nomadic in lands of predominantly shifting cultivators. This has led to greater rates of land impoverishment and more conflict between the peasant cultivator and the herdsman.


A.
LAND CLASSIFICATION
Based on Topography
Fig 1.9
PREDOMINANTLY LEVEL, GENTLY UNDULATING
STEEPLY UNDULATING
PREDOMINANTLY HILLY OR MOUNTAINOUS
N
0 20 40
KMS
B.
VEGETATION
Fig. 1.10
FARM BUSH
GRASS
SAVANNA
LOPHIRA SAVANNA
Source: Surveys and Lands, Freetown, 1950

LAND RESOURCES IN BOMBALI

Earlier surveys of land resource characteristics in the district show some evidence of land degradation, originating from shorter fallow periods, fire, high local population densities and competition in land use between land owning peasant cultivators and squatters who are herdsmen. About 65% of the district is of predominantly level topography - 1,885 sq. miles (4,882·13 sq. km.). Steeply undulating land amounts to 21% of the district - 612 sq. miles (1,585·07 sq. km.) while hilly and mountainous conditions account for 14% - 403 sq. miles (1,043·77 sq. km.). A land classification map based on topography alone suggests fairly suitable conditions for upland farming especially in the southern half of the district (Fig. 1.9). Further north and east, steeper slope conditions are serious limitations to agriculture. By 1950, estimates of land with minimal slope limitations to agriculture amounted to 86% of the total land area (Table 1.2).

Table 1.2 Land classification based on topography only

Land class	Approx. area (sq.miles)	(sq. km.)	% district
Predominantly level	1,885	4,882·13	65
Steeply undulating	612	1,585·07	21
Hilly/mountainous	403	1,043·77	14

Source: Surveys & Lands, 1950, Freetown.

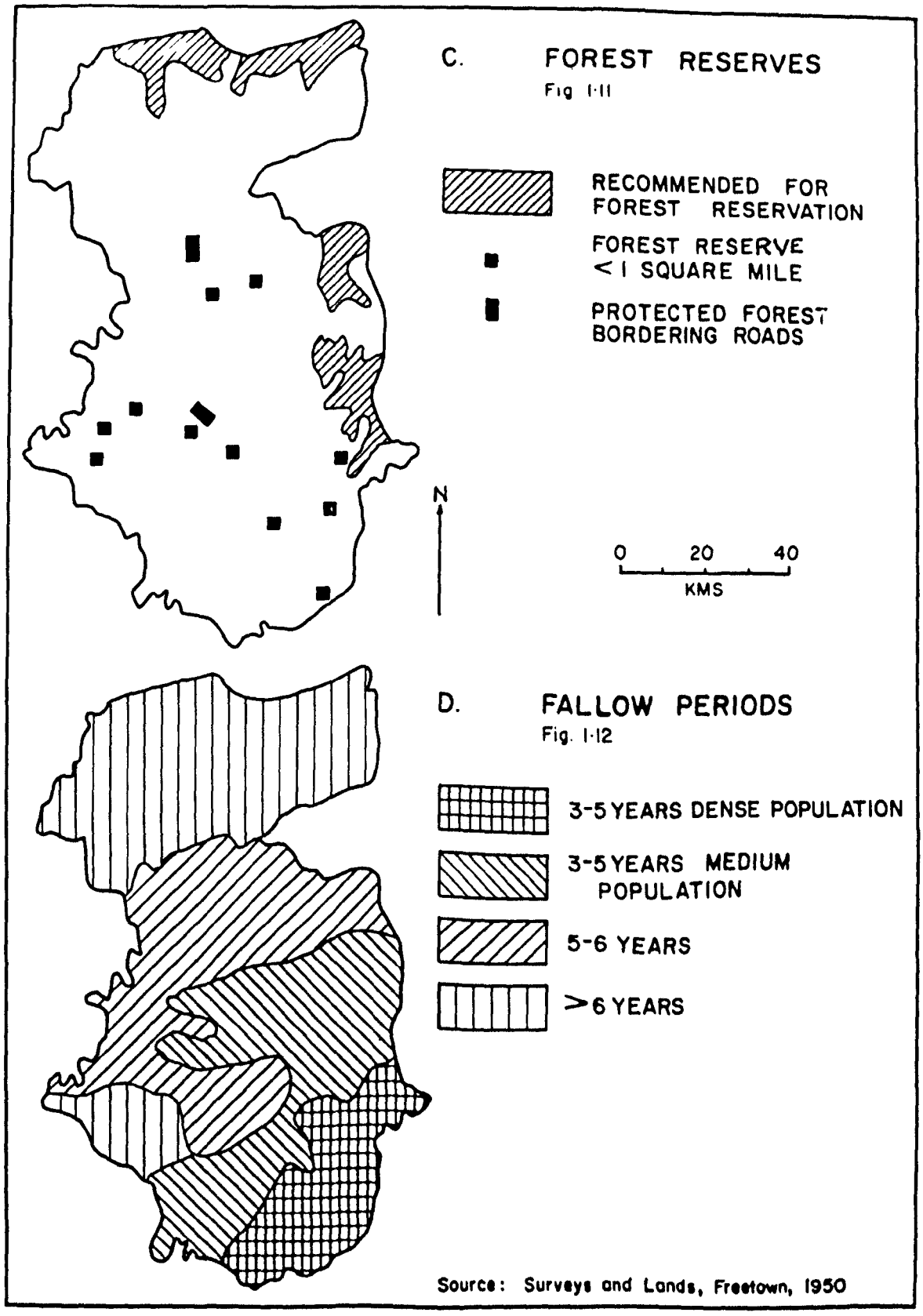
The general pattern of vegetation distribution by 1950 shows some evidence of long periods of original forest depletion to a point where little virgin forest is left (Fig. 1.10). Various forms of derived vegetation and climatic climax species have developed and these tend to indicate levels of fallow duration. Lophira bush, a climatic climax type of vegetation accounts for 8% of the land area (223 sq. miles - 577·57 sq. km.). This is a secondary bush growth that is fire resistant. In Bombali lophira bush is mainly found to the south where shorter fallows and more frequent burning have reduced the volume of plant population. Farm bush represents longer periods of fallow and is of central distribution in the upland area of northern Bombali. To the south it is found north of the lophira bush belt. This farm bush belt accounts for about 19% of the district or 555 sq. miles - 1,437·44 sq. km. (Table 1.3).

Table 1.3 Land classification based on principal vegetation type

Vegetation type	Approx. area (sq. miles)	(sq. km.)	% district
Farm bush	555	1,437·44	19
Lophira bush	223	577·57	8
Savanna	1,804	4,672·34	62
Grass	318	823·62	11

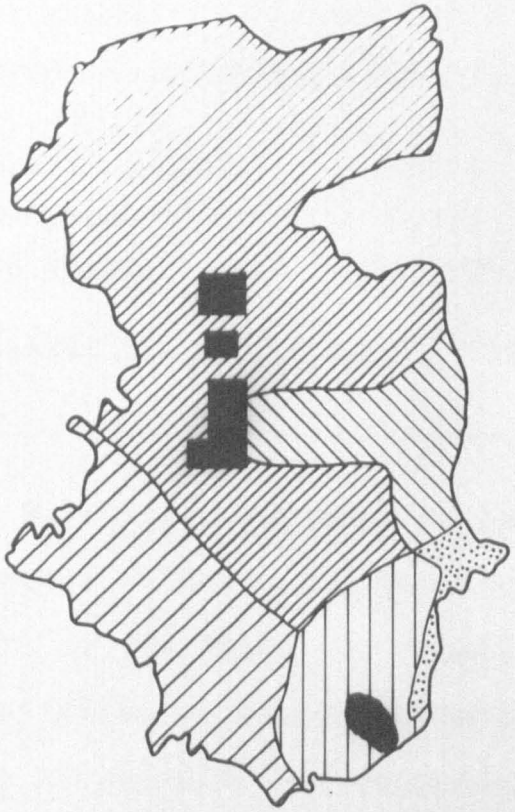
Source: Surveys & Lands, 1950, Freetown.

Two varieties of grass vegetation account for 73% of the land area - grasses of swamps and hills (11%) and savanna


C. FOREST RESERVES
Fig 1·11
RECOMMENDED FOR FOREST RESERVATION
FOREST RESERVE < 1 SQUARE MILE
PROTECTED FOREST BORDERING ROADS
N
0 20 40
KMS
D. FALLOW PERIODS
Fig. 1·12
3-5 YEARS DENSE POPULATION
3-5 YEARS MEDIUM POPULATION
5-6 YEARS
>6 YEARS
Source: Surveys and Lands, Freetown, 1950

or derived grasslands of the upland region (62%). While much of southern Bombali is gently undulating there is a more complex pattern of vegetation here than in the north. To the south there is a combination of lophira, farm bush and grass, to the north there is farm bush and savanna. The limit of savanna to the south roughly describes the northern extent of the 100" isohyet.

Previous attempts at land organisation were partly successful in maintaining forest reserves in regions that are topographically unsuitable for farming. Elsewhere a few forest plantations, each under a square mile in area, have been developed (Fig. 1.11). Including these forest plantations about 301 sq. miles (779·59 sq. km.) are under forest which is nearly 10% of the total land area. Further forest reservation schemes are likely to contend with land ownership problems especially in places of low fallow periods (Fig. 1.12). For example, there is the more densely populated south-eastern portion of Bombali where fallow periods range between three to five years. By 1950 about 35·5% of the district was already subjected to fallow periods of not more than five years (Table 1.4). Most of the west central portion of the district was under a five to six year fallow regime and this accounted for about 28·5% of Bombali. In other words 61% of the district was subjected to fallow periods of six years or less by 1950.



E. PRIMARY CAUSES OF LAND DEGRADATION

Fig 1·13

FIRE

FIRE AND DENSE POPULATION

FIRE AND NATURAL CAUSES

FIRE TOPOGRAPHICALLY UNSUITABLE

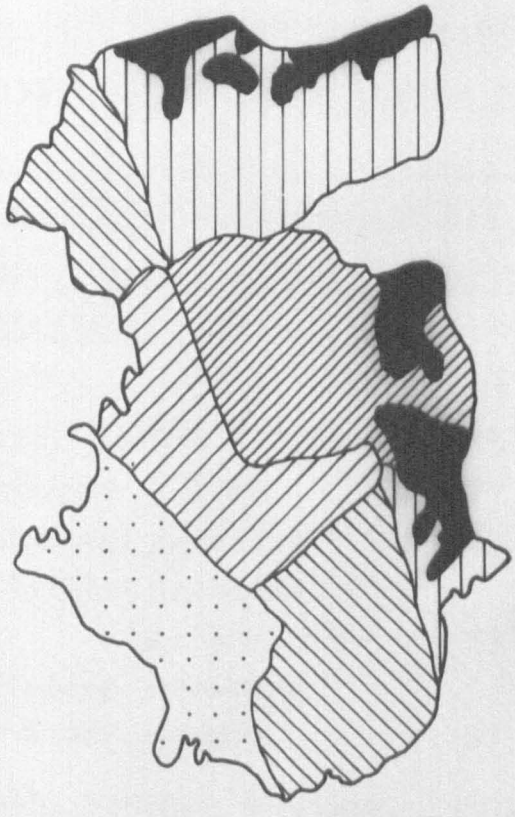
POPULATION PRESSURE

TOPOGRAPHICALLY UNSUITABLE AND POPULATION PRESSURE

N

0 20 40

KMS



F. PROPOSED ZONES OF PRODUCTION

Fig. 1·14

ARABLE FARMING

TREE CROPS

CATTLE ZONE

SECONDARY CATTLE ZONE

LOW PRODUCTIVITY

FOREST

Source: Surveys and Lands, Freetown 1950

Table 1.4 Land classification based on fallow periods

Fallow period	Approx. area (sq. miles)	(sq. km.)	% district
3-5 years (dense population)	355·7	921·26	12·0
3-5 years (medium pop.)	682·9	1,768·70	23·5
5-6 years	827·5	2,143·22	28·5
> 6 years	1,033·9	2,667·79	36·0

Source: Surveys & Lands, 1950, Freetown.

Population pressure on land is one important cause of shorter fallows, but the use of fire in farm clearance as well as the quest for fresh grazing land is a greater limitation to rapid vegetation regrowth. The whole district was almost entirely degraded land by 1950 (Fig. 1.13). Fire was the primary cause of land degradation for about 88% of the land area (Table 1.5). Areas degraded by popul-

Table 1.5 Land classification based on causes of degradation

Primary causes of land degradation	Approx. area (sq. miles)	(sq. km.)	% district
Fire	1,691	4,379·67	58·30
Natural causes & fire	515	1,333·84	17·74
Topography & fire	277	717·43	9·57
Population pressure	277	717·43	9·57
Population pressure & fire	83	214·97	2·86
Population pressure & topography	57	147·63	1·96

Source: Surveys & Lands, 1950, Freetown.

ation pressure alone accounted for about 10% while farming in topographically unsuitable terrain was responsible for a bare 2% of Bombali land. South-western Bombali has been impoverished mainly by population pressure. Further north, larger villages along the motor road are isolated instances where fire and population pressure are primary causes.

As indigenous settlement in the district is primarily of peasant farmers it is difficult to justify the proposed zones of agricultural production in 1950 (Fig. 1.14). The Fullah herdsman had settled in the district long before this time but his acquisition of land hold rights for cattle rearing has never been achieved beyond good will on the part of local landowners. Notwithstanding this obstacle about 41% of Bombali was declared a cattle zone. Arable farming and tree crops were to account for 29% of the land while 11% was devoted to forest (Table 1.6). Farm bush and

Table 1.6 Proposed zones of production, 1950

Zone of production	Approx. area (sq. miles)	(sq. km.)	% district
Arable farming	756	1,958·03	26·0
Principal cattle zone	675	1,748·24	23;0
Secondary cattle zone	530	1,372·69	18·0
Area of low productivity	530	1,372·69	18·0
Forest reserves	316	818·44	11·0
Tree crops	93	240·87	3·0

Source: Surveys & Lands, 1950, Freetown.

lophira do coincide with arable farming to the south-west, but the farm bush belt to the north is described as a principal cattle zone. The proposed area for tree crop cultivation is mainly to the north of this cattle zone - in Tambakha chiefdom. The presently productive swamp rice region to the south-west (part of the bolilands) is described as a zone of low agricultural productivity.

These proposed zones of production were a result of generalised observations of few production factors, some of which may not be clearly understood. For example, the absence of detailed land capability data makes it difficult for one to delimit production zones. The conflict between sedentary peasant cultivators and nomads tended to be underestimated while little attention was paid to the relative isolation of the district from more prosperous parts of the country. The end-product of these early mistakes amounts to the worst type of underdevelopment involving underdeveloped human resources within a hostile environment, where land, an important production factor, is already in a state of degradation.

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CHAPTER II

THE FAMILY AS A LABOUR UNIT IN AGRICULTURAL PRODUCTIVITY

INTRODUCTION

Agricultural productivity is labour intensive in most underdeveloped communities in Africa. In Bombali labour for farm work/is derived mainly from communal efforts. For example there are local workmen's societies ("compins") which are organised labour groups. Farms of "compin" members are operated in turns and the amount of labour in-puts at an individual member's farm tends to be proportional to the size of registered membership from his household. Farmers with smaller families tend to hire farm labour from these "compins" for major work like brushing, clearing and ploughing. Payment for farm labour involves token sums of about £5-£10, but the farm owner has to feed the "compin" for that day of work. Membership of a work society is a less expensive means of acquiring labour. The size of the family then becomes a strong determinant of farm sizes and peasant productivity. Various types of family relationships do subsist primarily as a booster to the size of family labour units. For example, there is the traditional extended family unit wherein distant relationships are in a single household under the leadership of a family head. This chapter examines the relationship of the traditional family, its concepts of ownership, indebtedness and cash economics; with agricultural productivity.

There are both male and female working groups. The male groups do the harder farm work - brushing, clearing and ploughing. The women are involved in more delicate work like weeding, planting of maize, groundnuts, potatoes and sowing rice. Polygamous households tend to have a larger labour force than non-polygamous households. In both situations there is the urge to acquire more labour by encouraging distant relatives to subsist in a single household. Larger farms do not necessarily mean higher cash returns for farm operators. Labour is to a large extent non-remunerative but large portions of the farm produce form the food supply base for the labour unit. Capital formation is negligible and subsistence seems to be the rule.

The application of experiences in development planning from developed to backward countries has been criticised as an unselective export of the dualistic concept of modern and traditional sectors (Eisenstadt, 1966). In Bombali, development planning will contend with concepts of labour acquisition in productivity which are different from those of developed countries. Eisenstadt has tried to prove that the traditional family, a generally accepted restraint to rural development, is capable of self-sustained growth (1966). This is most probable in a situation where tradition has evolved together with education and where concepts of cash economics have had longer periods of

crystallisation. In Bombali the concept of a cash economy is a twentieth century notion introduced in a predominantly rural and traditional community by a foreign authority. This authority encouraged competition in land use between illiterate land-owning farmers and a landless but potential minority of nomads.

The integration of indigenous labour communities in agricultural productivity is an essential study of the reaction of traditionalism to modern concepts of institutional organisations in cash economies. In this context, an understanding of local characteristics tending to stabilise traditional institutions is necessary. Consider, for example, aspects such as ignorance, inability and unwillingness of rural societies to face the challenge of economic progress. In rural development, however, there are hardly any two regions of identical characteristics, so there is no single plan, solution or approach to rural underdevelopment, each region requiring study as a separate entity. An attempt has been made at studying aspects of unwillingness and land transfers in the district (Chapter 3) but preliminary studies in this chapter concern the family unit and the basis of land inheritance rights.

The unifying element in underdevelopment studies is man, the central object of development. Whether economic change in the rural landscape is generated by external or internal forces, man, located at a defined region, affects and is

affected by the entire process of change. Experiences in rural development from advanced countries can be a necessary background since both parts of the world have underdeveloped regions and do face the same goal of development. The central idea is that rural man at a particular location must be taken into account in reviewing prospects for development. This involves a process of disintegration when characteristics detrimental to development are observed and defined in a given rural society, and one of re-integration, when adjustments are suggested and implemented to facilitate economic progress.

Rural development is thus a process of society rebuilding presupposing a careful study of man from the lowest level at which he forms an institutional element in society. This level is the family unit, which in this study entails a broader connotation than the nuclear family, though the family unit in Bombali varies in size and structure. The complex family structures observed in the field are suggestive of deeper human relationships which might be of greater interest to the social anthropologist or sociologist (Finnegan, 1965). For the geographer it is the variation in spatial terms of family units that is more interesting.

A major setback of the study of family structures in Bombali concerns the paucity of data. There has been only one national census of the country (in 1963) and no consid-

VILLAGES STUDIED ON FAMILY SIZE, INHERITANCE, OWNERSHIP 1971

Fig 2·1

eration was given to data on family sizes. Previous research investigations have had a stronger sociological than geographical bias: Biyi (1913), Langley (1928), Ture (1939), McCulloch (1950) and Finnegan (1965). More current and relevant works are rather few: Clarke (ed. 1966), Gamble (1967), Turay (1967) and the Central Statistics Office (1969).

Interest in this type of study emanated from a previous study of a village in the district (Turay, 1967) when it was judged that useful general information can be obtained from sample studies. Seventy-five settlements were selected for a study of family characteristics, mainly family size, attitudes on ethnic fusions and inheritance. Ten of these settlements were actually enumuerated in 1970 and 24 were specially studied to assess changes of peasant attitudes towards family sizes (Fig.2.1). Questionnaires on land ownership, inheritance and tribal fusions were prepared (Appendix 2.1) and 1,125 family heads were interviewed. The mean size of an extended family was estimated as 10, based on previous field studies (Turay, 1967). The district population for 1970 has been estimated at 225,000 which corresponds with an annual growth rate of 1·5% as estimated by the Central Statistics Office for this period (CSO, 1970, 4). An estimated 5% sample should therefore be in the neighbourhood of 1,000 to 1,125 family heads.

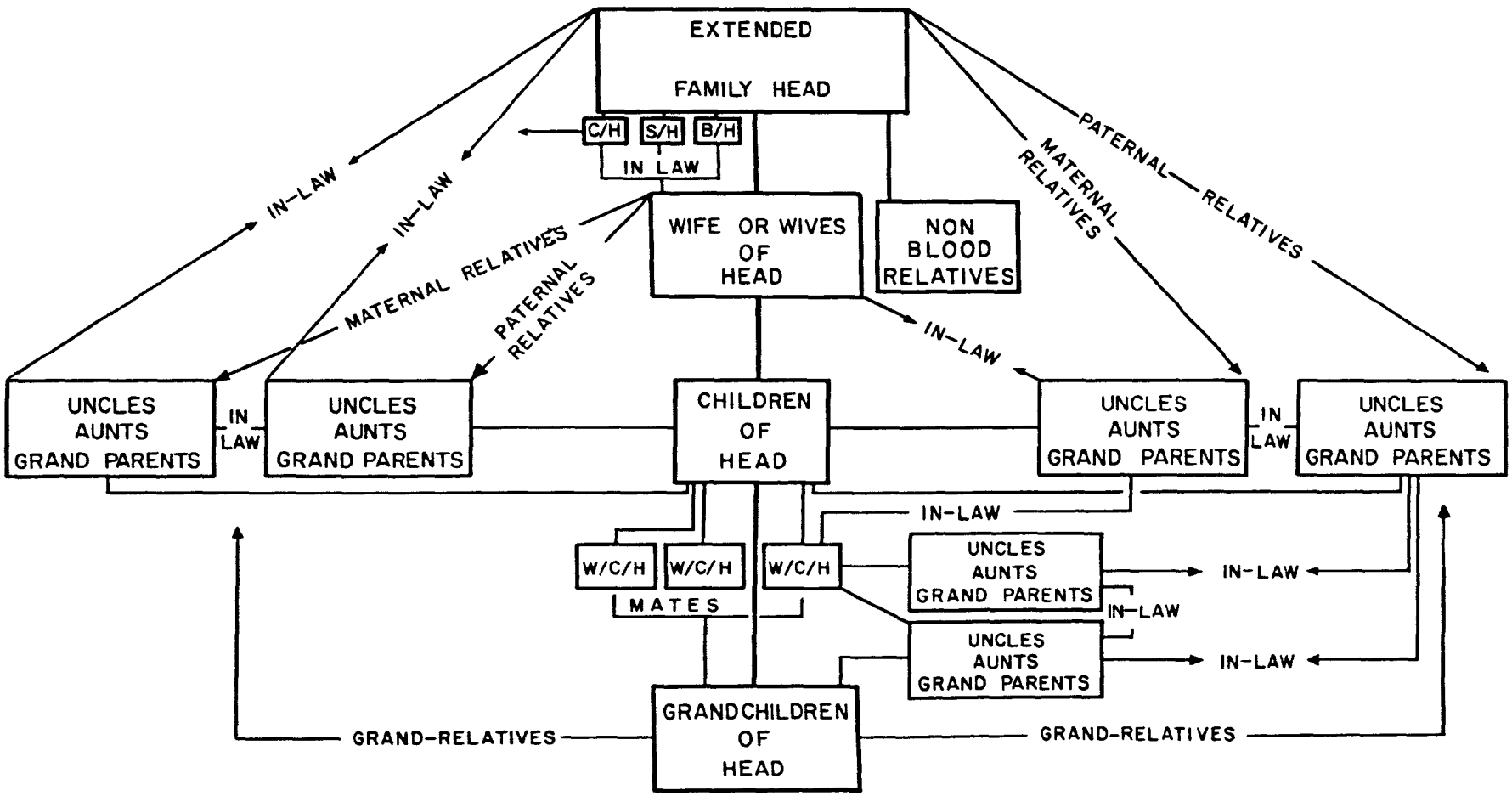
Three principal forms of settlement were of interest in this study: the population in (a) chiefdom towns, (b) villages

close to chiefdom towns and (c) relatively large villages situated in areas of difficult terrain. Limiting factors to the range of settlements were the size of the district, difficulties in communications, language barriers and the absence of previous surveys of this nature. However, by studying chiefdom town and nearby village populations it was easy to detect some changes of local opinions from the cultural centres to their hinterlands. On most interviews it was necessary to pose as a schoolboy in search of knowledge and ideas from "sage" family heads. This attitude put the head of the household in his familiar position of authority and answers came rapidly enough to facilitate the level of coverage that was effected.

THE NATURE OF THE FAMILY UNIT

The family in Bombali is composed of blood and non-blood relations. The unifying factor in this type of structure concerns the acceptance, by the members of the household, of a leader or "father", normally the eldest member of the group. Ties within such a group can be complex. One can identify three principal sub-groups within a single family. First, there may be an outer family nucleus when the head of the extended family has surviving relatives who are older than him. In this case decisions reached on behalf of the family are reached through consultations with such older relations out of the group. There is the inner group or family nucleus of a biological father, wife and children.

STRUCTURE OF THE FAMILY Fig 2·2



C/H COUSINS OF HEAD

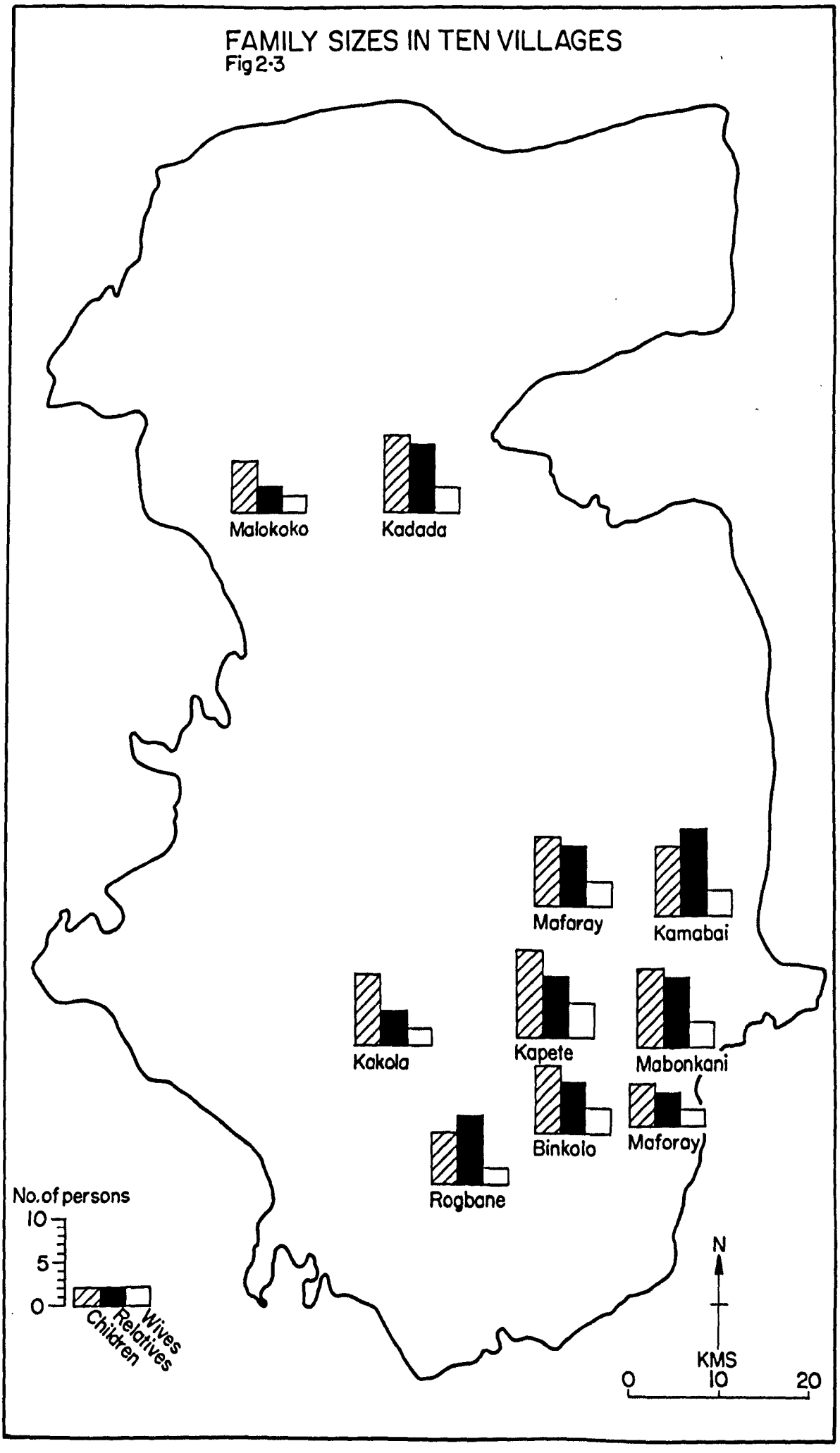
S/H SISTERS OF HEAD

B/H BROTHERS OF HEAD

W/C/H WIVES OF CHILDREN OF HEAD

——— NUCLEAR BASE

——— OTHER BIFURCATIONS


FAMILY SIZES IN TEN VILLAGES
Fig 2·3
Malokoko
Kadada
Mafaray
Kamabai
Kakola
Kapete
Mabonkani
Binkolo
Mafaray
Rogbane
No. of persons
10
5
0
Wives
Relatives
Children
N
KMS
0
10
20

The father in this case may not necessarily be the head of the extended family, but may be if he is the oldest among other nucleations within it (Fig.2.2).

Another small family type worth mentioning is the single parent type where a widow or widower assumes leadership of a family. Here the extended unit may have more relatives than children. If there is a relative older than the parent, he normally becomes the functional head of the unit. Age is often interpreted as experience and knowledge. In most instances, age with the capacity to produce and reproduce is a vital condition for family leadership, the male sex being strongly favoured.

FAMILY SIZE AND COMPOSITION

Tables 2.1a and 2.1b concern some analyses of sizes of extended family units in 10 settlements enumerated in 1970. There is an overriding element of polygamy in the family units (Table 2.1a). The average number of wives per family head is 1·94 and this varies from a non-polygamous situation of one wife to 2.6 per husband. Fifty-four of those enumerated have no blood relations with family heads, but this group, together with distant relatives account for more than 30% of the total number of persons per family. The number of relations tends to be higher with increasing number of wives per family head. In some cases the mean ratio of children to relatives is almost even (Fig. 2.3). The average nuclear family size is about 5.5 irrespective

Table 2.1a Family sizes of male household heads, 1970 - a sample survey

Settlement	Male household heads	Children	per household head	Relatives	per household head	Others	per household head	Wives	per household head	Total persons	Average size of unit
Mafaray	10	41	4.1	32	3.2	4	0.4	14	1.4	101	10.1
Rogbane	5	26	5.2	26	5.2	8	1.6	8	1.6	73	14.6
Mabonkani	11	73	6.6	64	5.8	0	0.0	20	1.8	168	15.3
Kamabai	12	71	5.9	68	5.7	12	1.0	25	2.1	188	15.7
Maforay	19	102	5.4	91	4.8	2	0.1	38	2.0	252	13.3
Malokoko	3	17	5.7	9	3.0	0	0.0	3	1.0	32	10.7
Kadada	12	78	6.5	64	5.3	11	0.9	30	2.5	195	16.3
Kakola	18	73	4.1	37	2.1	0	0.0	25	1.4	153	8.5
Kapete	8	57	7.1	34	4.3	4	0.5	21	2.6	124	15.5
Binkolo	26	155	6.0	103	4.0	13	0.5	57	2.2	354	13.6
	M	M	M	M	M	M	M	M	M	M	M
	124	693	5.6	528	4.3	54	0.4	241	1.94	1640	13.2

Table 2.1b Family sizes of female household heads, 1970 - a sample survey

Settlement	Female household heads	Children	per household head	Relatives	per household head	Others	per household head	Total persons	Average size of unit	Persons per household head
Maforay	1	5	5.0	4	4.0	0	0.0	10	10.0	9.0
Rogbane	1	0	0.0	8	8.0	3	3.0	12	12.0	11.0
Mabonkani	2	8	4.0	1	0.5	0	0.0	11	5.5	4.5
Kamabai	2	7	3.5	20	10.0	2	1.0	31	15.5	14.5
Binkolo	5	20	4.0	16	3.2	2	0.4	43	8.6	7.6
	Σ	Σ	x̄	Σ	x̄	Σ	x̄	Σ	x̄	x̄
	11	40	3.6	49	4.5	7	0.64	107	9.7	8.7

of its polygamous characteristics. This is indicative of possibly high mortality rates offsetting high fertility rates prevalent in such communities (Turay, 1967). The mean size of the extended family in all villages is 12·2, ranging from 8·5 at Kakola village to 17·3 at Kadada.

Among families of female family heads there is a tendency towards smaller family sizes (Table 2.1b). The mean family size is 9.7 but this varies between 5.5 and 15·5. Non-members of the nuclear family form more than 50% of the household population. The mean number of children per female family head is 3·6, contrasting with 5·6 per male head. The size of the household tends to be a greater function of labour requirements for farmwork than reproduction, as most female heads may have exceeded child bearing age.

FAMILY ORGANISATION AND NATIVE LAW

According to native law, the extended family is a normal unit of the social institution it protects. Human exploitation by others is normalised by the fact that the exploited accept the system and form part of it. The binding factor in such a system concerns mutual protection; the common interest amounts to production for sheer survival. When a member of the unit is involved in a court case to an extent that the common interest of the group is endangered, then all members are worried. In other words, the fate of one member spells that of another.

The close relationship between the law and family organisation is illustrated by a study of types of court cases in four Bombali chiefdoms in 1970 (Table 3.2). In all four chiefdom courts, 23·6% of the 543 court cases involved what is commonly known as "woman palaver" or "woman damage". These are complex marital matters like adultery, beating of wives, witchcraft accusations on concubines and a host of others. Nearly half of the court cases concern debts payable in kind or cash. Most of these seem rather petty - small quantities of rice, palm oil, chicken or small amounts of money. Land cases account for 13·1% of all legal proceedings in this particular year.

The interesting point about courts and families is with respect to total family involvement. About 80·5% of all court cases have direct implications for the group rather than the individual. No debt in kind can be repaid from farm produce without the approval of the family head. Most times pledges of family property are made to clear a family member from one court case or the other. The survival of the extended family is constantly maintained by reducing legal battles to a minimum. Cases within the family are settled by the head. Those involving members out of the group are resolved through careful bargaining. The village headman is therefore as important as the magistrate. By settling most inter-family disputes much time is saved from lengthy court sittings at the chiefdom town.

Table 2.2 Types of court cases in four Chiefdom Courts, January-December, 1970

Chiefdom Court	Woman Palaver	%	Debts	%	Land cases	%	Others	%	Total
Kamalo	55	33.3	43	26.1	33	20.0	34	20.6	165
Fintonya	30	35.3	38	44.7	5	5.9	12	14.1	85
Makeni	12	8.0	97	64.7	13	8.7	28	18.7	150
Kamakwie	31	21.7	60	42.0	20	14.0	32	22.4	143
	128	23.6	238	43.8	71	13.1	106	19.5	543

Table 2.3 Major occupation group of working population, 1963

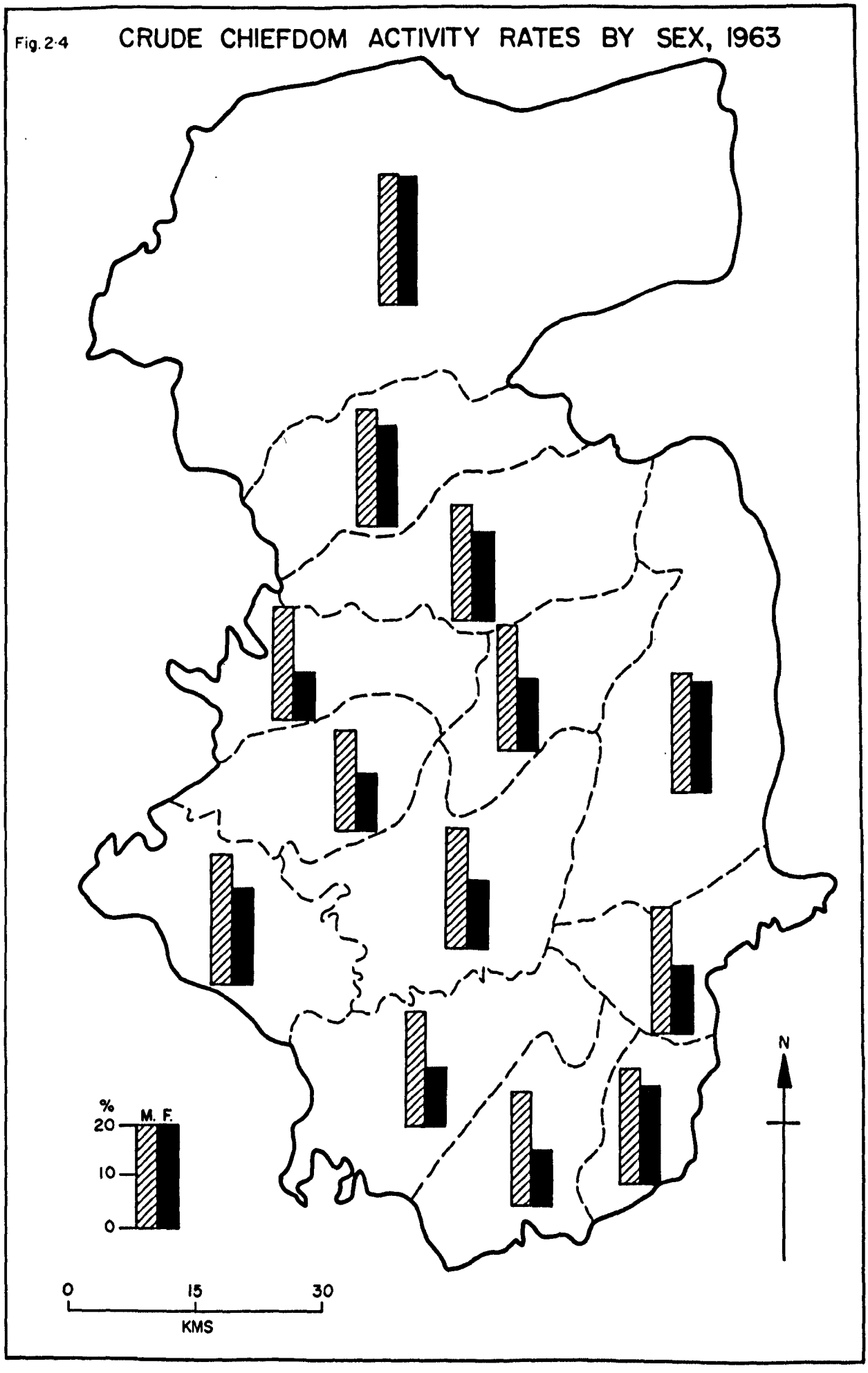
Occupational group	District Total	%	Male	%	Female	%	Male 60%+	Female 30%+
Professional, Technical	561	.79	434	77.36	127	22.64	✓	
Managerial, Admin., Exec.	87	.12	85	97.7	2	2.3	✓	
Clerical	145	.2	136	93.7	9	6.3	✓	
Sales	2,250	3.19	1151	51.16	1099	48.84		X
Farmers, Fishermen	63,620	90.11	36536	57.4	27084	42.6		X
Miners, Quarrymen	47	.07	47	100.00	-	-	✓	
Transport, Communications	397	.56	396	99.75	1	.25	✓	
Craftsmen, Labourers	3,065	4.34	2495	81.4	570	18.6	✓	
Service, Sport	434	.61	414	95.39	20	4.61	✓	

Source: Government Printer, 1964, Sierra Leone Census, 1963, Freetown

✓ Male > 60% Labour force

X Female > 30% Labour force.

Fig. 2·4 CRUDE CHIEFDOM ACTIVITY RATES BY SEX, 1963



FAMILY ORGANISATION AND LABOUR

Four characteristics tend to sum up the situation of labour and productivity in the district. The working population is predominantly agricultural, female participation in productivity is high even though limited to some occupational types. Tertiary activities are highly centralised and the migrational habits of the gainfully occupied are differential in sex and age. A classification of the working population in Bombali establishes the essentially primary, if not peasant, nature of productivity (Table 2.3). Agriculture and fishing account for 90% of the working population.

The female working population is largely concentrated in farming and sales, but this does not obscure the relatively high level of its overall participation in productivity. A rough index of this is the Crude Activity Rate, by sex, expressed as the percentage of active male or female population to the total population of a given region or country. In Bombali there is a female CAR range of 9·3 to 23·7 compared with a male of 18·3 to 23·9 (Table 2.4). Female participation accounts for more than 30% of the working population. Variations do occur at chiefdom levels, and these reflect varying attitudes of people towards work, limitations imposed by mass illiteracy on alternative work opportunities (Fig. 2.4).

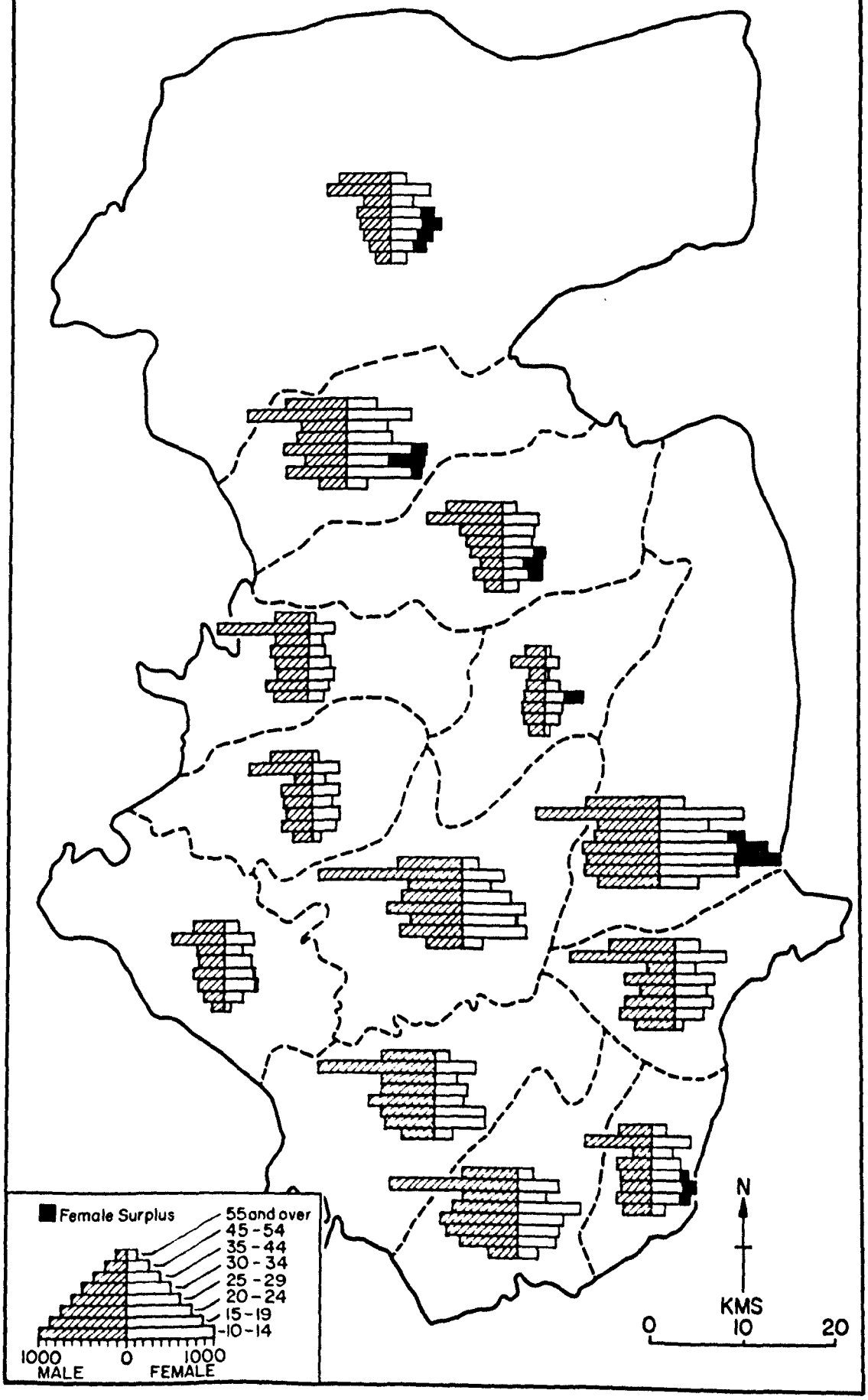
Some chiefdoms where CAR values by sex tend to be even have been identified as source regions of out-migrants,

Table 2.4 Crude chiefdom activity rates by sex, 1963

Chiefdom	Total population	Labour force	CAR	Male	Male CAR	Female	Female CAR	Chiefdom CAR as % district
Biriwa	24,546	10,257	41.78	5,357	21.82	4,900	19.96	5.16
Sebora	22,078	6,953	31.49	4,701	21.29	2,252	10.2	3.5
Gbanti Kamaranka	13,921	4,271	30.68	2,975	21.37	1,296	9.3	2.1
Libeisaygahun	8,384	3,486	41,57	1,996	23.8	1,490	17.78	1.75
Magbaimba	6,124	2,230	36.41	1,439	23.5	791	12.92	1.1
Makari Gbanti	19,696	6,515	33.08	4,229	21.47	2,286	11.61	3.28
Paki Masabong	11,277	4,491	39.82	2,434	21.58	2,057	18.24	2.25
Gowahun	22,141	7,627	34.45	4,829	21.81	2,798	12.64	3.84
Safroko Limba	16,612	5,764	34.7	3,702	22.29	2,062	12.41	2.9
Sanda Tenraren	12,922	3,696	28.6	2,365	18.3	1,331	10.3	1.86
Sanda Lokko	12,528	4,797	38.29	2,719	21.7	2,078	16.59	2.41
Sella Limba	18,763	7,588	40.44	4,062	21.65	3,526	18.79	3.82
Tambakha	9,784	4,655	47.58	2,339	23.91	2,316	23.67	2.34

Source: Central Statistics Office 1964, Sierra Leone Census Report 1963, Vol. 3, Government Printer, Freetown.

CHIEFDOM AGE-SEX PYRAMIDS OF WORKING POPULATION 1963
Fig 2·5



(Forde & Harvey, 1969, 19). In eight of the thirteen chiefdoms, a female surplus of the working population occurs between the ages of 20 and 34 (Fig. 2.5). Other workers have identified reasons for the inbalance - the drift to the mining areas (Adeokun, 1969; Gamble,1967,15), job opportunities in bigger towns, education and casual visits (Turay, 1967). The effect of migration on the survival of the extended family leaves ample scope for further research. When peasants are exposed to cash economies, incentives for higher productivity and better living standards are absorbed and this results in a new wave of action. "The extended family gradually breaks as the migrants stay for longer periods from home, the nuclear family becomes more functional" (Wolf, 1966, 71).

HOUSEHOLD INCOMES

The assessment of family incomes in peasant communities is a major obstacle in rural development studies. The basic problem stems from the fact that farm operations are not expressed in terms of expenditure and returns, neither is labour remunerative in cash. Moreover banking is not a common practice. Estimates of farm operation costs and returns are therefore the result of concerted efforts of more specialised agencies like the Central Statistics Office (CSO) and the FAO Agency for Integrated Development of the Agricultural Sector (IDAS).

The level of accuracy in costings is subject to criticism especially when complex quantitative data on domestic

and farm expenditure are required in questionnaires from illiterate peasants. Experience has proved that herdsmen do not know how many head of cattle they have. Even if they know, one finds the same sort of taboo as with the peasant cultivator, who upholds the traditional tenet that it is forbidden to count the number of cash crop trees or yields in a farm. To achieve any level of accuracy in cost analysis, the fieldworker must be ready to experiment and reduce the objectives of data collection to some reasonable minimum.

For rural communities the IDAS approach comes closest to experimentation (Mitra, 1969). Here objectives are limited to typical farm activities. Cash values for inputs like labour and farm produce have standard rates, thus reducing errors on estimates while still containing the basic information required in cost analysis. The more complex CSO questionnaire approach is probably more useful in urban areas where people are usually more responsive.

The average acreage per family farm in most parts of Bombali is 4·82 (Mitra, 14). A typical family operating on 4·5 acres, the majority of which is under upland and swamp rice (Table 2.5), normally has little interest in other crops. These are the responsibility of female cultivators who raise them around the compound. The upland rice farm is intercropped with maize, pigeon peas, guinea corn and beniseed (Mitra, 14; Turay, 75). Other crops like groundnuts, potatoes, cassava, millet and guinea corn form tiny

aggregates of the farmland, usually less than an acre. The main pre-occupation is therefore rice farming and other crops are dietary supplements for marketing.

Table 2.5 Mean crop acreage per farmer family

Crop type	Acreage
Mixed upland rice	2·63
Groundnuts	·17
Upland maize	·13
Sweet potatoes	·15
Cassava	·21
Guinea corn and millet	·17
Swamp rice	1.04
Total	4.5

Where labour cost is considered remunerative in cash, returns to management of a family farm amounts to a deficit of Le 36·05 (£18.025), if government tractor schemes are not used (Table 2.6a). In a situation where tractor services are used in swamp land cultivation, returns will increase with a smaller deficit of Le 11·61 (£5.8). The cost of labour in the first case accounts for 87·07% of the total expenditure compared with 78·59% in the second (Table 2.6b).

Since labour is derived from members of the family in both cases, this cost element is added to farm returns to

Table 2.6a Case I: Expenditure and returns of family farm operation with no mechanisation, 1969 (in Leones)

Crop	Total expenditure	Labour	Current value of produce	Returns to management
Mixed upland rice	94.44	80.35	75.77	- 18.67
Upland groundnuts	2.73	2.09	2.51	- .22
Upland maize	1.33	1.14	1.27	- .06
Sweet potatoes	3.91	3.51	3.61	- .3
Cassava	6	4.16	3.02	- 2.98
Guinea corn and Millet	1.56	1.33	1.28	- .28
Swamp rice (transplanted)	43.33	40.9	29.79	- 13.54
Total	153.3	133.48	117.25	- 36.05

Table 2,6b Case II: Expenditure and returns of family farm operation with swamp mechanisation, 1969 (in Leones)

Crop	Total expenditure	Labour	Current value of produce	Returns to management
Mixed upland rice	99.44	80.35	75.77	- 18.67
Upland groundnuts	2.73	2.09	2.51	- .22
Upland maize	1.33	1.14	1.27	- .06
Sweet potatoes	3.91	3.51	3.61	- .3
Cassava	6	4.16	3.02	- 2.98
Guinea corn and millet	1.56	1.33	1.28	- .28
Swamp rice (mechanical)	30.64	17.92	41.54	10.9
Total	140.61	110.5	129	- 11.61

obtain positive balances of Le 97·43 (£48.72) and Le 98·89 (£49.45) for Cases I and II respectively. Considering the impact of social demands on such tiny returns, there is hardly any capacity to save. Some tentative observations of incomes of farmer families do not reflect the relatively small acreages and the little effect government mechanisation schemes tend to have on traditional farming. The size of the farm labour force, the basis for large families can only result in a situation of subsistence productivity.

FAMILIES IN LARGER TOWNSHIPS (MAKENI AND KAMAKWIE)

Slight variations in family patterns and incomes are observable in these two largest centres (CSO, 1969); but such variations are not large enough to be of great impact on their hinterlands. For example, in a detailed classification of household types in Makeni and Kamakwie, five principal family types are identified by the Central Statistics Office, and these are the husband and wife family; the multiple wives type; the one parent family; single or unrelated persons; and others. A close examination of this classification reveals the same basic family patterns observed in the villages - extended, nuclear and one parent families (Table 2.7). A clear differential between village and town family patterns is the more complex structure of the family units in the latter case. In Makeni, 23·3% of all families are nuclear, 53·9% are extended. In Kamakwie, 39·7% are nuclear, 42·8% are extended.

Table 2.7 Percentage distribution of households by family types in Makeni and Kamakwie, 1969

Type of household	Makeni	Kamakwie
A. Husband and wife		
1. with wife only	4·2	6·3
2. with children only	13·5	30·2
3. with children and relatives*	16·3	19·0
4. with others and relatives*	2·8	9·5
B. Multiple wives*		
1. with children	6·5	7·9
2. with children and relatives	11·6	3·2
C. One parent		
1. with children	5.6	3·2
2. with children and relatives*	7·4	-
D. Single or unrelated	9·3	3·2
E. All others	22·8	17·5
Total	100.0	100·0
Group I, Nuclear families	23·3	39·7
Group II, Non-nuclear (extended families)	44·6	39·6
Group III, Single, unrelated, unclassified	32·1	20·7

* Elements of non-nuclear formations.

Source: Central Statistics Office, 1969, Household Survey of the Northern Province Urban Areas, Freetown, 8.

While intertribal marriage is limited even at this micro-urban level, there is a general similarity of tribal family patterns (Table 2.8). The mean percentage of nuclear families in all urban centres of the Northern Area is 40·4% while the extended families account for 41·8% (CSO,1969, 19). The Fullah (38·1%) and Lokko (35·7%) have the highest proportion of nuclear families followed by the Limba (32·1%) and Temne (28·3%). A large proportion of Mandingo families are extended (57·9%) and this is explained by the preponderance of multi-wife households in this tribe. Differences in tribal family patterns are a likely effect of migration - the migrant Fullah and Lokko in Temne (Makeni) and Limba (Kamakwie) towns tend to have smaller families away from home.

Table 2.8 Percentage distribution of households by tribe and family types, 1969

Family type	Temne	Limba	Fullah	Mandingo	Susu	Lokko
Nuclear	28·3	32·1	38·1	21·1	25·7	35·7
Non-nuclear(extended)	42·0	47·0	40·9	57·9	37·2	39·3
Others	29·7	20·9	21·0	21·0	37·1	25·0

Source: Central Statistics Office, 1969, Household Survey, Northern Province - Urban Areas, Freetown.

Incomes in Makeni and Kamakwie are generally higher than those of other rural families in the district. The occupat-

Table 2.9 Major occupation groups of working population, Makeni, Kamawie, 1963.

Occupation	Makeni	Kamakwie	Total	District	As % District	District %
Professional & Technical	120	58	178	561	31.7	.8
Managerial, Admin., Executive	33	5	38	87	43.9	.1
Clerical	85	8	93	145	64.1	.2
Sales	812	239	1,251	2,250	55.6	3.2
Farmers, Fishermen	419	467	886	63,620	1.4	90.1
Miners, Quarrymen	7	2	9	47	19.2	.1
Transport, Communication	220	71	291	397	73.3	.6
Craftsmen, Labourers	992	136	1,128	3,065	36.8	4.3
Service, Sport	234	29	263	434	60.6	.6

Source: Central Statistics Office, 1964, Sierra Leone Census Report 1963, Government Printer, Freetown.

ional composition of the working population in these two towns is highly tertiary (Table 2.9). Over 55% of the total district workers in transportation, service and sport, sales and clerical sectors are concentrated in these two townships where workers in agriculture account for less than 2%. Families are less dependent on farm incomes though essentially communal in outlook.

Places of work for family members are now numerous in the urban centres, and the financial responsibility of the househead tends to increase. Other members of the household contribute towards the household purse in cash (Table 2.10).

Table 2.10 Mean individual contribution to monthly household income, Makeni, 1969

Relationship to household	Contribution to household income	%
Head	£ 16·5	74·1
Wife	1·37	6·1
Children	·48	2·1
Other relatives	1·45	6·5
Non-relatives	2·52	11·2
Total	22·41	100·0

Source: Central Statistics Office, 1969, Household Survey of the Northern Province - Urban Areas, pp.91.

The average monthly income of a family at Makeni, for example, is Le 44·82 (£22·41) compared with about Le 16 (£8)

in the rural areas. A farmer family earns £10·55 per month or £126·06 per annum at Makeni compared with a village peasant with £90 to £100. This difference in income between village and town is more related to variations in living standards rather than the capacity to save.

SOCIETAL NORMS

The peasant in Bombali observes certain norms generally accepted by most peasant communities in the country. Among a host of such norms are a respect for old age, the secondary position of women in decision making, the preparation of young adults to manhood through initiations to secret societies and the communality of family property. Variations of attitudes towards these norms can be numerous in a region like Bombali where the peasantry and typical family are tribal in structure and outlook.

(i) Tribal intermarriages and inheritance:

In the sample of 1,125 family heads (Appendix 2.1) only six are of mixed tribal marriage. In the Kamakwie area two Susus have Limba wives. In Bendembu two Mandingo and a Mende have Lokko wives. These six family heads are strangers trading in Limba and Lokko chiefdoms. They have acquired land rights by indirect inheritance from their wives, but none of these men is particularly interested in farming. What is probable is that while intermarriage is rare it is also very selective, generally favouring petty trading tribes that are not interested in land exploitation. Gamble

is more conclusive about this trend in Kenema:

> "...the most cosmopolitan element of the population is a section of the trading community among whom the Mandingo, Susu and Fullah are most prominent."
>
> (Gamble, 1967, 20).

In situations where village intermarriages occur at the tribal level, it is the females who leave their places of birth for new homes (Turay, 55). Offspring of such marriages therefore have strong paternal affinities and this is reflected by the strongly paternal basis of inheritance. According to Table 2.11, 77·3% of all land claims tend to be paternal. Gifts or land grants from Chiefs and village heads account for 11·4% of all land claims. Casual squatting and ultimate occupation is even more common than maternal claims. The family is thus a closed social unit constantly guarding against infiltration to family property through marriage. The legal basis of inheritance is questionable but the logic behind it sustains the family structures - land and property must transcend the generation and persons outside the tribal unit must not exploit it or further complicate the system.

(ii) Myths

One common element in most peasant communities is the close affinity of the natural to the supernatural. In Bombali such a relationship has a tribal expression in secret societies. For example, the Temne are members of the 'Poro' society, while the Limba, the 'Gbamgbani'. From

Table 2.11 Basis of land inheritance rights, 1971

Area	Sales	%	Paternal	%	Paternal & Maternal	%	Maternal	%	Squatting	%	Gifts	%
Kamakwie (Limba/Susu)	-	-	58	53.2	6	5.5	19	17.4	2	1.8	24	22
Kamalu (Temne/Lokko)	1	2.6	18	46.2	-	-	2	5.1	5	12.8	13	33.3
Kamaranka (Temne/Fullah)	-	-	25	52.1	-	-	3	6.3	6	12.5	14	29.2
Binkolo/Kamabai (Limba)	1	.1	655	90	26	3.6	1	.1	22	3.0	23	3.2
Makeni/Masomgbo (Temne)	-	-	58	73.4	-	-	8	10.1	1	1.3	12	15.2
Kalangba/Bendembu(Lokko)	2	1.6	56	45.9	7	5.7	6	4.9	9	7.4	42	34.4
Total	4	0.36	870	77.3	39	3.47	39	3.47	45	4.0	128	11.38

these differences stem variations in interpretations of institutional functions within the society. For example, the traditional Limba chief is chief of people rather than of a precisely bounded territorial chiefdom (Finnegan, 1965, 89); an idea that ties up very well with the concept of the common family origin of the Limba gods in the 'Gbamgbani'.

The natural consequence of these differences, little though they may seem, is the limited inter-village communication between chiefdoms. Migrants tend to move from places of birth to tribal chiefdom towns from whence they move to Freetown. This pattern of contact limitation is blindly encouraged by the administration. Tribal chieftaincies are established in urban areas like Bo, Kenema, Freetown and Makeni where migrant tribesmen regroup themselves to form mushroom tribal villages within what is generally accepted to be urban.

FAMILY STRUCTURES IN RURAL DEVELOPMENT

To many political leaders in developing countries, extended families and their attendant cultures bring powerful reinforcement to the carrying out of contemporary development plans (Drake, 1960, 151). Implicitly the traditional family is accepted as an advantage rather than an obstacle to development. Specialists in this field have constantly opposed this view. Hauser observes that traditional value systems do not provide the population with

incentive for material gain or expectations of advancement based on merit and application. Amongst cultural restraints to technological advancement Hauser lists the emphasis on spiritual rather than material values; the pressure for conformance with, and often intolerance with deviations from, traditional patterns of thought and action; the relatively rigid definitions of roles of members of the family; and the parochialism of the diverse social, ethnic and territorial groups (Hauser, 1959, 81).

The apparent conflict of opinion over the role of the family stems from differences in development policy implementation. Rational approaches to problems related to development have been less meaningful to unstable administrations. The sensational, though meaningless, is more intensively utilized. Phrases like "African Socialism" have often been used where an administration is too weak to eradicate traditional restraints to progress, and yet too uplifted to accept its incapacity.

In Bombali, the family unit is still traditionally tribal and large. Productivity is at subsistence level and decision making is still in the hands of the aged. Observed changes of peasant attitudes towards ownership and household sizes are elements of hope for a brighter future. Such changes are associated with population mobility, for as soon as migrant peasants turn into wage-labourers the likelihood that nuclear families will prevail increases vastly (Wolf, 1966, 71). In Bombali this gradual break up of the family

Table 2.12 Orientation of family heads towards nuclear units, 1971

Village	No. of heads	Size	Accepting Nuclear units	%
Bendembu	134	6	15	11.2
Marampa	14	2	7	50.0
Mafaray	13	2	5	38.5
Maforay	7	1	5	71.4
Kagbumgbo	9	1	5	55.6
Kapete	11	2	5	45.5
Kamaranka	59	4	16	27.1
Kalangba	72	5	54	75.0
Rogbin	71	5	52	73.2
Kakola	11	2	8	72.7
Mabunyele	5	1	1	20.0
Romurthe	33	3	4	12.0
Kamakwie	75	5	34	45.3
Kamafufay	8	1	4	50.0
Kamagbonso	5	1	1	20.0
Kamabai	77	5	36	46.8
Samaya	25	3	7	28.0
Kamalo	120	6	37	33.8
Binkolo	85	6	45	52.9
Mabonkani	29	3	14	48.3
Makeni	69	5	35	50.7
Kamasaramankay	4	1	3	75.0
Kamakubuna	4	1	-	-
Falaba	2	1	-	-

to a nuclear system has been observed in different situations. In a survey of family head responses to changes in household sizes each head was asked to indicate what members of the unit have rights to their property when they die. Answers to such questions offer a fair indication of changes in concepts (Table 2.12) and one discerns some pattern of change in several villages.

Like migration, changes in concepts of household size are probably more affected bynsituations of dense farm population than by the presence of chiefdom townships. A Spearman's rank correlation of farm population densities with tendencies towards nuclear families gives a positive value of $r_s = \cdot 45$ at a 95% confidence level (Table 2.13a). Similar correlations of this change with settlement size (Table 2.13b) and total population densities (Table 2.13c) have lower r_s values of $\cdot 11$ and $\cdot 25$ respectively. The attendant problems of such a situation can be mass disillusion, the emergence of a landed and landless society. Such problems may well be associated with the upsurge of individual incentives for maximised productivity. The important fact is that the family is changing and it is this vital element that spells some hope for economic progress.

Table 2.13a Rank correlation of farm population density and orientation to nuclear units, 1971

Town/village	Density size (in ranks)	Orientation to nuclear units (in ranks)	d	d^2
Bendembu	10	22	12	144
Marampa	16.5	9.5	7	49
Mafaray	22.5	15	7.5	56.25
Maforay	13.5	5	8.5	72.25
Kagbumgbo	8.5	6	2.5	6.25
Kapete	22.5	13	9.5	90.25
Kamaranka	21	18	3	9
Kalangba	2	1.5	.5	.25
Rogbin	11.5	3	8.5	72.25
Kakola	13.5	4	9.5	90.25
Mabunyele	15	19	4	16
Romurthe	11.5	21	9.5	90.25
Kamakwie	1	14	13	169
Kamafuyay	7	9.5	2.5	6.25
Kamagbonso	19	20	1	1
Kamabai	5	12	7	49
Samaya	24	17	7	49
Kamalo	4	16	12	144
Binkolo	3	7	4	16
Mabonkani	16.5	11	5.5	30.25
Makeni	6	8	2	4
Kamasaramankay	8.5	1.5	7	49
Kamakubuna	19	23.5	4.5	20.25
Falaba	19	23.5	4.5	20.25
				1254

$\Sigma \bar{x} = 1.5, \quad \Sigma x^2 = 1148.5$

$\Sigma \bar{y} = 6, \quad \Sigma y^2 = 1144$

$$r_s = \frac{1148.5 + 1144 - 1254}{2\sqrt{1148.5 \times 1144}} = \frac{1038.5}{2292.5} = .45$$

where $$r_s = \frac{\Sigma x^2 + \Sigma y^2 - \Sigma d^2}{2\sqrt{\Sigma x^2 \Sigma y^2}}$$

Table 2.13b Rank correlation of settlement size and orientation to nuclear family

Town/village	settlement size (rank)	orientation to nuclear family (rank)	d	d^2
Bendembu	6	22	16	256
Marampa	18	9.5	8.5	72.25
Mafaray	18	15	7	49
Maforay	18	5	13	169
Kagbumgbo	18	6	12	144
Kapete	18	13	5	25
Kamaranka	6	18	12	144
Kalangba	6	1.5	4.5	20.25
Rogbin	6	3	3	9
Kakola	18	4	14	196
Mabunyele	18	19	1	1
Romurthe	18	21	3	9
Kamakwie	2	14	11	121
Kamafufay	18	9.5	8.5	72.25
Kamagbonso	18	20	2	4
Kamabai	6	12	6	36
Samaya	10.5	17	6.5	42.25
Kamalo	6	16	10	100
Binkolo	6	7	1	1
Mabonkani	10.5	11	.5	.25
Kamasaramankay	18	1.5	16.5	272.25
Kamakubuna	18	23.5	5.5	30.25
Falaba	18	23.5	5.5	30.25
Makeni	1	8	7	49
				Σ1853

$$\Sigma \bar{T}x = 1.5, \quad \Sigma x^2 = 1148.5,$$
$$\Sigma \bar{T}y = 210.5, \quad \Sigma y^2 = 939.5,$$

$$r_s = \frac{1148.5 + 939.5 - 1853}{2\sqrt{1148.5 \times 939.5}} = \frac{235}{2077.51} = .113$$

where $r_s = \dfrac{\Sigma x^2 + \Sigma y^2 - \Sigma d^2}{2\sqrt{\Sigma x^2 \Sigma y^2}}$

Table 2.13c Rank correlation of population density and orientation to nuclear family

Town/village	Population density (rank)	Orientation to nuclear family (rank)	d	d^2
Bendembu	8	22	14	196
Marampa	22.5	9.5	13	169
Mafaray	6.5	15	8.5	72.25
Maforay	16.5	5	11.5	132.25
Kagbumgbo	13.5	6	7.5	56.25
Kapete	6.5	13	7.5	56.25
Kamaranka	15	18	3	9
Kalangba	5	1.5	3.5	12.25
Rogbin	10.5	3	7.5	56.25
Kakola	16.5	4	12.5	156.25
Mabunyele	18	19	1	1
Romurthe	10.5	21	10.5	110.25
Kamakwie	2	14	12	144
Kamafufay	12	9.5	2.5	6.25
Kamagbonso	20	20	0	0
Kamabai	3	12	9	81
Samaya	24	17	7	49
Kamalo	9	16	7	49
Binkolo	4	7	3	9
Mabonkani	22.5	11	11.5	132.25
Makeni	1	8	7	49
Kamasaramankay	13.5	1.5	12	144
Kamakubuna	20	23.5	3.5	12.25
Falaba	20	23.5	3.5	12.25
				1715

$\Sigma \bar{x} = 1.5, \quad \Sigma x^2 = 1148.5$

$\Sigma \bar{y} = 9, \quad \Sigma y^2 = 1141$

$$r_s = \frac{1141 + 1148.5 - 1715}{2\sqrt{1141 \times 1148.5}} = \frac{574.5}{2289.49} = .25$$

where $r_s = \dfrac{\Sigma x^2 + \Sigma y^2 - \Sigma d^2}{2\sqrt{\Sigma x^2 \, \Sigma y^2}}$

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CHAPTER III

LAND USE AND TENURE

INTRODUCTION

There is no ideal approach to the study of land use and tenure in tropical Africa. Much of what has been done in studies of these aspects is of a general nature. Methods of approach from generalisations of such a complex and little documented system of human organisation have tended to be simple applications of theory to localised studies. The human element in rural land use studies has been less emphasised. Floyd's conceptualisation of land use in tropical Africa is a singular exception. In this recent study, the importance of structuring geographical methods is implicit (1972). For him the farm is a focus of study which is related to all other aspects of the environment (3). The farm is then 'humanised' as its focal position is replaced by 'decisions affecting farming systems' in a second model which concerns farmers' perception of the physical and cultural environment (14). Deviations of the shifting cultivator's farm from the modern are observed and the geographer is able to recognise and explain local underdevelopment.

The sociologist can examine land tenure and explain its structure in relation to family organisation (Pitkin, 1959, 169). This approach describes socio-economic factors operating in a given peasant community but omits physical

factors which are equally related to this level of land exploitation. Some sociologists have braved more to explain the spread of rural settlement through migrations of families and ethnic groups. The social stratification of farm and founder village may be explained in this way, but its functional impact cannot be fully appreciated without spatial dimensions. For example, in her study of the Limba people of Northern Sierra Leone, Finnegan observes that each important Limba town has around it a ring of perhaps seven or eight villages connected to it by bush paths which it 'owns' as being the original settlement (1965, 60). On land tenure, she concludes that the system cannot be described in economic terms but in terms of rights and obligations with social, political and ritual as well as material aspects (89). The central idea in this conclusion suggests a multiplicity of influences affecting peasant organisation.

Oluwasanmi, an agricultural economist, describes land tenure as the study of the interrelationship between men in the use and control of land resources, and an aspect of the legal and political systems of a society. For him, land tenure represents a stage in the evolution of the economic and social institutions of a country (1966,23). A few questions spring from such apt definitions - for example it will be interesting to discern stages in the evolution of land tenure practices, the legal basis of ownership, size, location and type of land under exploitation. These are questions which have been left for the sociologist:

> "Sociological fieldwork would need to be carried out district by district in order to discover the nature and extent of land holdings by individuals and families, and which are subject to what indigenous third party rights arising from practices such as borrowing of land, perpetually redeemable pledges of lands, lands held in widely separated villages by members of exogamous lineages and similar other special customs and usages." (194).

Oluwasanmi's suggestions are based on Nigerian experience. For Sierra Leone, Hussain suggests the development of customary land law, the introduction of survey, demarcation and registration of land property, the institution of a machinery for land administration and adjudication, and the organisation of co-operative farming societies (1964, 43). Data on such studies cannot be easily obtained. The rate at which farm land changes from one hand to the other can be seasonal or as fast as the transfer from one rice farm to another fresh piece of bush. The geographer cannot easily map this change and yet, he, among adequately armed researchers in rural land exploitation, seems to have contributed least in this field.

Most development projects and land policies have been introduced in tropical Africa without any depth of knowledge on local variations of tenure and land use. President Senghor of Senegal reverted to traditional African myths

and values as a basis for implementing land policies that will facilitate rural development. His Prime Minister Diouf recalls this new policy in ritual terms:

> "Dans la conception négro-africaine, la terre appartient à la divinité, aux génies et aux ancêtres. Elle n'est pas susceptible d'appropriation individuelle, et doit servir à la vie de la collectivité. Ainsi, le paysan Sénégalais n'en a que l'usufruit et un droit d'occupation"(1971, 4).

The dependence on tradition to resolve modern problems is a simple means to an end, but does not offer an objective solution to current land problems.

The time-scale problem of relating land use to ownership beyond the built up zone has often driven workers to isolated studies of either settlement, land use or tenure. In development studies, however, an interrelation of these three aspects is of vital importance. The main elements in such an interaction are man and land at any defined stage of development. The implication here is that one understands land characteristics - both physical and human, which are generators of localised reactions to changes in accepted concepts of land use and tenure.

Gamble's original study,of two Gambian villages, is one of the earliest contributions to rural land organisation in West Africa. In this study, detailed descriptions of socio-economic and physical characteristics of these

villages are systematically given and the reader is left to build an independent impression of the interaction of cultural, physical and economic factors from which two organised peasant communities have emerged (1954). The apparent basis of study concerns some ability to discern ecological controls of peasant systems.

In the study of Bombali, land use characteristics are examined in relation to physical and cultural controls on land exploitation. An assessment is made of current attitudes of landowners concerning land sales and transfers of freehold rights. Changes in local attitudes are then analysed in relation to observed human and physical limitations to land exploitation. Sample studies in human attitudes revealed changes in tenure concepts, which were localised and related to the size of sample or settlement. Observed changes in tenure concepts are suggestive of changing peasant communities. Since land laws in Provincial Sierra Leone are uniform and unmodified from colonial times, problems of land rights are likely to be directly caused by these laws which are not flexible enough to be adjusted to changing patterns of human distribution and land exploitation.

THE PROCESS OF SETTLEMENT FIXATION

Apart from stories concerning first occupants of a village or farmland there is little visible evidence of limits of land rights in Bombali. Detailed field studies with air photographs, however, are useful guides to early, recent

and extinct locations. In open grassland extinct villages are often associated with isolated circular domes of high forest towering over lower vegetation. These circular forests are easily spotted from air photographs and are distinctly different from existing villages which have a central open section - the built-up area - flanked by a green belt of cash crop trees like the kola nut, mango and orange. Different shades and heights of vegetation suggest different periods of forest or bush clearance. With some general knowledge of local languages, it is possible to eke out information of geographical significance from place names which often describe sites of settlements, their relative age and early functions. For example, a settlement situated on rocky terrain is called "Rogbalan" (Temne) or "Matara" (limba)."Rogbane" (Temne) is a junction settlement or meeting place, "Rogbin" - refuge site of "place of swearing". "Petbana" (Temne) is a large settlement or founder village, while "Petifu" is a "new" settlement. The prefixes "Ro" (Temne), "Ka" (Limba) and the suffix "ya" (Susu) are directional words meaning "to" or "at".

Names of settlements are indicative of scattered human occupance. Consequently the pattern of land use is patchy (Fig. 3.1, oversize, see pocket of thesis). Squatting is still practised in the district but things were probably worse 72 years ago when a government report commented that it was common in Sierra Leone (Blue Book, 1901, A). Tribal conflicts, warfare, the introduction of colonial

administration and religious loyalties all had varying effects on the instability of settlements. In Bombali, internal warfare was so intense that the importation of flint lock guns and common gun-powder was prohibited in four chiefdoms in 1894 - Sanda Lokko, Sanda Tenraren, Gbanti Kamaranka and Magbaimba (Blue Book, 1894, K1). These are chiefdoms with substantial minorities of Fullah tribesmen who were probably migrating from Guinea in large groups during this period.

When the colonial administrators introduced taxation and forced vaccination, people tended to abandon established settlements and new dwellings emerged in more remote locations. During the later part of the Hut Tax War (1896-1898) ravages of the Bai Bureh army were felt as far as Kamalo, a Temne village eight miles from Kamakwie. More recently the Islamic Haidara War which ended in 1935 created more internal movements. A missionary report comments that in 1931 Moslems demonstrated against the government and threatened Christians, scattering the people (The Wesleyan Church, 1969, 11). The gradual crushing of tribal and religious revolts by the colonial administrators probably resulted in a host of other adjustments in settlement location.

The establishment of local administrative centres was followed by the construction of permanent communication links, and this, more than any single factor, determined the present pattern of settlement. In places where good road

links were not developed fast enough, squatting was preponderant, for as a district commissioner put it in 1925:

> "There still lingers in the minds of the old men, the memory of Samery and his raiders who turned this district into a desert, and they even now retain a fear of sowing what they shall not reap." (Slater, 1925, 11).

Probably it was during this period of pacification that a large influx of Fullah migrants settled permanently in this part of the country. It is however certain that motives for tribal pacification were more related to the smooth organisation of subjects rather than the protection of indigenous rights of freehold against Fullah squatters.

Fullah settlers were first attracted towards the new motor roads before spreading to the open woodlands. Large Fullah villages like Matebɔi and Rokulan were founded between 1900 and 1910 and the former was already well established by 1925. The Fullah are predominantly moslems and their role as religious leaders among peasant pagans was a competitive force against early missionaries, to an extent that uncontrolled cattle grazing was accepted as a necessary evil. Intermarriages between the Fullah and other tribesmen gave Islam a stronger footing in the district and today there are sub-ethnic groups like the Sanda-Temne-Fullah and the Lokko-Fullah. This ethnic admixture was to the advantage of the Fullah who had acquired some rights over land. The bargaining position of native landowners is waning

because the Fullah are wealthier, more resourceful and influential. For example, the lineage of chiefs in Sella Limba chiefdom is of partial Fullah descent, so too is that of Sanda Tenraren. The current Fullah chief for the Northern Area resides at Rokulan, 29 miles from Makeni.

Reactions of natives to problems of freehold rights have been mixed. One certainty is that the moslem world knows no internal boundaries. Excluding cropped lands there is no limitation to cattle grazing land. Between December and March the bush must be burnt for fresh pastures to develop. For most Lokko tribesmen, the control of bush fires is beyond their might and the dry season is fast becoming the best hunting period. The Temne are prone to kill stranger cattle caught on farms. The Limba poison streams to catch fish at this time of year and reports of cattle deaths through water poisoning are frequent. The prosecution of cattle killers is difficult because culprits are hardly caught in the act. The Fullah have two alternatives, either settling permanently to practice controlled grazing or moving away from hostile territories. Most of these herdsmen take the second alternative. Incidentally these isolated squatter territories are fallow lands of shifting cultivators (Plate 3.1). While settlement remains unnoticed and temporarily undisturbed cattle are left to graze freely and the expected cover of bush never develops.

SOILS, SLOPE AND ACCESS

The usual tendency of researchers when faced with problems

Plate 3.1. A squatter settlement in central Bombali. Note the small size of the dwellings; their temporary nature reflected by the use of cheap building material from the surroundings - palm leaves and savanna grass for roof thatching; the absence of fixed exit roads. This is an abandoned farm area, the central part of the picture showing some cultivation and beyond the huts to the background, a zone of vegetation regrowth.

of land use competition in shifting cultivation is to vindicate the system as a logical response to the environment. Shifting cultivation in this context means the seasonal change of main crop lot location and may not necessarily mean changes in residence. In Bombali this response is more related to the human than physical environment. It is important at this stage to recall Irvine's observation that shifting cultivation serves as a natural control of pests:

> "At the end of two or three years the farm is abandoned, and any pests or diseases present suddenly find themselves without their 'host' plants and are therefore often checked. In the new piece of bush that the farmer clears there are generally few diseases or injurious insects, and many of them are destroyed when he burns the rubbish before planting his crops" (1956, 29).

Observed farm practices in Bombali indicate localised rotational patterns with no conscientious efforts to protect crops against insects or other diseases. This is essentially a function of farm gods who are appeased before sowing the seed. One therefore wonders whether the farmer realises this possible advantage in shifting cultivation. Certainly, if this were a major reason for shifting, measures of crop protection can be devised. The study of Bombali does not justify patterns of land exploitation; rather it attempts to explain the nature of land tenure through an appraisal of constraints on land use.

a). Soils.

There are three main soil groups in the district - valley bottom soils, terrace and upland soils. Variations in the distribution of these soils are mainly determined by slope and drainage conditions as most parts of the district are of granite and gneissic parent material. The south-western lowlands are mainly composed of valley bottom soils, and where land rises above about 200 feet these soils are replaced by lithosols which account for about 30% of the soils in this region. In the fairly well drained central uplands one finds all three soil groups. Upland soils and lithosols have a wider distribution and account for about half of the soils in this region. Terrace soils form 30% of the topsoils while valley bottom varieties account for 20%. The more hilly region to the east and north-east is mainly composed of upland soils and lithosols (70%) which grade from reddish brown varieties to iron pan concretions and bare rock.

Valley bottom soils are an assortment of alluvial drifts ranging from skeletal deposits to much more mature series. There is a gradation of soil profiles from silts to fine grained shale siltstones weathering in situ (Stobbs, 1963 18). These soils are of relatively high fertility but limited to swamp rice cultivation. Upland terrace soils tend to be more fertile and most suitable for upland crops but these are of fragmented distribution. The least fertile upland soils form the largest single soil group in the

district. These normally survive one or two growing seasons before they are left to fallow.

b). Slope and access:

Of the three main physiographic regions, the most densely settled is the central uplands where one finds a fair combination of all major soil groups. A typical seasonal farm operation involves two or three farm lots - the swamp, terrace and upland. Swamp rice farms provide food for domestic consumption, while upland rice is both for the market and the home. At the peak of the rainy season (July-August), rice is scarce, but cassava and maize are ready for harvest at terrace and upland farms where intercropping is practicable. Before the second growing season, potatoes and cassava are planted on the swamp lots and harvested just before rice is transplanted. A constant food supply is therefore guaranteed, but farm operations involve movements from swamp to terrace and upland (Table 3.1). In smaller settlements the distances involved are under a mile. Swamp land subdivision among village farmers is common and sizes of paddy rice lots tend to decrease with the growth of a settlement's population. Movements to swamp farms may involve longer distances (2-3 miles) beyond which seasonal migration takes place.

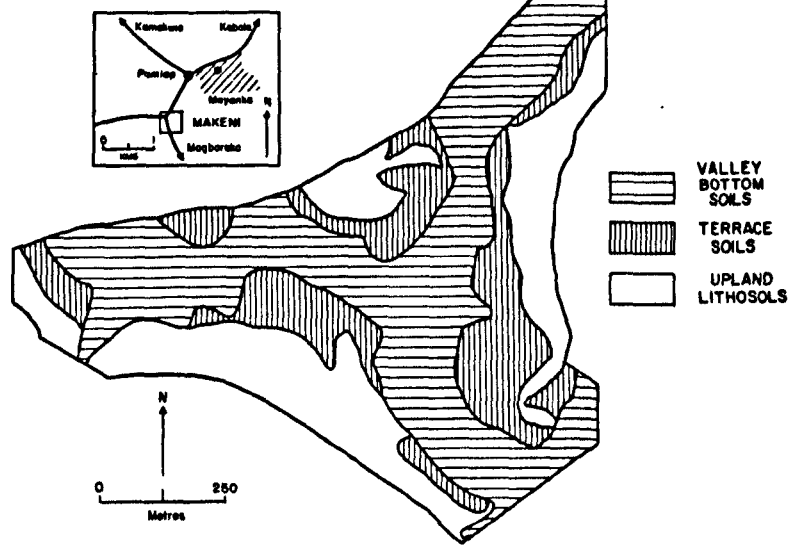
The farmer's migratory habits in search of fresh farmland tend to vary from one soil type to another (Table 3.1). Terrace soils are often marginal to valley bottom soils.

Table 3.1 Fallow regimes in three major soil groups in Bombali district

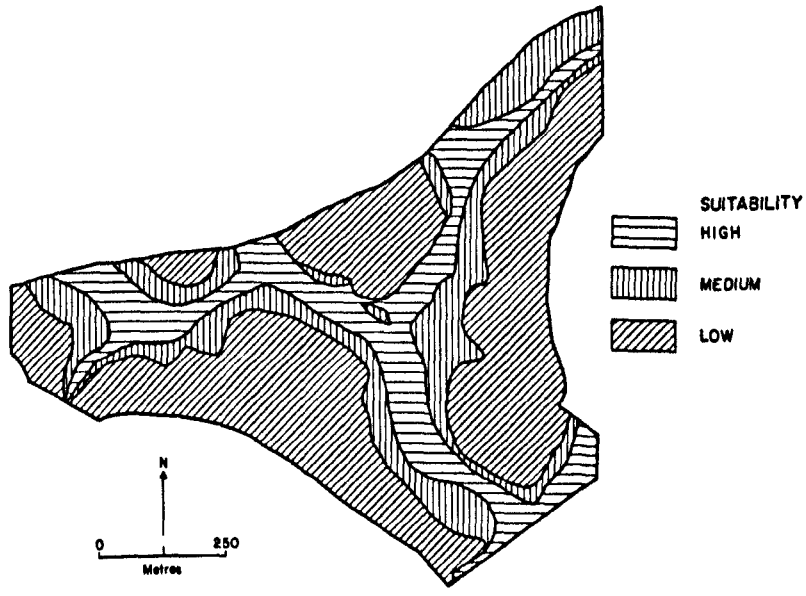
Growing season	Months	Valley bottom soils	Upland terrace soils	Lithosols & upland soils
First	June-October	swamp rice	mixed upland rice	mixed upland rice
Inter-growing season	November-January	potatoes	-	-
Second	June-October	swamp rice	cassava	groundnuts
Inter-growing season	November-January	cassava	potatoes	fallow
Third	June-October	swamp rice	groundnuts	millet
Inter-growing season	November-January	potatoes	cassava	fallow
Fourth	June-October	swamp rice	millet & guinea corn	fallow
Inter-growing season	November-January	cassava	fallow	fallow
Fifth	June-October	swamp rice	fallow	fallow
Inter-growing season	November-January	potatoes	fallow	fallow
Sixth	June-October	fallow	fallow	fallow
Seventh	June-October	fallow	fallow	fallow
Eighth	June-October	swamp rice	upland rice	fallow/upland rice

THE DISTRIBUTION OF SOILS NORTH EAST OF MAKENI Fig 3.2a

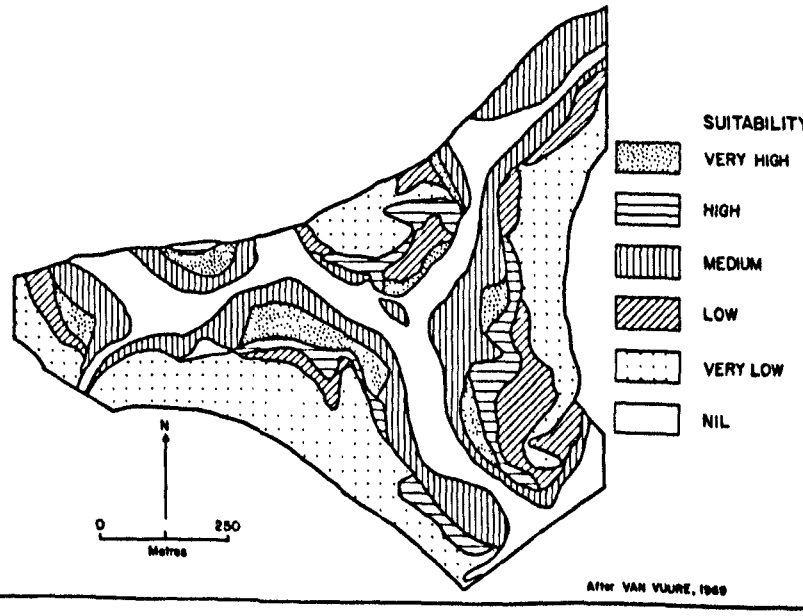
(MAYANKAN AREA)



SOIL CAPABILITY FOR SWAMP RICE CULTIVATION Fig 3.2b



SOIL CAPABILITY FOR GENERAL CROPS Fig 3.2c



After VAN VUURE, 1969

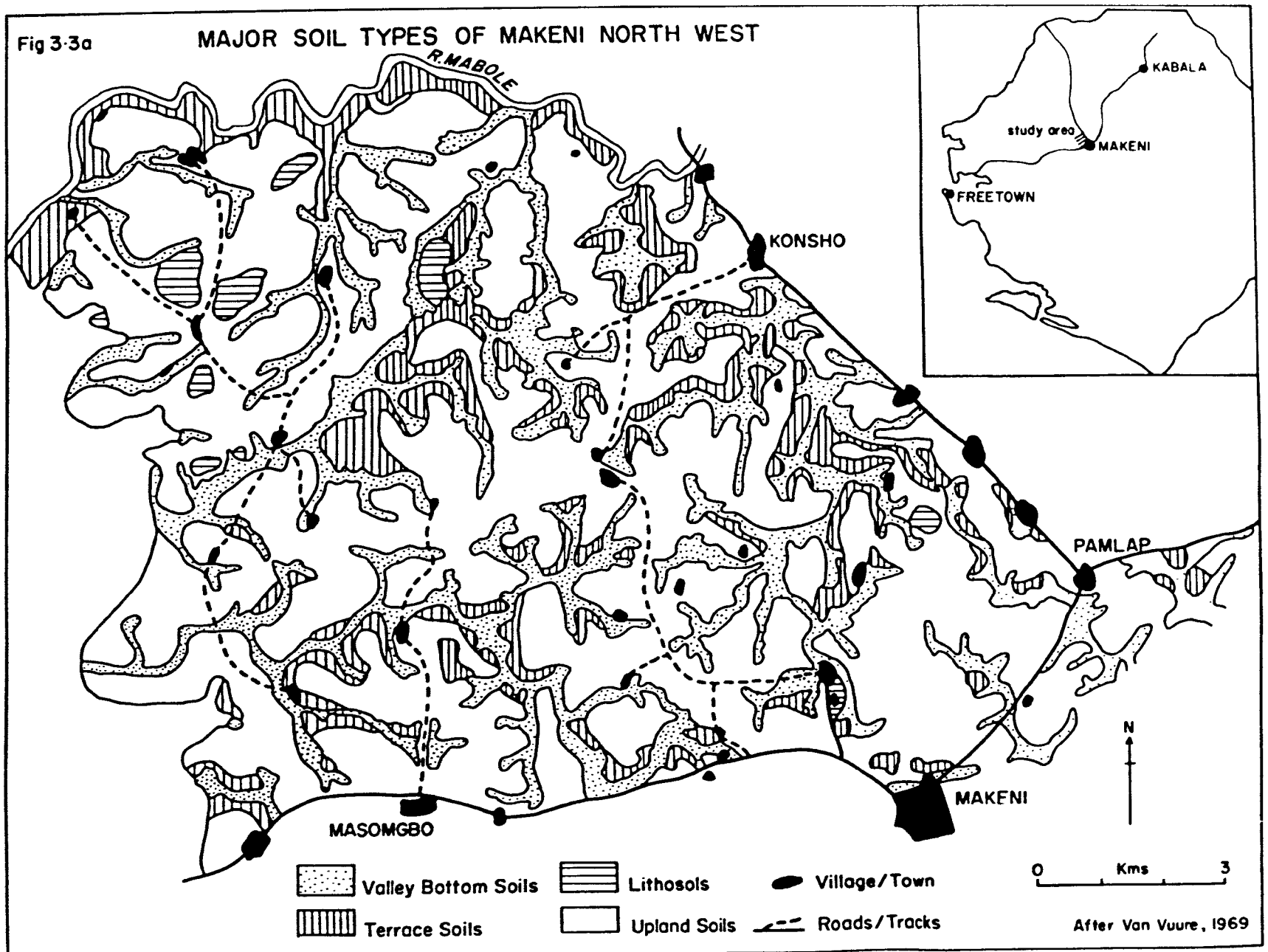


Fig 3·3a
MAJOR SOIL TYPES OF MAKENI NORTH WEST
R.MABOLE
KONSHO
PAMLAP
MAKENI
MASOMGBO
KABALA
study area
MAKENI
FREETOWN
N
0
Kms
3
Valley Bottom Soils
Terrace Soils
Lithosols
Upland Soils
Village/Town
Roads/Tracks
After Van Vuure, 1969

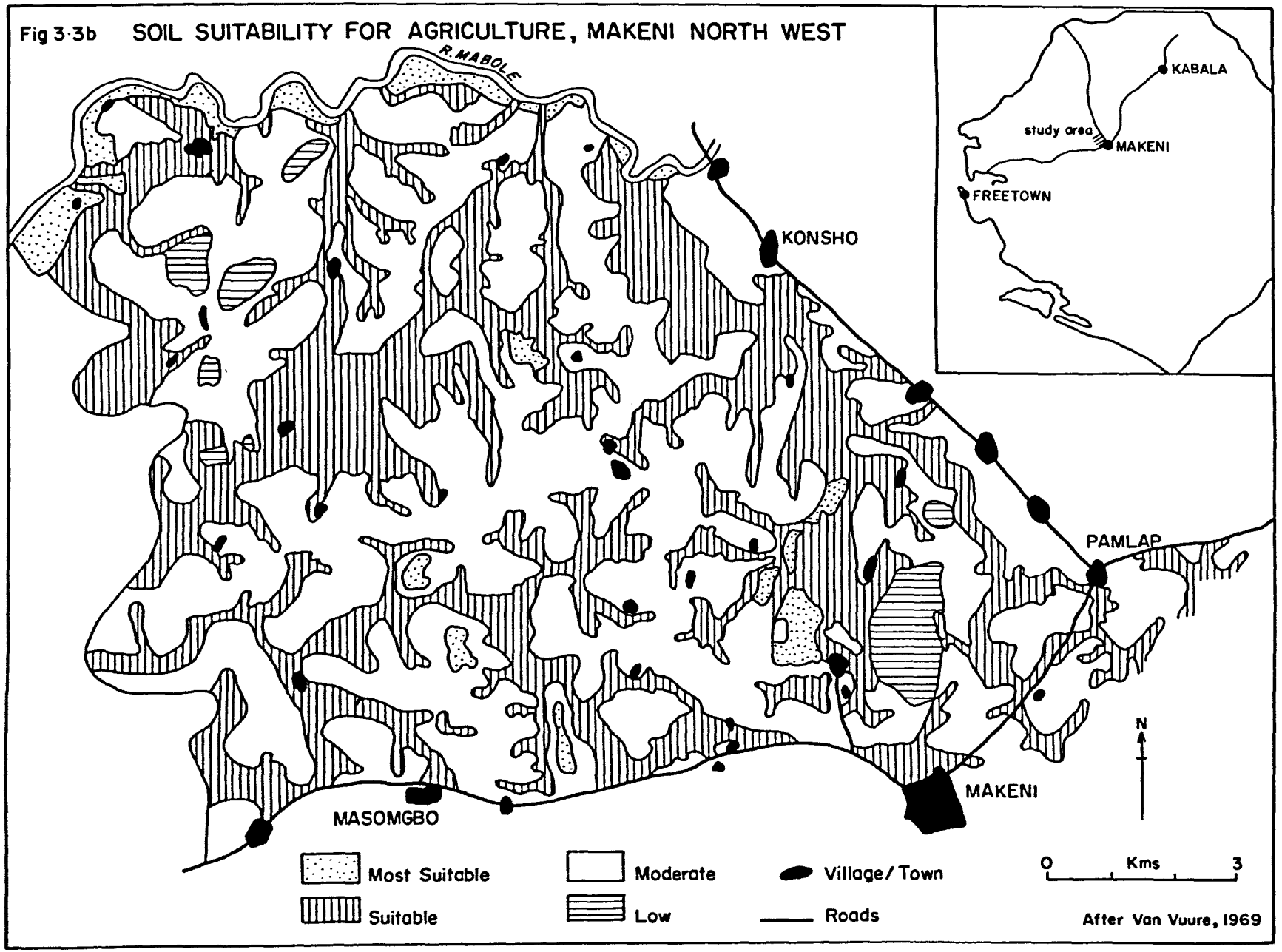


Fig 3·3b SOIL SUITABILITY FOR AGRICULTURE, MAKENI NORTH WEST
R. MABOLE
KONSHO
PAMLAP
MAKENI
MASOMGBO
KABALA
study area
MAKENI
FREETOWN
N
Most Suitable
Suitable
Moderate
Low
Village / Town
Roads
0 Kms 3
After Van Vuure, 1969

The farmer moves further away from his original farmland for a new upland rice plot but he is tied down to his swamp and terrace plots which are tilled for longer periods. Swamp and terrace farms are more valuable to the farmer and are more permanent family possessions. The combination of swamp, terrace and upland operates as a fixation element in settlement. A good example of this pattern of soil and slope combination is found near Mayanka to the north-east of Makeni. In an ideal site for peasant land occupance cropping of all domestic food needs is as important as sources of water supply. The distribution of soil types for Mayanka is shown in Figure 3.2a, land capability characteristics for swamp rice cultivation in Figure 3.2b and for general crops in 3.2c.

North-west of Makeni, along the Lunsar road, settlements tend to be fairly regularly spaced (Fig.3.3a) and generally situated at margins of fertile soils.(Fig. 3.3b). Even where motor roads run across this area the linearity of settlement shape and location does not alter the apparent regularity of distances separating one village from the other. There tends to be some competition of settlements for farmland area. In such areas of dense settlement, swamp and terrace farming are intensified as fallow periods become shorter.

The rocky hills to the north-east present a less complex pattern of land use, as the constraint to settlement and

land exploitation is more rigid. Farming is only possible within the narrow riverain terraces and valley bottoms (Plate 3.2). The general pattern of land exploitation is axial and corresponds with the general trend of rock outcrops, except along the motor roads where a linear formation of built-up area is noticeable. Uncontrolled grazing is a bigger problem here than disputes on individual land rights. Narrow swamp farms are unfenced and these are the easiest sources of drinking water for cattle.

Settlement and land use may be affected by the introduction of a new motor road across a region. In Bombali, villages tend to move to locations along this line of communication for two reasons: a) relative ease of accessibility to other settlements, b) the protection of extended family land from squatters and rival claimants. The dust road from Kamakwie to Kamalo is only eight miles long. This road was constructed between 1925 and 1928. Within a period of 40 years, eight villages have moved to positions along this road. A previous study of the impact of new roads between Rokulan and Kamaranka in the Rogbin area identified about 20 extinct villages (Turay, 1967). These migratory tendencies in settlement produce very complex patterns of land use especially when distance to place of work is beyond three miles.

The general pattern of land use between Kamakwie and Kamalo shows a gradation of grass and bush, punctuated by circular-shaped forests (Fig. 3.4). In densely settled

Plate 3.2. Topographic constraint to land use (Eastern Bombali). The rock outcrop (background) is part of the eastern hills. At the foot of the outcrop an older terrace (left) is cleared for root crop cultivation (cassava, groundnuts, potatoes). Swamp rice (brownish yellow) is ready for harvest on the narrow valley bottom.

THE IMPACT OF ROADS ON LAND USE

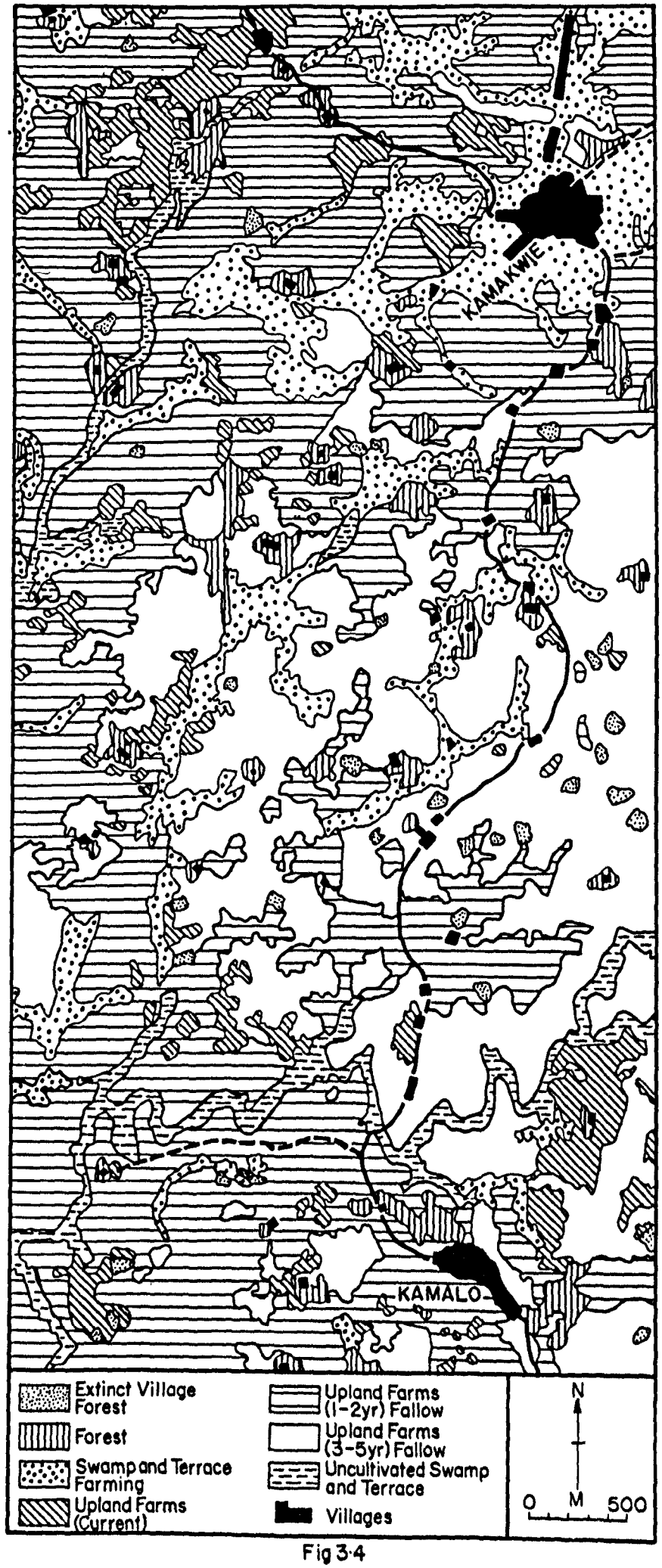


Fig 3·4

towns like Kamakwie and Kamalo there is little forest left. Even the traditional forest belt beyond the built-up area is disappearing. Farming is increasingly rotational around these townships but further away, shifting practices are preponderant. One observes a general absence of virgin forest, a patchy distribution of small, freshly cleared farm plots of various shapes. The large portions of grass and woodland areas are suggestive of some range of three to five year fallows. Some swamp and riverain terrace slopes are yet to be cultivated and the impression of the landscape is suggestive of occupance to assert land ownership.

LAND USE TYPES

The system of land use in Bombali is fairly simple. In a district where agriculture is the main occupation, land exploitation is mainly concerned with needs for farming and the construction of dwellings. There seems to be no ideal sub-classification of land use in shifting cultivation, but a number of geographers have attempted to map localised patterns in tropical Africa: Prothero (ed.) 1972, de Wilde 1967, Hunter 1967, Floyd 1967,1969, 1972; Wills 1962, de Schlippe 1956, Thomas and Whittington (eds.) 1969, Biebuyck (ed.) 1963, and Allan 1965. Details of sequential cropping for specific periods have also been studied (Floyd, 1972, 44). Changes in land use with time are best studied from air photographs and field data. The air photograph is the mean performance of the peasant farmer in exploiting his territory. Each shift from one seasonal clearing

to another is an indirect measure of the rate at which land depletion and vegetation regrowth are progressing, given the ecological conditions of the environment.

The current topographic sheets for Bombali (1970, 1:50,000) are produced by photogrammetric mapping and indicate distribution of vegetation types, rock outcrops, swamp and upland cultivation as well as built-up areas. Actual limits of land use types are not fully indicated though general patterns can be derived. By use of air photographs, field studies and slope analysis it is possible to describe less arbitrary boundaries of land use types in the district (Fig. 3.1). The patterns described in Figure 3.1 are based primarily on photographs taken between 1958 and 1960 when a full coverage of the district was available. Areas of rapid changes in land use are limited to the Boliland region where mechanical cultivation has tended to increase acreages under swamp rice, and in larger settlements where small scale orange plantations are currently being developed. These changes are yet too small and localised to distort the pattern of land exploitation in the district, as a whole.

Areas of high forest account for about 49,200 acres, which is about 2.6% of the total land area (Table 3.2). The estimated forest area in the district is lower than the national average of 4.0%. Low forest and thickets (farm bush) have an approximate acreage of 400,806 acres

Table 3.2 Land use types in Bombali 1958-1960

Type	Approximate Acreage (in '000s)	%
High forest	49·20	2·59
Low forest and thickets	400·81	21·60
Savanna	1,006.00	54·25
Grassland (Mountain Variety)	23·42	1·26
Rock outcrops	7·24	0·39
Swamps	103·08	5·55
Narrow valley swamp cultivation	12·61	0·68
Upland cultivation	222·93	12·01
Built-up areas	29·84	1·67

(21·6 %). These are derived climax varieties found in two fairly large areas - to the south-east and northern margins of the district. Elsewhere their distribution is very patchy except for the rapidly degraded bits south-east of Kamakwie and west of Rokulan (Fig. 3.1).

A greater proportion of district land is under savanna and scrub vegetation (54·25%). In the south and central parts of Bombali this vegetation type has a south-west to north-east trend, forming a wedge between the south-eastern low forest region and the cultivated region to the north-west. In the two east central chiefdoms of Biriwa and Magbaimba, 90% of the land is under savanna and scrub. Beyond

Kamakwie another fairly large band of scrubland tends to separate the low forest region further north from the cultivated regions to the south. There thus tends to be a general progression of forest depletion from areas of dense and more permanent settlement to their hinterlands (Fig. 3.1).

Together with an estimated 12,608 acres of cultivated narrow valley swamps, no less than 6·2% of the district is swamp land. There are about 103,084·8 acres of boli swamps which alone account for 5·55% of the district area. The boli swamps form the most consolidated areas of swamp - beyond them are more isolated and uncultivated depressions to the north contrasting with narrow upland swamps which are of scattered distribution. Predominantly grassy vegetation is associated with high elevation and rocky conditions and in Bombali, grass and rock outcrops account for 1·66% of the land. The built-up area is estimated at 29,843 acres which is 1·7% of the district. In some bigger settlements like Makeni or Kamakwie it is easy to differentiate the built-up area from other land use zones. In smaller villages where the hut is partially enclosed by the foreyard and backyard, it is difficult to estimate actual limits of built-up areas (Plates 3.1, 3.3). For this study, the margin of the backyard nearest to the built-up area has been taken as the outer limit of the built-up area. As the settlement grows there is a tendency for the foreyard to be absorbed within the built-up area.

Plate 3.3. Land use around the built-up area (Northern Bombali). Note the fence on this side view of a living house (left), forming the "bath-room" for the family. Behind the house a canopy of tree crops forms a green belt. Intercropping of groundnuts, maize and potatoes is taking place on the little clearing (centre). When the family size increases, this clearing will be the next construction site for the extended unit.

Upland cultivation accounts for approximately 12·0% (222,900 acres) of the district area. The distribution of farmland tends to be more associated with the pattern of settlement than actual location of cultivable land. One third of the district is over 500 feet high. At this level the land is either too rocky or too steep for upland cultivation without generating erosional problems. It is estimated that about 60 to 65% of district land is suitable for peasant cultivation. While all the cultivated land accounts for about 14% of the cultivable area, 51% of potential farmland is either under fallow, at points of difficult accessibility, or being held by land owning groups that cannot cultivate more than the traditional acreage limits per farmer family. The distribution of land use types is consequently patchy, and if one considers the cattle herder's unmapped movements the pattern is still more chaotic.

DEVIATIONS OF LAND USE ZONES FROM THÜNEN'S MODEL

Changes in farm practices are taking place in the district but shifting cultivation is still preponderant. This traditional form of land exploitation, together with limitations of marginal transport facilities has lured geographers to fit Thünen's concentric zones in tropical land use systems. Work on this apparent similarity has had its moments of success (Horvath, 1969; Siddle, 1970). Departures from the Thünen model are explained by assuming a less homogenous surface around the territory of the settlement.

In Bombali, for example, some settlements are at high elevation, some on slopes further down. Some are along river banks, at river bends and crossing points. Some are at road junctions while others avoid marshy conditions (Fig. 3.1). Even when all these conditions are considered there are local patterns of settlement distribution and limitations of an individual's capacity in land exploitation, which tend to be functions of decision processes of local communities and historical accidents. The transportation network that subsists can hardly be described in economic terms, limited as it is to footpaths until recently.

One important obstacle to studies of this nature concerns the impermanence of crop zones beyond the backyard. Distance to farms cannot be measured in terms of transport costs since farmers travel mostly on foot. Productivity is essentially traditional, subsistence, and the orientation of economic activity towards marketing is not fully developed. Villages, however, have changes of land use beyond the built-up area. Each dwelling has a backyard and sometimes a foreyard where assorted vegetables and food crops are grown (Plate 3.3). Beyond the backyard there is the narrow green belt of economic trees, which may describe the outer margin of a settlement or may be partially cleared as the settlement expands (Siddle, 1969). Beyond this green belt, a plot of land under intense crop rotation merges with the outer territory of the settlement. Upland rice is cultivated at this outer margin where crop rotation is less intense and

fallow periods rather long.

A concentric pattern of land use zones emerges from this type of organisation but there are a host of variations. In newly founded farm villages the rice farm may be located immediately behind the built-up area, and its position advances farther away from this point as the settlement gets older. An analysis of land use zones by expenditure and income values of farm operation retains the step-like structure of changes from one land use zone to another (Haggett, 1965, 158); but the concentric pattern is disrupted. The backyard is the nearest cropped zone to the collecting centre of farm produce. It is more fertile than any other piece of land but productivity here is for domestic consumption. It is limited in size - usually under half an acre, and its economic rent cannot be easily determined. The green belt zone produces bulkier cash crops like kola nuts, bananas and oranges which are not a basic necessity for survival. Some of these trees are planted to mark specific locations of graves, some are the result of dumping rubbish at the fringe of the backyard. This zone has more cultural than agricultural significance.

The land beyond the green belt may have a crop combination of potatoes, cassava and groundnuts. In this shifting system there is usually an uncultivated zone between the general crop and rice zones, representing previous farmland now under fallow. Peas, groundnuts and potatoes

often reach local markets in small quantities as these are essential domestic food supplements. Soils in this general crop zone may be of medium fertility but production cannot be interpreted in terms of economic rent - the demand factor being modified by consumption needs of the labour element in the production unit. Upland and swamp rice farms can be most distant from the village but these provide the most important marketable commodity - rice. The zone of highest economic rent seems to be located at the rice farm zone which is most migratory.

An attempt has been made to illustrate the theoretical spatial structure of land use in shifting cultivation, using cash returns on farming. For this study the economic rent or returns is the difference between the mean price of farm produce per acre, and the incurred expenditure on farm operation. Expenditure on wages is not subtracted from the price of farm produce as family labour is non-remunerative. In Bombali, a farming family operating a seasonal acreage of 4·47 acres will end the season harvesting eight crops with production prices ranging from Le 7·54 for a guinea corn-with-millet farm to Le 28·82 for an acre of upland rice (Table 3.3). The assumption in this example is that crop zones merge with each other in an order like maize, groundnuts, potatoes, cassava, guinea corn with millet, mixed upland rice and swamp rice. If one computes the economic rent per acre of crop a step-like pattern of crop zones can be derived (Fig. 3.5). The area of highest

Table 3.3 Economic rent per acre of food crop, Bombali, 1969

Food crop	Man days (labour)	Price per acre of production (in Leones)	Production cost (in Leones)	Economic rent (in Leones)
Mixed upland rice	47.0	28.81	5.36	23.45
Groundnuts	23.0	17.94	4.58	13.36
Maize	13.5	9.79	1.47	8.32
Sweet potatoes	36.0	24.08	2.68	21.40
Cassava	30.5	20.16	4.63	15.53
Guinea corn & millet	12.0	7.54	2.71	4.83
Swamp rice	60.5	28.64	2.34	26.30

Source: Mitra, 1969.

Table 3.4 Economic rent on mean crop acreage, Bombali, 1969

Food crop	Acreage	Man days	Production price (in Leones)	Costs (in Leones)	Economic rent (in Leones)
Mixed upland rice	2.63	123.60	75.77	14.09	61.68
Groundnuts	0.14	3.22	2.51	0.64	1.87
Maize	0.13	1.76	1.27	0.19	1.08
Sweet potatoes	0.15	5.40	3.61	0.40	3.21
Cassava	0.21	6.41	4.23	0.97	3.26
Guinea corn/ millet	0.17	2.04	1.28	0.46	0.82
Swamp rice	1.04	62.92	29.78	2.43	27.35

Source: Mitra, 1969

Fig 3·5 THEORETICAL LAND USE ZONES

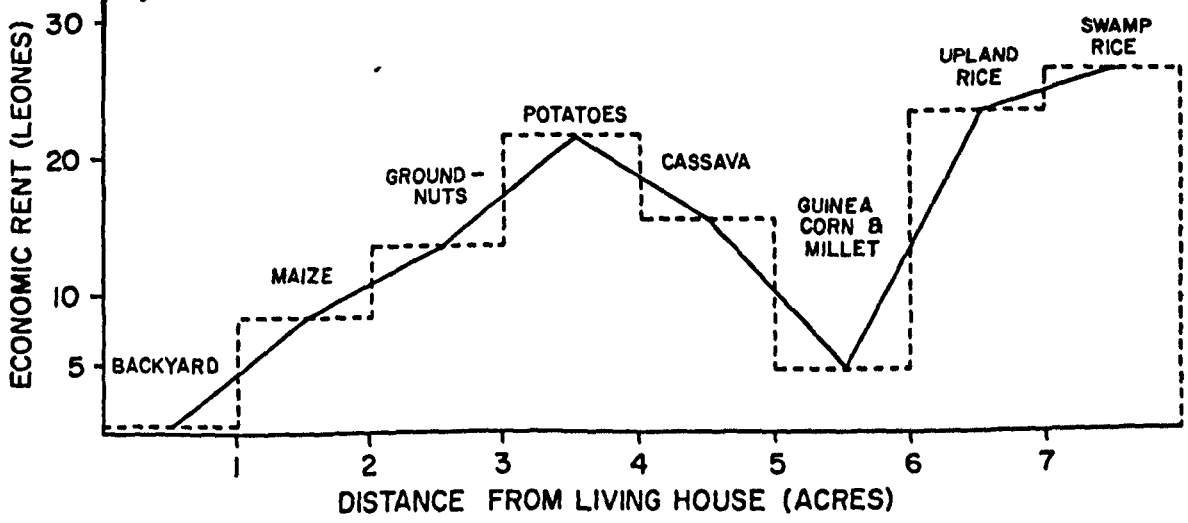
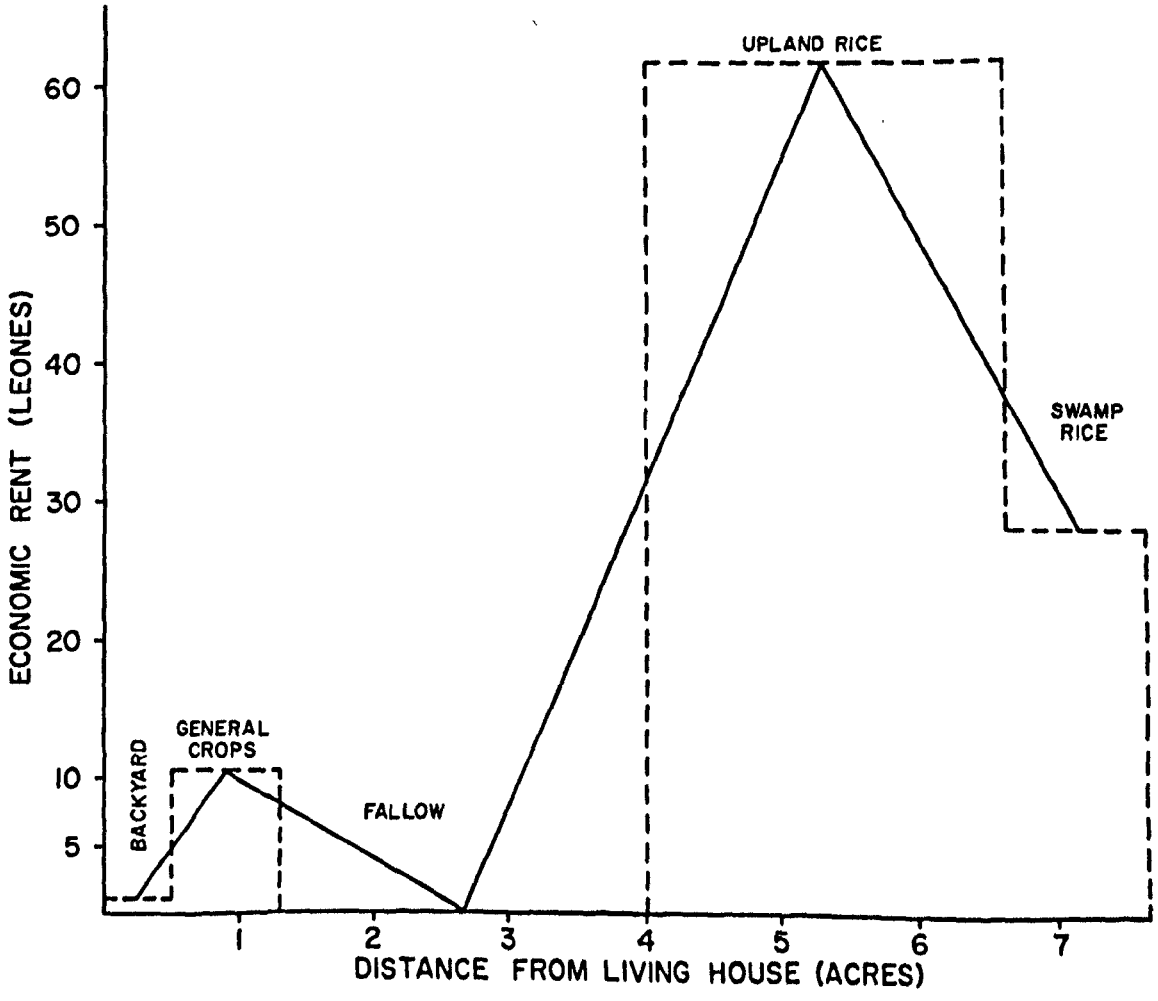
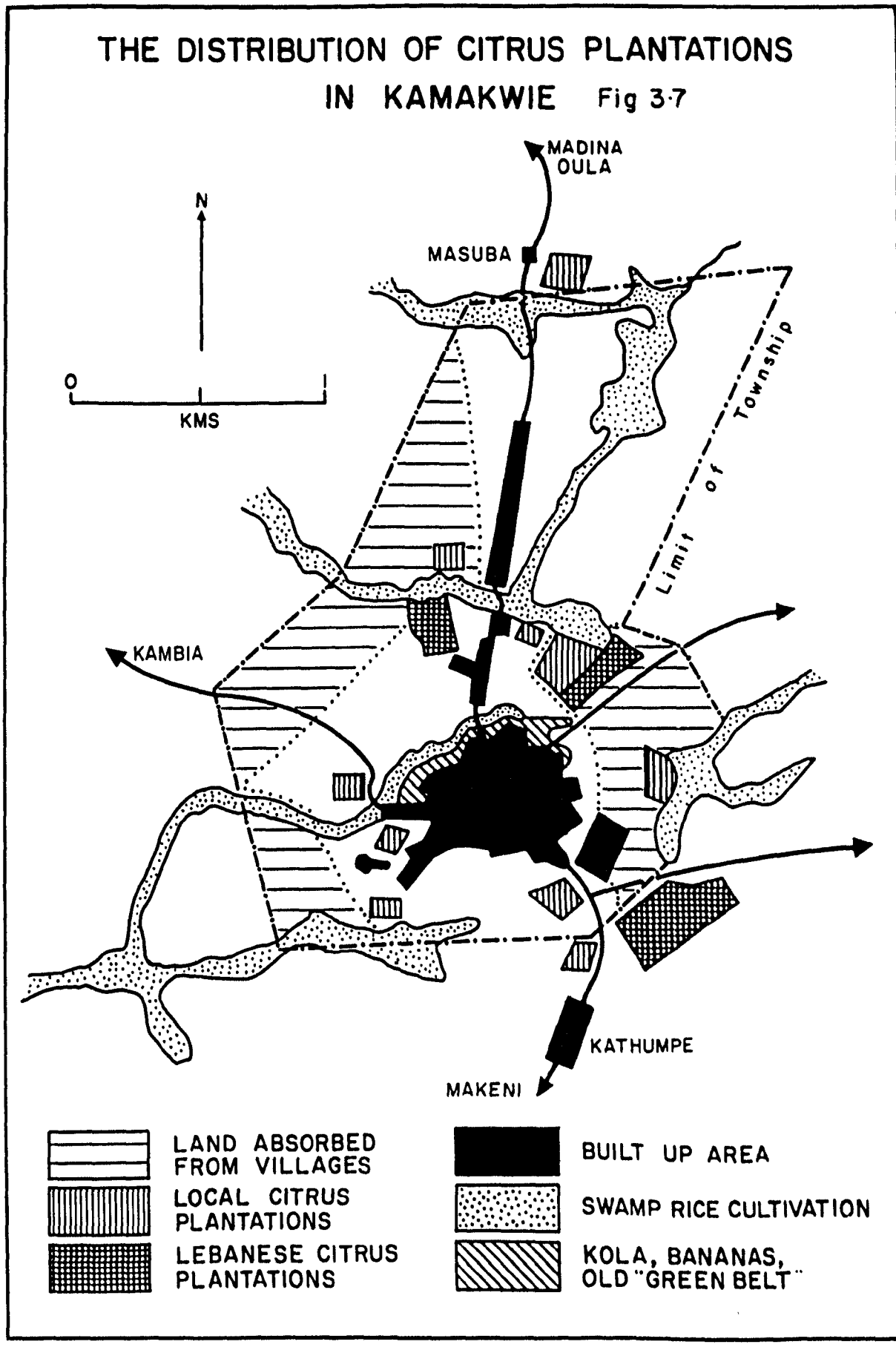


Fig 3·6 ACTUAL LAND USE ZONES



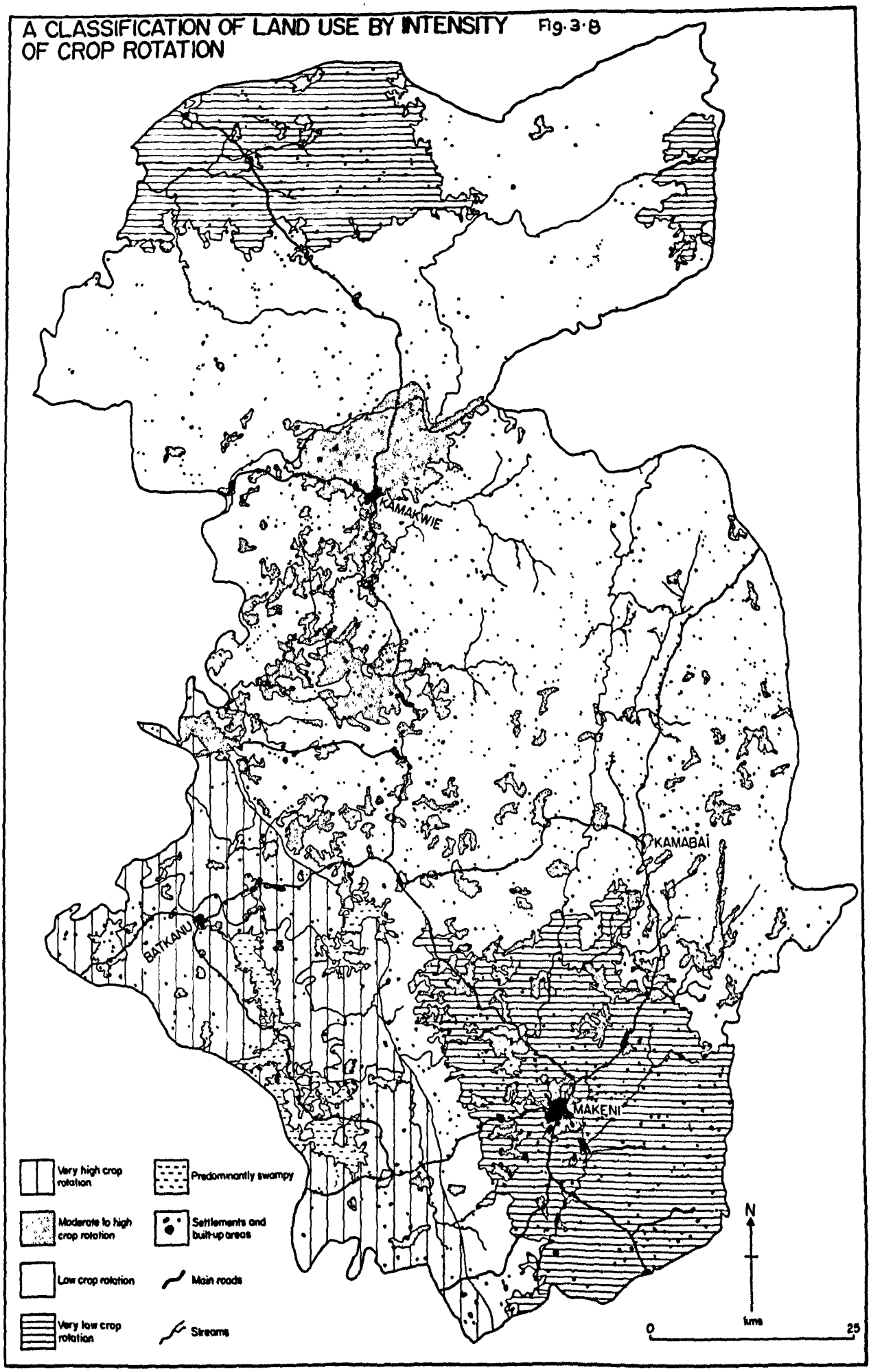

THE DISTRIBUTION OF CITRUS PLANTATIONS
IN KAMAKWIE Fig 3·7
MADINA
OULA
N
MASUBA
0
KMS
Limit of Township
KAMBIA
KATHUMPE
MAKENI
LAND ABSORBED FROM VILLAGES
LOCAL CITRUS PLANTATIONS
LEBANESE CITRUS PLANTATIONS
BUILT UP AREA
SWAMP RICE CULTIVATION
KOLA, BANANAS, OLD "GREEN BELT"

economic rent will be farthest away from the collecting centre, followed by medium distance crop zones of groundnuts potatoes and cassava.

In Table 3.4, actual mean acreages per crop are shown and economic rent values across the farmer's territory are graphically illustrated in Figure 3.6. There is an uneven distribution of acreage per crop zone. The area of highest economic rent is consequently not necessarily nearest to the collecting point of farm produce. There is a 'gap' in the graph representing either abandonned land or fallow. This pattern may further be complicated by seasonal transfers of land to other cultivators. In a larger settlement like Kamakwie, permanent crop zones tend to develop, baring greater concentricity than in less permanent settlements (Fig. 3.7). However future town planners have to contend with current limitations to urban expansion - a) territorial boundaries of elder villages surrounding the town, b) the location of tree crop plantations at sites with greater potential for urban expansion.

LAND USE PRACTICES AS A BASIS OF CLASSIFYING SHIFTING CULTIVATION

An attempt has been made to classify land use according to the intensity of rotational practice. In such a classification swampland cultivation and cropping near built-up areas are of highly intensive rotational practice, terrace farming is medium, while upland farming is low. No actual


A CLASSIFICATION OF LAND USE BY INTENSITY OF CROP ROTATION
Fig. 3·8
KAMAKWIE
KAMABAI
BATKANU
MAKENI
Very high crop rotation
Moderate to high crop rotation
Low crop rotation
Very low crop rotation
Predominantly swampy
Settlements and built-up areas
Main roads
Streams
N
0
25
kms

weighting is given to such a classification but the density of the agricultural population and size of settlements were considered in the determination of variations in rotational practices. One therefore describes regions of high crop rotation, medium to low, low and marginal levels (Fig. 3.8).

Areas of high crop rotation are of patchy distribution in the southern portion of the district and associated with shorter fallow periods of two to three years. Further north intense land use is observed along streams. Settlement is nucleated and denser distributions along valley bottoms tend to reduce fallow periods. Access tends to be a limitation to the growth of area under intense crop rotation. While the main communication lines link large towns they tend to avoid more marshy areas which are more easily subjected to intense cultivation. Moderate to low rotational practices are more preponderant in the central uplands. Here narrow valley swamps are under intense rotation, the terraces are moderately rotational while upland soil areas are under shifting cultivation.

Most farmland in the district is under low to marginal crop rotation (Table 3.5). With poor transport facilities, uncontrolled grazing, bush fires and squatting, the district farmlands are least organised. The north and south-east have the largest portions of remnant farm bush vegetation. Fallow periods however differ - to the north low population densities permit shifting cultivation and longer fallow

Table 3.5 Predominant farm practices on cultivable land

Farm practice	Approximate acreage	%
Intense crop rotation	278,252·8	16
Moderate crop rotation	208,684·8	12
Low crop rotation	929,708·8	53
Marginal crop rotation	330,425·6	19

periods of six to eight years; to the south-east, greater rainfall (> 100 inches) and more humid conditions sustain rapid vegetation regrowth and fallows are generally under five years. The main factors affecting intensities of crop rotation are summarised in Table 3.6.

Human factors in land use are not only related to population density. The appropriation of land for different purposes is a managerial function of the village head at the upper social level and that of the family or clan head at a lower level. The size and quality of farmland are not dependent upon an individual's ability to operate but upon the group leader's consideration and determination of the individual's and other people's land needs. While large areas may be susceptible to a certain farm practice, its actual areal extent will depend upon decisions taken at a higher level. In other words, pressures on land tend to be localised demographic and traditional administrative phenomena in the district. Oluwasanmi's observation of the situation in Nigeria is rather startling but similar to findings in Bombali:

Table 3.6 Factors affecting intensity of crop rotation

	Intensity of crop rotation			
	Intense	Moderate	Low	Very Low
Main types of produce	swamp rice, cassava sweet potatoes.	mixed upland rice, narrow valley swamp rice, cassava, maize, groundnuts, guinea corn, mil millet, yams.	mixed upland rice, narrow valley swamp rice, groundnuts, cassava, cattle	mixed upland rice, cassava, potatoes, guinea corn, millet, yams.
Fallow periods	1-2 years	3-5 years	6-8 years	6-8 years
Farm practices	traditional rice transplanting with increasing mechanisation.	traditional rice transplanting, upland farming, increasing rotation of crops near townships.	mainly shifting, uncontrolled cattle grazing; and frequent bush fires.	mainly shifting and compound farming in southwest.
Drainage	mainly depositional area, seasonal floods of 3-4 months.	slight leaching, moderate, fairly gentle slopes on terraces, occasional floods on streams.	heavy soil leaching, moderate to steeper conditions towards the eastern hills, soil erosion.	steeper slopes eastward, gulley erosion on margins of steep valleys.
Soils	valley bottom varieties and lithosols in upland area.	narrow valley bottom soils, terrace soils but more of upland varieties and lithosols.	mostly upland soils, to iron pan concretions and rock outcrops.	upland soils with heavy iron content, easily eroded with first brushing especially at steep slopes.
Vegetat-	swamp varieties & giant grass, lophira bush on higher land.	open bush to savanna grass, mainly derived savanna.	open grassland with isolated trees, developing lophira bush.	savanna in the north, derived forest and open woodland in the south.
Access	low/poor	moderate	low	low/poor
Settlement density	low	high	moderate	moderate/low

> "As a consequence of the tenure system, there exists an anomalous situation in which, in a country that has 50% of its cultivable land in uncultivated bush, certain sections of the community starve for lack of good agricultural land" (193).

The criticism of traditional methods of land distribution may be as difficult as that of shifting cultivation. For example in a situation where a farmer's seasonal need is 2½ acres of fresh farm bush, sixty farmers will need 150 acres at every growing season and within a period of eight years when the original farm is ready for recultivation, 1,200 acres of farmland will have been cleared. The application of improved farm practices is therefore localised and tends to develop around larger settlements where land distribution is fairly permanent.

LAND TENURE

The tenure system in Bombali has been studied at three administrative levels - the national, chiefdom and village levels. Provincial land is regarded as communal property with no individual rights of sale or transfer. The binding factor in such group ownership is the clan which is united by a common medium of expression or by a common lineage. Land is a destined property of the dead, its traditional undertakers in the world of the dead, the living its present caretakers, and the unborn its future caretakers. As a unit of production, land property held in trust belongs to members of a given lineage believed to be actively operative

on land matters, whether dead, living or unborn. The dead are appeased by sacrifice, the living hope to live long enough to see their children and grandchildren. Land is priceless and can only be transferred from one group of individuals to another with the understanding that the transaction is temporary - a communal allocation or a pledge.

At the national level only transfers of land sanctioned by the central government are legal. At the district level, the district commissioner represents the crown on all land matters. Government itself can appropriate land only for development purposes. It holds the right to sponsor land acquisition for mission schools and hospitals. It also provides lease conditions for aliens with commercial interests. Land transactions actually reaching this stage of legal documentation with cadastral definitions are very few and limited to commercial and missionary concessions.

The system of leasing in the district has its special peculiarity. Normally, there are four participant groups in a lease transaction - the district officer, the chief, tribal authority and a representative of the land-owning group. In leases involving a large area of land, claimants have no bargaining powers as the chief and tribal authority assume this function. The lease money is shared in three equal parts so that land owners receive only one third of it. A third is paid to the chiefdom treasury and the remainder, to the chief (Kamal, 1971). This system of distrib-

uting lease money stifles interest in land sales but tends to generate some awareness that land has a monetary value. Land ownership is thus a base for social prestige eventhough the owner has little bargaining power.

Foreigners, especially Lebanese, prefer small land transactions involving fewer participants. In Kamakwie, for example, a 40 acre plot can cost a shrewd Lebanese negotiator a lease fee of under £15 per annum. Such a transaction involves two interested persons - the Lebanese and landowner. The land is surveyed, the chief and one tribal authority sign or stamp their thumb prints on a plan that may be little understood and sent to the district office for formal approval. In such transactions the Lebanese negotiator offers undisclosed sums of money to all interested parties in the form of 'handshakes'. Transactions of this nature are, of course, short-lived and subject to disputes especially if there is a misunderstanding concerning the distribution of money among claimants in the land owning group.

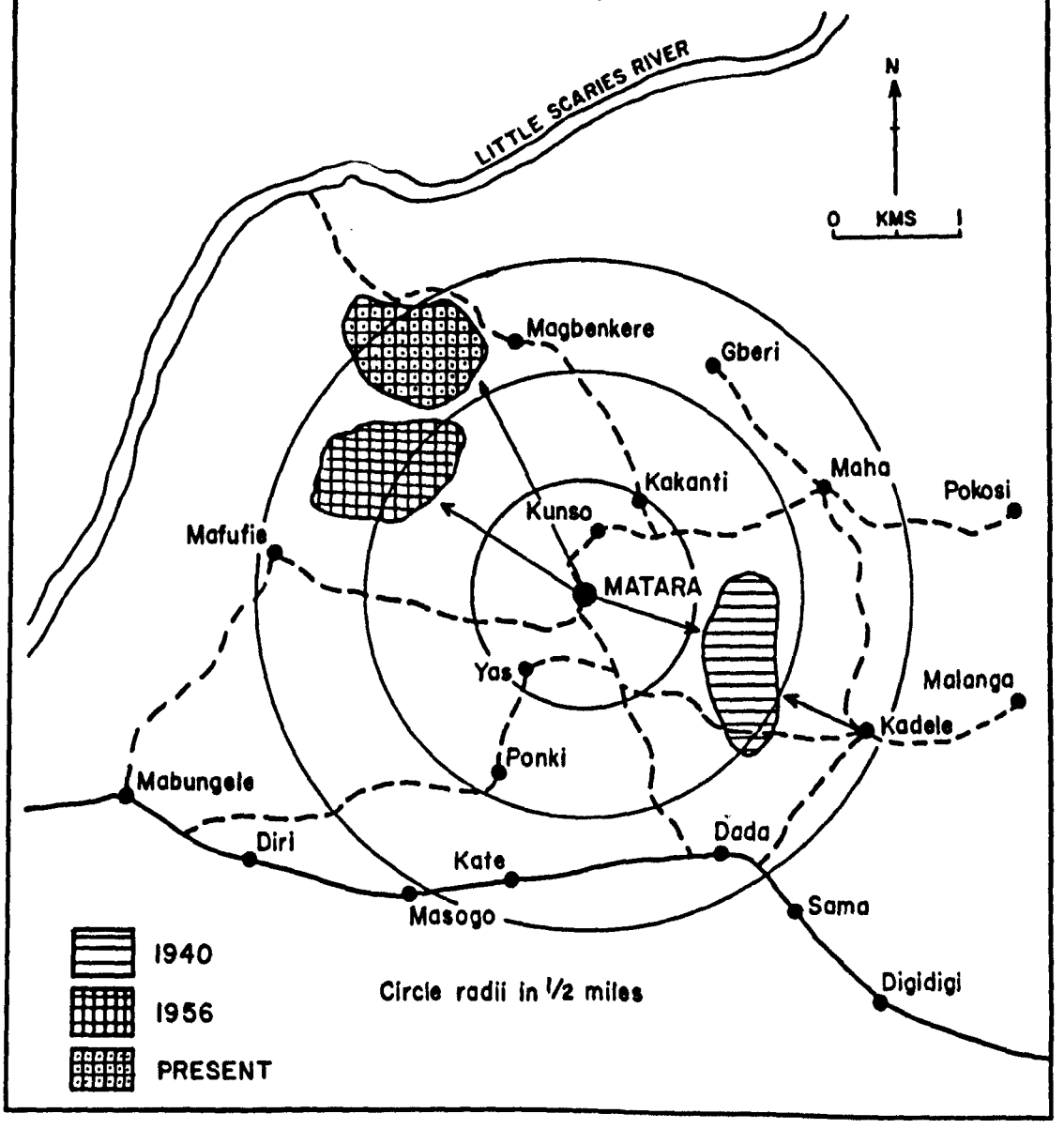
Most land transactions take place at the village level, and involve group bargaining. They are naturally undocumented and participants are expected to remember conclusions reached during negotiation. Trees, streams and roads are normal boundary posts; some of these may change course or disappear in time and actual delimitations of specific land boundaries are impossible. This is why the duration of land transfers is more dependent on tolerance and mutual understanding than on money. At individual family levels

Plate 3.4. A recently abandonned upland rice farm in Bombali. This picture was taken 14 miles north of Makeni. Forest regrowth is rapid, because this farm was abandonned for a single growing season but here female farmers are instituting a second slash and burn process to cultivate groundnuts.

land transfers may be temporary or permanent. Temporary holding rights are often given to stranger farmers who are expected to donate part of their harvest to land lords as a token of appreciation and as an acknowledgement of the stranger's position as a temporary land occupant. Pledging is common, but this, as with other local transfers involves very small sums of money meant to tide the pledger over a period of hardship. The new land owner assumes absolute rights over pledged land until the debt is paid.

Women form the bulk of temporary landowners in the district - as predominantly general crop farmers. As male farmers require fresh pieces of farm bush, the women are permitted to crop abandoned rice farms which are easier to brush (Plate 3.4). The occupance is mainly seasonal and this introduces a crude rotation system with little control over types of crops grown. Forced land transfers are the opposite of female land transactions. Here the conflict concerns land needs of a founder village over territories of 'daughter' villages. Settlers in a founder village hold land rights over the territory of a farm village just as those of the latter can, by lineage, enjoy freehold rights in the territory of the former. Usually, however, it is farmers from the older village that migrate to smaller farm villages because this is where access to fresh farm bush is less problematic. An aggressive founder village may virtually be at war with surrounding younger farm villages wnen there is a shortage of farm bush.

Fig 3·9 Directions of Matara village pressures for land



Matara is one of the oldest founder villages in Sella Limba chiefdom, sharing land rights with 12 other younger settlements (Fig. 3.9). In 1940, villagers from this settlement clashed over land rights with villagers of Kadele, 1½ miles from Matara. In 1956, they quarelled over the use of narrow valley swamps worked by farmers at Mafufi, a village 1¾ miles from Matara. Their latest quarrel is with villagers of Magbenkere, who for the past six years have been called to testify on the land situation at court sittings. In a spatial context, the direction of Matara agression has been fairly logical though not necessarily legal. Within a radius of half a mile there are two villages flanking Matara in a south-west - north-easterly direction, limiting any moves at expansion (Fig. 3.9). Within a radius of one mile there are five villages and at 1½ miles no less than 12 settlements surround Matara. The only logical direction in search of fresh farmland is either to the south-east, where Matara has clashed with Kadele, or to the north-west where there have been quarrels with Mafufi and Magbenkere farmers.

Aggressive tendencies are rare in land transactions involving in-laws, but there is a recognised stratification in rights of tenure. Claimants to land on paternal grounds hold higher order rights than maternal claims. At the bottom are the lower order rights of freehold for stranger farmers and squatters. The main claims to land rights are sex-differential. For example, a stranger marrying a village girl enjoys temporary rights of tenure through inheritance rights of the wife. Such rights are only viable provided

that there is no divorce, death of the wife and that there are offspring.

At the interchiefdom level, land transactions depend largely on tolerance on the part of the host chiefdom. This type of land transfer may be temporary, but permanent settlement may lead to an ultimate acquisition of freehold rights. Migrant farmers deal directly with village heads rather than the chief. Chiefdom disputes are thus reduced as the central authority is usually not aware of stranger land-occupance - a more common practice in the swamplands where settlement is sparse.

OBSERVED CHANGES FROM TRADITIONAL CONCEPTS OF LAND TENURE

Land tenure systems tend to vary with particular locations and circumstances. These variations are extremely difficult to unravel especially as they are an outcome of the physical environment and a complexity of human relationships. The rate at which these systems evolve will, to a large extent depend on the development of incentives for gainful productivity, a realisation that land as a unit of production can be valued in economic and monetary terms and an awareness that a permanent allocation of land to individual families may create a greater concern for land management. A generalisation of this nature has an assumption that condemns communality and shifting cultivation. A study of local attitudes to land transfers largely contradicts this generalisation but observed changes in concepts were suggestive of a fairly dynamic peasant society that is

wedged in a static system.

In this study of local attitudes, 923 family heads were interviewed from 24 settlements. A questionnaire was prepared which required a simple answer of 'yes' or 'no' to the following six questions:

"1. If government devises to buy your land and settle you elsewhere will you agree?
2. If someone offers you a good price for your land will you sell it?
3. If someone from Freetown (Western Area) wishes to build a house in your town/village will you sell him some of your land?
4. If someone from Southern Sierra Leone wishes to build a house in your town/village will you sell him some of your land?
5. Are you willing to sell your land to government?
6. Are you willing to sell your land to a co-operative society? "

The questions were basically very similar and this was deliberately done to test the relative consistency of attitudes towards parting with land. Questions 3 and 4 were meant to assess local preferences of possible neighbours - the man from the former colony area as opposed to the provincial from the south. The first and last questions were a test of local opinions on the possibility of settlement schemes and large-scale farming.

Table 3.7. Data analysis of Village Attitudes Towards Land Sales.

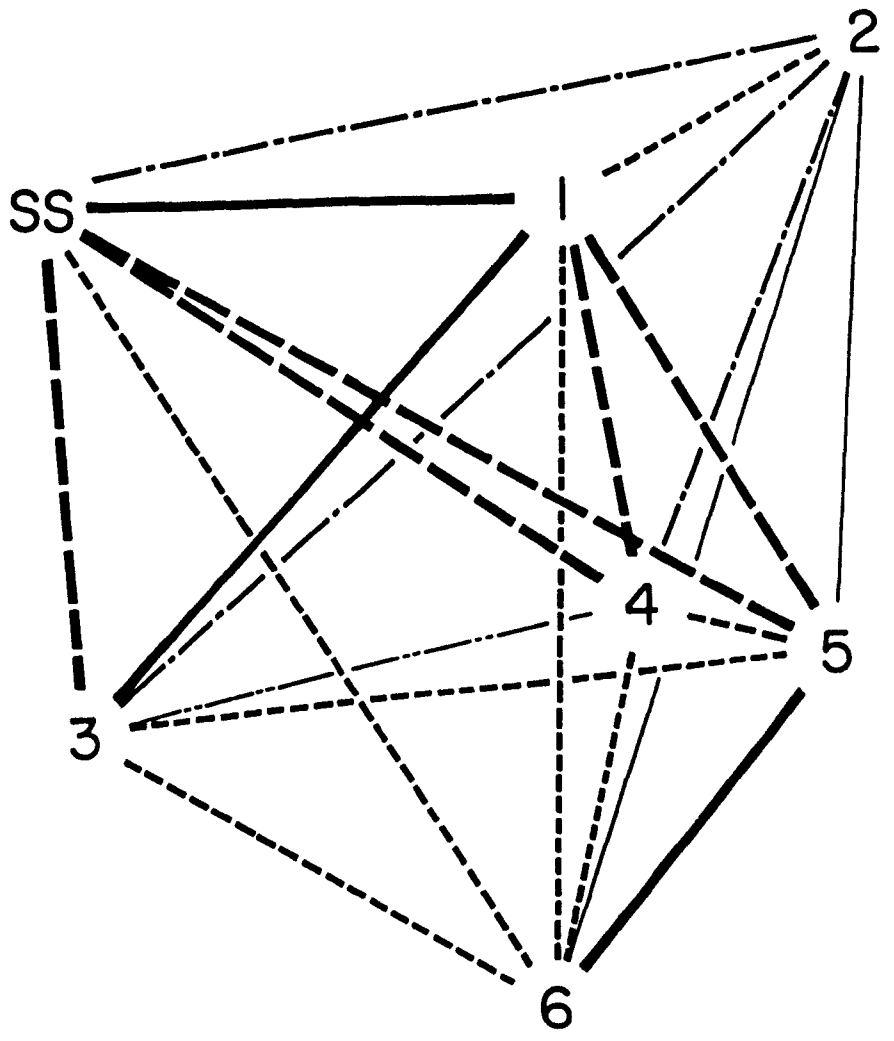
	Bendembu	Marampa	Mafaray	Mafaray	Kagbungbe	Kapete	Kamaranka	Kalangba	Rogbin	Kakela	Mabunyele	Ramurthe	Kamakwie	Kamafufay	Kamagbonse	Kamabai	Samaya	Kamalo	Binkolo	Mabonkwai	Makeni	Kamasorun-kay	Kamab-boum	Falaba	
923	132.00	14.00	13.00	7.00	9.00	11.00	54.00	72.00	69.00	11.00	5.00	33.00	75.00	8.00	4.00	71.00	25.00	120.00	82.00	29.00	69.00	4.00	4.00	2.00	No.of people interviewed.
	14.3	1.5	1.4	.8	1.00	1.2	5.9	7.8	7.5	1.2	0.5	3.6	8.1	0.9	0.4	7.7	2.57	13.00	8.9	3.1	7.5	0.4	0.4	0.2	%.
236	18.00	8.00	4.00	1.00	6.00	1.00	9.00	11.00	47.00	1.00	1.00	7.00	20.00	4.00	0.00	19.00	7.00	23.00	30.00	7.00	9.00	3.00	0.00	0.00	'Yes' answers on Q.1.
687	114.00	6.00	9.00	6.00	3.00	10.00	45.00	61.00	22.00	10.00	4.00	26.00	55.00	4.00	4.00	52.00	18.00	97.00	52.00	22.00	63.00	1.00	4.00	2.00	'Nos'.
25.57	13.6	57.1	30.8	14.3	66.7	9.1	16.7	15.3	68.1	9.1	20.00	21.2	26.7	50.00	0.00	26.8	28.00	19.2	46.2	24.1	13.00	75.00	0.00	0.00	% 'Yes'.
76	8.00	6.00	0.00	0.00	3.00	0.00	2.00	0.00	13.00	0.00	0.00	2.00	4.00	0.00	0.00	0.00	5.00	7.00	18.00	1.00	4.00	4.00	0.00	0.00	'Yes' answers on Q.2.
847	124.00	8.00	13.00	7.00	6.00	11.00	52.00	72.00	56.00	11.00	5.00	31.00	71.00	8.00	4.00	71.00	20.00	113.00	64.00	28.00	66.00	0.00	4.00	2.00	'Nos'.
8.2	6.1	42.9	0.00	0.00	33.3	0.00	3.7	0.00	18.8	0.00	0.00	6.1	5.3	0.00	0.00	0.00	20.00	5.8	22.00	3.4	4.3	100.00	0.00	0.00	% 'Yes'.
279	28.00	1.00	1.00	2.00	2.00	0.00	19.00	15.00	46.00	1.00	2.00	17.00	8.00	6.00	1.00	12.00	11.00	58.00	28.00	7.00	12.00	2.00	0.00	0.00	'Yes' answers on Q.3.
644	105.00	13.00	12.00	5.00	7.00	11.00	35.00	57.00	23.00	10.00	3.00	16.00	67.00	2.00	3.00	59.00	14.00	62.00	54.00	22.00	57.00	2.00	4.00	2.00	'Nos'.
30.23	21.2	7.1	7.7	28.6	22.2	0.00	35.2	20.8	66.7	9.1	40.0	51.5	10.7	75.00	25.00	16.9	44.00	48.3	34.1	24.1	17.4	50.00	0.00	0.00	% 'Yes'.
233	31	0.00	0.00	0.00	0.00	0.00	13.00	14.00	44.00	1.00	1.00	17.00	8.00	0.00	0.00	10.00	11.00	48.00	18.00	6.00	11.00	2.00	0.00	0.00	'Yes' answers on Q.4.
688	101.00	14.00	13.00	7.00	9.00	11.00	41.00	58.00	25.00	10.00	4.00	16.00	67.00	8.00	4.00	61.00	14.00	72.00	64.00	23.00	58.00	2.00	4.00	2.00	'Nos'.
25.46	23.5	0.00	0.00	0.00	0.00	0.00	24.1	19.4	63.8	9.1	20.00	51.5	10.7	0.00	0.00	14.1	44.00	40.00	22.00	20.7	15.9	50.00	0.00	0.00	% 'Yes'
67	12.00	0.00	2.00	0.00	1.00	1.00	3.00	6.00	33.00	0.00	0.00	0.00	2.00	0.00	0.00	8.00	0.00	8.00	18.00	1.00	6.00	2.00	0.00	0.00	'Yes' answers on Q.5.
856	120.00	14.00	11.00	7.00	8.00	10.00	51.00	66.00	36.00	11.00	5.00	33.00	73.00	8.00	4.00	63.00	25.00	112.00	64.00	28.00	63.00	2.00	4.00	2.00	'Nos'.
7.26	9.1	0.00	15.4	0.00	11.1	9.1	5.6	8.3	47.8	0.00	0.00	0.00	2.7	0.00	0.00	11.3	0.00	6.9	22.00	3.4	8.7	50.00	0.00	0.00	% 'Yes'.
70	8.00	0.00	3.00	0.00	2.00	1.00	5.00	5.00	6.00	0.00	2.00	0.00	2.00	1.00	0.00	5.00	0.00	10.00	13.00	0.00	5.00	2.00	0.00	0.00	'Yes' answers on Q.6.
853	124.00	14.00	10.00	7.00	7.00	10.00	49.00	67.00	63.0	11.00	3.00	33.00	73.00	7.00	4.00	66.00	25.00	110.00	69.00	29.00	64.00	2.00	4.00	2.00	'Nos'.
7.58	6.1	0.00	23.1	0.00	22.2	9.1	9.3	6.9	8.7	0.00	40.00	0.00	2.7	12.5	0.00	7.00	0.00	8.3	15.9	0.00	7.2	90.00	0.00	0.00	%'Yes'.
	1.00	13.00	14.00	19.00	17.00	15.5	9.00	5.00	7.5	15.5	20.00	10.00	4.00	18.00	22.00	6.00	12.00	2.00	3.00	11.00	7.5	22.00	22.00	24.00	Rank of sample size.
	6.00	10.00	15.5	19.5	14.00	19.5	8.5	7.00	1.00	19.5	19.5	12.00	4.00	15.5	23.00	5.00	12.00	3.00	2.00	12.00	8.5	17.00	23.00	23.00	Rank of 'Yes' in Q.1.
	3.00	5.00	19.00	19.00	9.5	19.00	11.5	19.00	2.00	19.00	19.00	11.5	7.5	19.00	19.00	19.00	6.00	4.00	1.00	13.00	9.5	7.5	19.00	19.00	Rank of 'Yes' in Q.2.
	3.5	19.5	19.5	15.5	15.5	23.00	5.00	7.00	2.00	19.5	15.5	6.00	11.00	13.00	19.5	8.5	10.00	1.00	3.5	12.00	8.5	15.5	23.00	23.00	Rank of 'Yes' in Q.3.
	3.00	20.00	20.00	20.00	20.00	20.00	7.00	6.00	2.00	14.5	14.5	5.00	11.00	20.00	20.00	10.00	8.5	1.00	4.00	12.00	8.5	13.00	20.00	20.00	Rank of 'Yes' in Q.4.
	3.00	19.5	10.00	19.5	13.00	13.00	8.00	6.5	1.00	19.5	19.5	19.5	10.00	19.5	19.5	4.5	19.5	4.5	2.00	13.00	6.5	10.00	19.5	19.5	Rank of 'Yes' in Q.5.
	3.00	19.00	9.00	19.00	11.00	13.5	6.5	6.5	4.00	19.00	11.00	19.00	11.00	15.5	19.00	6.5	19.00	2.00	1.00	19.00	6.5	11.00	19.00	19.00	Rank of 'Yes' in Q.6.
	22.5	106.00	107.00	131.5	100.00	123.5	55.5	57.00	19.5	126.5	119.00	83.00	58.5	118.5	142.00	59.5	87.00	17.5	16.5	92.00	95.5	96.00	145.9	147.5	Total or Cumulative Rank.
	3.21	15.14	15.29	18.79	14.29	17.64	7.93	8.14	2.79	18.7	17.00	11.86	8.36	16.93	20.29	8.5	12.43	2.5	2.36	13.14	7.93	13.71	10.79	21.07	Mean Rank.

Of the 923 people interviewed, 236 or 25·57% were willing to sell land to government and be settled elsewhere. Family heads interested in selling land to a buyer from Freetown accounted for 30·23% of those interviewed, while 25·46% would sell some of their land to a southerner. These three questions had higher positive answers than the second question (8·2%), the fifth (7·58%) and the sixth (7·58%). There tended to be a greater preference for Freetown buyers than for southern buyers (Table 3.7). Questions on the sale of land for a good price, to government and a co-operative society, all involved a complete transfer of freehold rights. The consistency of low positive answers is remarkable compared with higher positive answers to questions involving a partial loss of rights. At the individual town or village level, there is a similar consistency of answers. Most of the smallest villages - Falaba, Kamakubuna, Kamagbonso - express absolute unwillingness to sell land or be settled elsewhere. Large towns like Makeni and Bendembu tend to have a medium positive response to land sales.

Observed positive answers to these questions represent deviations from traditional ideas about land transfers. These deviations are relatively low, but as an index of change it is reasonable to assume that some landowners are willing to sell their land. Such an assumption runs counter to the land laws which prohibit direct sales of land. This assumption is therefore subjected to some statistical tests to find out whether it is significantly related to the size

RANK CORRELATION OF SAMPLE SIZE AND POSITIVE ANSWERS TO QUESTIONS 1-6

Fig 3·10



SS Sample Size

·85–·94

·75–·84

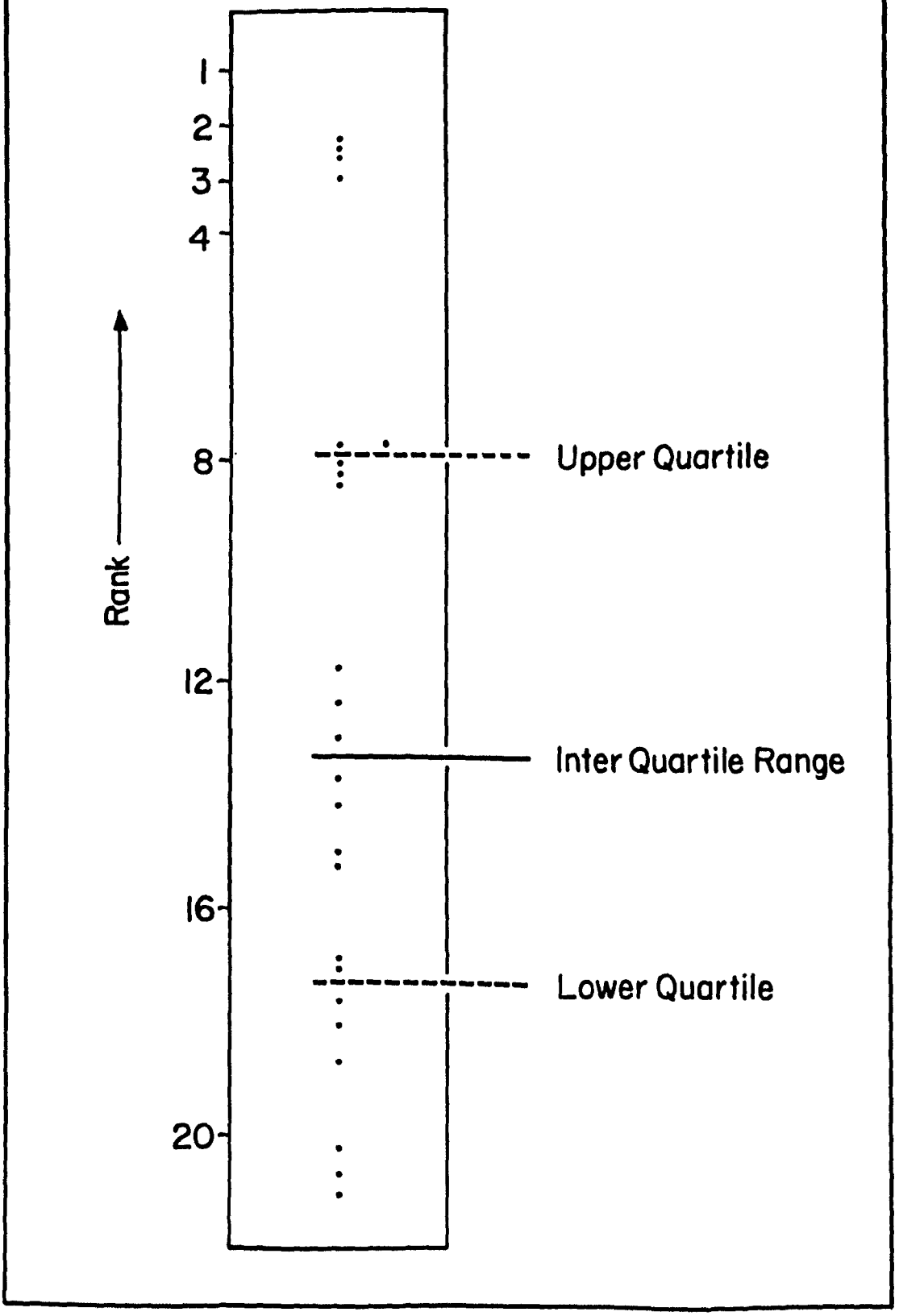
·65–·74

·55–·64

·45–·54

<·45

QUARTILE DISTRIBUTION OF MEAN RANK BY VILLAGE
Fig 3·11



of the sample and hence, that of settlement. A rank correlation matrix of actual sample size and positive answers to the six questions shows relatively high correlations that are significant at a 95% level of confidence (Table 3.8). The lowest correlation of ·27 is between the third and fourth questions, reflecting the competitive nature of preferences involved. The highest correlations(·85-·94) are between the size of samples and the first question, the third and first, and fifth and sixth. Most of the other correlations with sample size range from ·55 to ·84 (Fig. 3.10).

Since the rate of change from traditional unwillingness to sell land varies with locality, an attempt has been made at grouping positive individual settlement responses and relating them to observed land use problems in these localities. Individual village values are ranked and the ranks summed to produce cumulative ranks per settlement (Table 3.7). Mean village ranks are obtained from these sums and a quartile distribution was calculated (Fig. 3.11) from which a classification of settlements was obtained (Table 3.9).

Most of the larger villages and towns are within the upper quartile and upper sector of the interquartile range, Makeni, Kamakwie, Kamabai, Bendembu, Kalangba and Samaya. These are chiefdom towns, areas of relatively high economic activity and dense farm populations. Crop rotation

Table 3.8 Rank correlation matrix of positive answers and sample size

	Sample size	Question 1	Question 2	Question 3	Question 4	Question 5
Question 1	.927					
Question 2	.605	.716				
Question 3	.829	.868	.636			
Question 4	.821	.809	.643	.27		
Question 5	.762	.805	.529	.707	.701	
Question 6	.704	.75	.498	.717	.689	.916

Table 3.9 A quartile calculation of changes in attitudes on land Sales, 1971

Settlement	Mean cumulative rank	Size and type of settlement	Observed land problems
Kamalo	2.5	small chiefdom town.	cattle, tribal conflicts.
Binkolo	2.63	small chiefdom town.	cattle, difficult terrain.
Rogbin	2.79	large village.	cattle, population pressure.
Bendembu	3.21	small chiefdom town.	cattle, population pressure.
Makeni	7.93	very large chiefdom town.	population pressure.
Kamaranka	7.93 upper quartile	small chiefdom town.	cattle
Kalangba	8.14	small chiefdom town.	cattle
Kamakwie	8.36	large chiefdom town.	pop. pressure.
Kamabai	8.5	small chiefdom town.	cattle, difficult terrain.
Romurthe	11.86	medium village.	cattle
Samaya	12.43	large village	cattle
Mabonkani	13.14 inter quartile	medium village	pop. pressure, terrain
Kamasaramankay	13.71 range	medium village	cattle, terrain
Kagbumgbo	14.29	small farm village.	cattle, terrain
Mafaray	15.29	small farm village.	cattle, terrain
Marampa	15.4	very small farm village	cattle, terrain
Kamafufay	16.93	medium village	pop. pressure.
Mabunyele	17 lower	medium village	pop. pressure.
Kapete	17.64 quartile	medium village	cattle, terrain
Kakola	18.07	small farm village.	cattle, tradition
Maforay	18.79	v.small farm village.	cattle, tradition
Kamagbonso	20.29	v.small farm village.	cattle, tradition
Kamakubuna	20.79	v.small farm village.	cattle, terrain, tradition.
Falaba	21.07	v.small farm village.	cattle, terrain, tradition.

practices are more intense in such locations. The connectivity of these centres to main transportation routes makes them attractive to in-migrants and there is a general tendency for landowners to part with land. Settlements in the lower sector of the interquartile range are medium to large villages at hinterlands of larger townships. These settlements tend to have greatest level of change, situated as they are at locations where shifting cultivation and uncontrolled cattle grazing encourage farmers to move into chiefdom towns and abandon farms. Rogbin is a special land problem area where pressure on land is caused by high rural densities of population and herding communities.

The farmer's attachment to rapidy degrading land is less rigid and people tend to be liberal about the transfer of freehold rights. The lower quartile contains all the small farm villages, most of which are accessible by footpaths. Tradition's strongest foothold is in these isolated communities of peasant farmers who tend to be satisfied with their lot. The study of village responses to land matters illustrates the localised nature of human change. It also proves that rural society in Bombali is not static but at various levels of development. As population densities increase, changes in the application of land laws are voluntarily initiated and these generate alterations in traditional systems of land use. Provincial land laws are not flexible enough to accomodate these variations - this, perhaps is the most important restraint on the introduction of more modern systems of land use.

LAND TENURE AS AN OBSTACLE TO DEVELOPMENT IN BOMBALI

A primary function of provincial land laws concerns the protection of freehold rights of illiterate peasants, farmers whose main asset is farmland. At a national level differences in land laws between the Western Area and Provinces tend to be permanent dividers of Sierra Leone into "Colony" and "Protectorate". Such a view has political overtones but there is little demand for provincial land by Western Area people who are not farmers. The modification of laws to a level of individual freehold as in the Western Area will likely result in massive land sales, a short term growth of newly rich ethnic group leaders, a long term introduction of absentee landlords and a mass of landless farmers. Current land laws protect illiterate landowners from educated members of their groups. Apparently these laws do not prevent any Sierra Leonean from settling or farming where he likes. The deterrent to such a migratory practice stems from isolation from more developed areas, language barriers and the inability of the migrant farmer and land owner to resolve cultural differences.

Provincial land laws have thus been so unchallenged that planners for rural development have given little consideration to their impact on policy implementation. For example, Childs' district plans for 1949 suggested the development of local agricultural extension work, settlement schemes and the introduction of measures to increase the

numbers of livestock (1949, 10). After 22 years of careful planning the landless cattle herder has not come to terms with the traditional farmer. Settlement schemes are more likely to be successful if both herdsmen and peasant cultivators are encouraged to practice mixed farming. Intermarriages have taken place between the Fullah and native, to an extent that sub-ethnic groups have evolved. An introduction of mixed farming within such groups will most likely result in a simplification of tenure practices, definitions of land property boundaries and more controlled cattle grazing.

The tenure system in Bombali has three main limitations to rural development: a) the system limits acreage on family farms and such a limitation is closely related to the communal structure of society and its decision processes, b) it is a constraint to the development of individual incentives for increased productivity, c) it has little control over squatting and grazing. Unless cattle herders and squatters are prosecuted the law does not provide immediate protection over land use rights. Neither does it provide suitable conditions for large-scale farming. Any modifications of these laws depends upon some popular awareness that the system is outdated. New regulations must be provided to neutralise the pervading influence of the Fullah herdsman over the peasant. At the same time it may be necessary to introduce land taxation. Such a measure will likely generate some sense of responsibility to protect what one owns. This may then create an awareness that land becomes

a potential natural resource only when properly managed to maximise productivity.

Hussain has proposed the institution of local and departmental agency schemes of agricultural development, to which will be subjected all land rights:

> "The tribal authorities must be charged with both administrative and legislative measures with the task of formulating and implementing agricultural development plans in their chiefdoms. These plans should cover all aspects of land use - food crops, economic trees, forests, cattle grazing, water control, reclamation, soil conservation, etc. The exercise of land rights, no matter what category and in what form, should be subordinated to the purposes of such plans"(1964, 20).

A local authority with a responsibility of this magnitude must be able to define its objectives in development, and those in Bombali have hardly reached this level of sophistication. Local participation in development planning is of vital importance but the masses must be taught to define their needs and how to achieve them.

The impact of the tenure system on farm size remains an open question. While some researchers defend the economic viability of small peasant farms (Farmer, 1960; Oluwasanmi, 1966; Igbozurike, 1970)it is logical to suggest that increased peasant productivity may involve larger farm sizes and improved farm practices. The main advantage of peasant

land tenure that has been noticed concerns its permissive nature when faced with pressure:

> "So flexible and adaptable are the provisions of traditional tenure that it has accomodated the cultivation of such perennial crops as cocoa, oil palm and rubber without doing violence to its essential features" (Oluwasanmi, 1966, 46).

This comment is an apparent simplification of a more complex evolution. Plantations are colonial innovations which tended to be forced on the system. The result was a development of large plantations of educated indigenous elites and smaller ones of relatively advanced illiterate farmers. The local distrust of the latter in land transactions with educated elements in their group has not been studied in depth in Bombali or Sierra Leone. Until land holding masses are educated, it will be difficult to justify the need for flexibility of peasant land tenure. In Bombali this flexibility has tended to emerge from uncontrolled forces of population mobility and concentration, hitherto described as tolerance on the part of the land owners.

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CHAPTER IV

CHIEFDOMS AND CHIEFDOM BOUNDARIES

INTRODUCTION

This study of local administrative boundaries and chiefdoms involves a search for the nature and basis of chiefdom boundary delimitation, best-fit geometric figures in chiefdoms as administrative units, the relationship of physiography and population distribution with shapes of chiefdoms, and the deviations of shapes from a theoretical basis of local administrative unit forms in a multi-tribal district (Note 4.1). To some extent, the structures of local administration pre-date colonial rule, and changes in these structures may only be necessary if administration and development are not efficiently operative. This study is therefore limited to an assessment of the varying departures of chiefdoms from ideal situations for human organisation, the impact of chiefdom boundaries on the people they divide, and an explanation of major obstacles to possible boundary changes.

THE BASIS AND NATURE OF CHIEFDOMS

The main administrative objective in the colonial designation of local administrative units in Provincial Sierra Leone was the preservation of ethnic group development through which effective administration was achieved. This objective had two evolutionary phases - one in which local boundaries enclosed small tribal chiefdoms; and a second

involving the subsequent amalgamation of chiefdoms with identical tribes. The process of local boundary formation has actually never gone beyond the stage of delimitation. The pacification of warlike tribes had been achieved long before restructuring boundaries on a more complex functional basis.

The institution of local boundaries was effected with little knowledge about the nature of tribal population distribution. Early administrators seemed to have depended upon the physiographic characteristics of the district for the delimitation of chiefdoms. For example, the use of rivers and streams as boundaries can hardly be justified considering the fact that the drainage system in the district has had little control over the pattern of tribal settlement. The chiefdoms were, however, multi-functional and under a central agency, the district office. The chiefdom was responsible for its internal administration and development. The building of roads and native administration buildings has always been carried out by the chiefdom authority. Mission establishments like schools and health centres have often depended on local efforts.

The importance of local administrative boundaries has however been grossly underrated, just as the attitudes of local people enclosed within such divisions have had little attention in development planning. As Prescott observes:

> "...it seems likely that people are more aware of the influence on their lives of federal and internal

boundaries than of international boundaries." (1968, 153).

Such an awareness may be more observable where local boundaries cut across densely populated administrative units, fertile agricultural lands, or where a boundary lies within a zone of tension between two ethnic groups.

Where a government institutes a national economic development plan affecting the smallest administrative units of a country, local boundaries should have a functional viability that transcends tribal isolation. In most development plans of developing countries, the district is often regarded as an ideal development region. At the district level government civil service agencies supplement district council efforts at chiefdom development. Local feelings about administration and development are presented at this level since local chiefdom representatives are permitted to discuss their problems at district council meetings, the success of which depends to some extent on the educational standards of chiefdom councillors and their ability to discern a chiefdom's development priorities. The only official entrusted to resolve chiefdom problems is the district officer who is normally so overworked that he is unable to sense local attitudes and aspirations.

A basic assumption in this study is that the organisation of administrative units by tribal components greatly impedes social, economic and political development. What

can be more unfortunate is the situation where the district officer is unaware of real obstacles; for as early as 1949 a Colonial Office conference on African Administration observed this insufficient recognition of the real problem underlying agricultural development; which is not one of agricultural development but is how to overcome social, economic and political obstacles that bar the way to agricultural development (African, 1949, 37). One consolation is that these obstacles stem from tribalism and clanhood which are of national and local significance. Another consolation is that districts are not necessarily the ideal definition of a development region. As Weitz observes, an agricultural development region can be given a geographic definition and a demographic definition; but these are both unsatisfactory:

> "the most appropriate definition is functional; it states that the development region covers the area in which the effects of a certain development process are felt and within which certain goals can best be achieved and their implementation best planned." (Weitz, 1963, 105).

The functional definition explained by Weitz has some element of uncertainty concerning the goals in development plans, but this is broadly explained by Malgavkar and Ghiara who, in their study of development in developing countries, conclude that the boundaries of a development region are a function of the nature of activites we have in

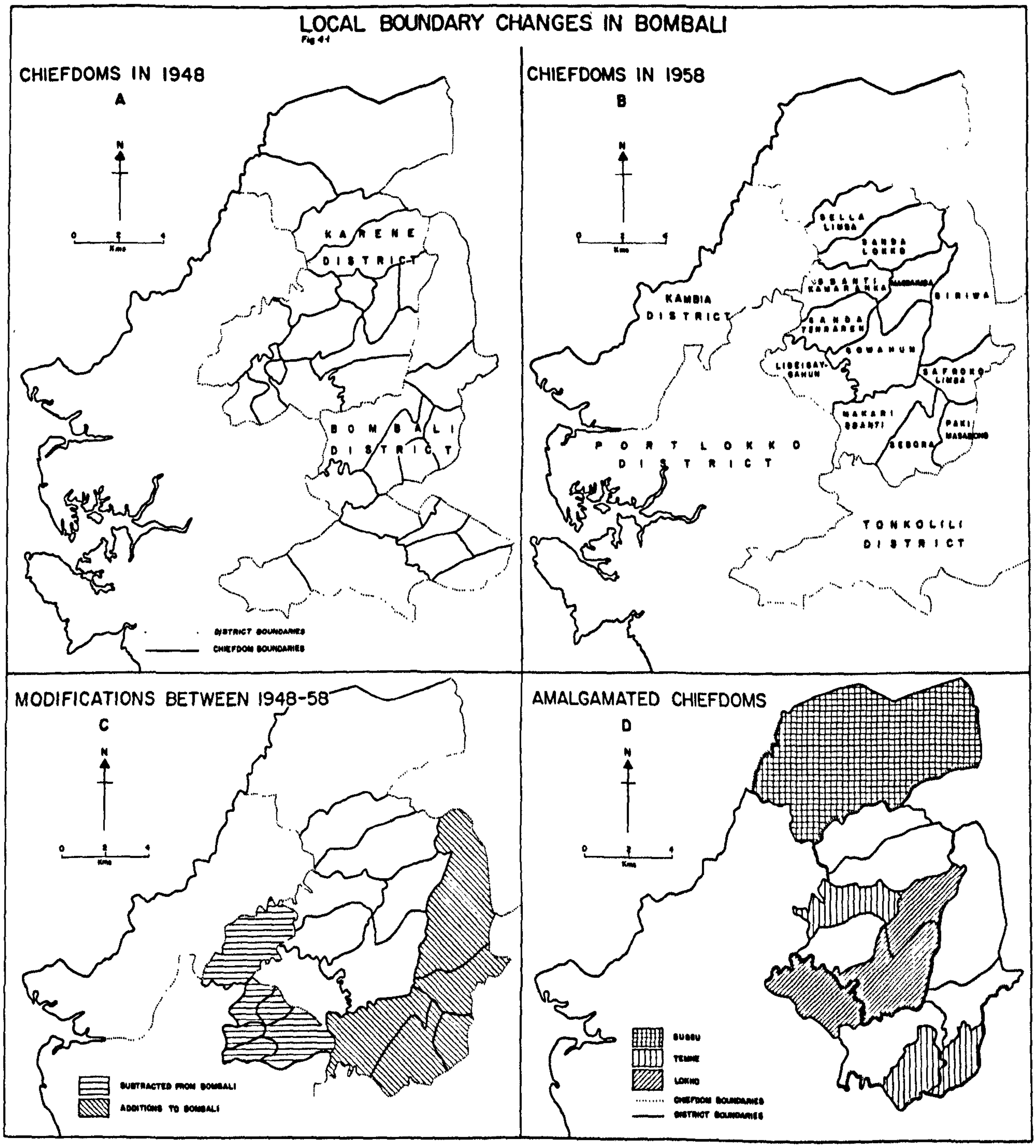
mind (1969, 75-76). In other words, development can be of various forms and the creation of development regions largely depends on the developer. In Bombali local administrative units are multi-functional and fulfill an important development condition of being under one administrative agency. Beyond this one faces the problem of tribal chieftaincy. Assuming that for a smooth transition to objective structuring of administrative units the present chiefdom boundaries are accepted with no radical changes, a government faces a massive administrative legacy in which the central authority over a chiefdom is vested in a traditional tribal ruler whose native court is empowered to function in a normal traditional way. Where 13 such establishments have tended to evolve independently of each other, the establishment of a uniform law and administration can be a difficult task at local and national levels.

While the division of territory into tribal groups had an immediate effect of pacifying people, this administrative weapon failed to achieve peaceful coexistence. There seemed to have been a misinterpretation of territoriality in tribal terms although the imposition of limits of tribal expansion generated a merging of groups at certain points of contact - the local boundaries. A tribal chief is regarded as a leader with no fixed territorial limits of power; and the supremacy of one leader over another is based on the ability to expand one's domain. There is a hierarchy of leaders ranging from the chief to the sub-chief and sub-section chief. The sub-section chief cannot hold a court

but he is empowered to collect harvest dues and report the spread of tribal settlements in new farm villages and hamlets. The extent of a chief's territory is not described by definite lines of demarcation but by the extent of settlement of a ruler's subjects. The chiefdom boundary is therefore within an undefined zone of contact between one tribal group and another; a zone that is usually inhabited by a group that has in the past been mixed through intermarriage.

An understanding of local concepts of territory did not, however, seem necessary for the early colonial administrator whose primary objective was to achieve peace at all costs and establish sound administration within the shortest period of time. One important result was the rapid development of permanent settlement and human organisation. Some of the original chiefdom boundaries were as short-lived as the phase of tribal pacification (Fig. 4.1a, b). The provision of facilities of access to administrative centres was slow, so too was administrative policy implementation. For example, in Kono country the district headquarter for the Kono tribe was in Mende country. Slater's report to the Colonial Secretary in 1925 had overtones of this apparent abnormality:

> "...though Panguma is the capital of the Kono Administrative District, it is in Mende country. Consequently Kono, like Koinadugu and parts of Karene is almost entirely undeveloped commercially and agriculturally." (1925, 12).


LOCAL BOUNDARY CHANGES IN BOMBALI
Fig 4·1
CHIEFDOMS IN 1948
A
N
KARENE
DISTRICT
BOMBALI
DISTRICT
DISTRICT BOUNDARIES
CHIEFDOM BOUNDARIES
CHIEFDOMS IN 1958
B
N
SELLA
LIMBA
SANDA
LOKKO
GBANTI
KAMARANKA
BIRIWA
SANDA
TENDAREN
GOWAHUN
LIBEISAY-
GAHUN
SAFROKO
LIMBA
MAKARI
GBANTI
SEBORA
PAKI
MASABONG
KAMBIA
DISTRICT
PORT LOKKO
DISTRICT
TONKOLILI
DISTRICT
MODIFICATIONS BETWEEN 1948-58
C
N
SUBTRACTED FROM BOMBALI
ADDITIONS TO BOMBALI
AMALGAMATED CHIEFDOMS
D
N
SUSSU
TEMNE
LOKKO
CHIEFDOM BOUNDARIES
DISTRICT BOUNDARIES

The futility of such a policy is best tested in Bombali which is an amalgamation of two former districts of Karene and Bombali. The administrative centre of Karene was Batkanu which is in Lokko country and yet the district contained Limba, Susu and Temne territories. The administrative centre for former Bombali was Makeni, a Temne town, but part of Bombali was Limba country. Modern Bombali's administrative centre, Makeni, administers Limba, Lokko, Susu and Temne territory. Changes of district and chiefdom boundaries were enormous, considering the ten-year period within which such adjustments were made. In 1948 Karene had 16 chiefdoms while its southern neighbour, Bombali had 15 (Fig. 4.1a). By 1958, Karene disappeared from the local administration map, the new Bombali contained 21 chiefdoms, 14 of which were previously under Karene. Eight of former Bombali's 15 chiefdoms were transferred to Tonkolili while two of Karene's were added to Port Lokko district (Fig.4.1c). Bombali was readjusted to contain 13 chiefdoms out of an original 21 (Fig. 4.1b). Seven of the 13 new chiefdoms were amalgamations of other administrative units and the only chiefdoms not greatly affected by internal boundary changes were Sella Limba, Sanda Lokko, Sanda Tenraren, Safroko, Biriwa and Makari Gbanti (Fig. 4.1d).

A study of present basic service patterns is capable of demonstrating the spatial impact of such rapid changes. Within Bombali the establishment of major services at Makeni has been associated with the decline of other centres. While some towns situated along major transportation routes

have expanded, others like Batkanu and the three settlements of Binkolo, Masomgbo and Kunsho, all within seven miles of Makeni and at the turn of the century larger and more important settlements, are today no more than glorified villages.

Within the amalgamated chiefdoms rivalries have erupted concerning the location of seats of power. For the early administrator, the most reasonable solution to this problem was to transfer the seat of power from the place of birth of one ruling family to that of another. For example, in Gowahun, the chiefdom centre was Bendembu until the late fifties when Kande Baba died. The new chief was elected from Kalangba which became the new chiefdom centre. This constant change of administrative centres is still practised in five of the thirteen chiefdoms in Bombali - Gowahun, Gbanti Kamaranka, Sanda Tenraren, Biriwa and Tambakha. Changes in central service locations are so frequent that local conflicts have often resulted in meaningless actions. For example, in Biriwa chiefdom the corrugated iron sheet roof of the native administration court house in Bumban was dismantled and transferred to a newly errected court house at Kamabai where the present chief resides. In situations where services like health, schools and postal agencies are not transferred a whole range of similar facilities are established at the new seat of power. There is an obvious spread of services, but this is limited to one or two chiefdom towns which consequently grow at faster rates than any others in the chiefdoms.

THE PRESENT ADMINISTRATIVE BOUNDARIES - SOME HUMAN AND PHYSICAL IMPLICATIONS

The district boundary in Bombali is 384 miles long, 57% of it runs through land and 43% (165 miles) is along streams. Part of the international boundary between Sierra Leone and Guinea marks the northern extent of Tambakha chiefdom and divides the Susu who are settled on either side of it. West of Tambakha the international boundary is parallel to the right bank of the Great Scarcies River for 22 miles and runs north eastward for 41 miles, reaching the Tambakha hills. Further south of Bombali, the Little Scarcies and its tributary the Mabole River form the western boundaries of five chiefdoms - Sella Limba, Sanda Lokko, Gbanti Kamaranka, Sanda Tenraren and Libeisaygahun. The Rokel River to the far south forms the southern boundary of Makari Gbanti, part of Sebora, the eastern boundary of Paki Masabong and part of eastern Biriwa chiefdoms (Fig. 4.1d).The area enclosed by these streams comprises two main physiographic regions - a lowland swampy region and an upland region. Yet between the Little Scarcies and Mabole Rivers there are six chiefdoms and between the Mabole and Rokel there are seven. The only river boundary forming a sharp physiographic divide is more likely to be along the upper Mabole where deep narrow valleys separate the Gowahun uplands from the mountainous region in Biriwa and Safroko Limba chiefdoms.

There are marked variations in chiefdom boundary lengths which reflect differences in the size and shape of these

Table 4.1. Characteristics of Chiefdom boundaries in Bombali, 1972

Chiefdom	Boundary length (in miles)	Land boundary (in miles)	%	River Boundary (in miles)	%	International Boundary (in miles)
Biriwa	111	89	80.2	22	19.8	
Sebora	56	50	89.3	6	10.7	
Gbanti Kamaranka	78	54	69.2	24	30.8	
Libeisaygahun	78	34	43.6	44	56.4	
Magbaimba	64	61	95.3	3	4.7	
Makari Gbanti	112	64	57.1	48	42.9	
Paki Masabong	52	28	53.8	24	46.2	
Gowahun	102	43	42.2	59	57.8	
Safroko Limba	98	74	75.5	24	24.5	
Sanda Tenraren	64	48	75.0	16	25.0	
Sanda Lokko	87	80	92.0	7	8.0	
Sella Limba	74	40	54.1	34	45.9	
Tambakha	145	64	44.1	81	55.9	63
District (External)	384	219	57.0	165	43.0	63

Table 4.2 Tribal composition of chiefdoms, 1963

Chiefdom	Temne	Limba	Lokko	Susu	Fullah	Mandingo	Others
	%	%	%	%	%	%	%
Biriwa		78.4			6.2	12.9	2.5
Sebora	77.7	4.8	2.1	1.3	4.0	3.2	6.9
Gbanti Kamaranka	88.7			3.6	6.1		1.6
Libeisaygahun	18.4		72.5		6.1	1.2	1.8
Magbaimba		7.5	76.5		5.9	6.7	3.4
Makari Gbanti	76.0	3.1	18.0		2.4		0.5
Paki Masabong	53.8	45.4					0.8
Gowahun	2.7		84.9		6.5	4.3	1.6
Safroko Limba	1.5	97.5					1.0
Sanda Tenraren	77.9		1.0		19.0	1.3	0.8
Sanda Lokko	46.7	9.2	35.3	1.0	4.5	2.8	0.5
Sella Limba	4.3	81.6		3.6	6.9	1.6	2.0
Tambakha		1.2		90.7	1.8	5.2	1.1

Source: Central Statistics Office, 1963, Freetown.

administrative units (Table 4.1). Tambakha chiefdom alone is described by a boundary that is 145 miles long. The international boundary in this chiefdom is longer than the Sebora chiefdom boundary (56 miles) and almost equal to the boundary lengths of Magbaimba and Sanda Tenraren (64 miles).

The creation of local boundaries to enclose identical tribal groups was to a large extent successful in Bombali. Excluding Paki Masabong and Sanda Lokko all other chiefdoms have a single tribe accounting for over 70% of the population (Table 4.2). In other words, the tribal composition in most chiefdoms is homogenous. Minority groups in some of these administrative units form majorities in neighbouring chiefdoms. For example, the Lokko in Makari Gbanti account for 18% of the chiefdom population while in neighbouring Gowahun it forms 84·9%. In Biriwa, 97·5% of the population is Limba, but in Gowahun and Makari Gbanti the Limba population has low representations of 0·8% and 3·1% respectively. Large tribal groups were possibly subdivided into smaller chiefdoms. For example, Biriwa, Safroko Limba and north-western Paki Masabong are predominantly Limba administrative units sharing common boundaries. Sanda Lokko, Sanda Tenraren and Gbanti Kamaranka are mainly Temne chiefdoms with common boundaries. In the south the same can be said of Sebora, Makari Gbanti and southern Paki Masabong chiefdoms.

It is fairly evident that the administrative divisions inherited from past colonial times were devised to curb

tribal uprising. By subdividing large tribal groups like the Temne, Limba and Lokko the rivalry for group supremacy was diverted from a tribal to a less powerful individual and clannish base, thereby reducing tension.

The present composition of tribal population in chiefdoms subjects the administrative system to tribal bias rather than a regional one. The entire structure for administration and development reflects a political system that is tribally deep-rooted. The problem that is often least talked about concerns the development of local thought to a standard where one does not reason in terms of tribal boundary limitations but in terms of regional and national development objectives. As a corrective measure, a radical change of local boundaries can disrupt the present administrative system and thwart any chances of improvement. Case studies do indicate that such a disruption may not be effected by the masses, but by traditional rulers whose function in a developing society is gradually losing ground.

Chiefdom boundary disputes are not frequent in Bombali. As a relatively underdeveloped part of the country the district is an area of considerable out-migration. Individual land needs are less accentuated. The most efficient means of transportation is the truck on dusty motor roads. In Bombali the few all season roads barely cut across chiefdoms. Seasonal trunk roads are few and unreliable. The general trend of chiefdoms is along an east to west axis

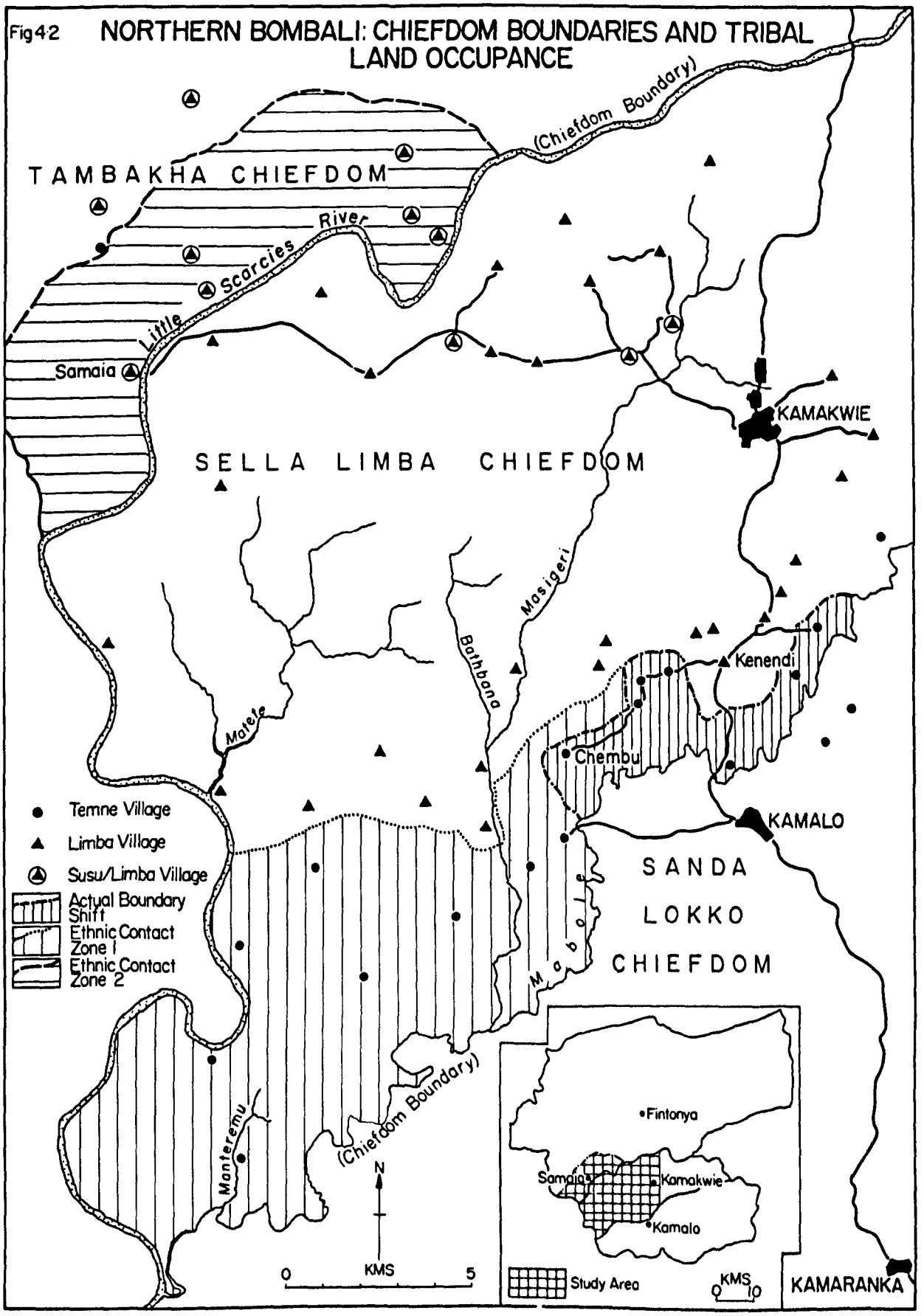


Fig42 NORTHERN BOMBALI: CHIEFDOM BOUNDARIES AND TRIBAL LAND OCCUPANCE
TAMBAKHA CHIEFDOM
(Chiefdom Boundary)
Scarcies River
Little
Samaia
KAMAKWIE
SELLA LIMBA CHIEFDOM
Masigeri
Bathbana
Kenendi
Matele
Chembu
KAMALO
SANDA LOKKO CHIEFDOM
Mabole
Temne Village
Limba Village
Susu/Limba Village
Actual Boundary Shift
Ethnic Contact Zone 1
Ethnic Contact Zone 2
Manteremu
(Chiefdom Boundary)
N
0 KMS 5
Fintonya
Samaia
Kamakwie
Kamalo
Study Area
0 KMS 10
KAMARANKA

while the main road runs north to south. Since roads are an attractive force to human occupance such an attraction is at an opposite direction to chiefdom boundaries. Consequently ethnic contacts are minimised and limited within areas of boundary intersection with a major transportation route.

Kamakwie, the chiefdom town of Sella Limba, is only eight miles from Kamalo, the chiefdom town of Sanda Lokko. The Mawolkon stream which forms the original boundary of the two chiefdoms is only one and a half miles from Kamalo. Gradual occupance of Temne farmer families had taken place north of this boundary. From Kenendi, a Limba village four miles from Kamakwie, a seasonal motor road runs westward linking the Temne village of Chembu to the main road (Fig. 4.2). Another seasonal trunk road from Kamalo runs westward reaching farm villages around the Chembu area. Intertribal marriages have taken place within this south-western part of Sella Limba chiefdom and the Temne element has wedged far into Sella country (Fig. 4.2). There are few land disputes in this mixed community of Limba and Temne; but the latter pays local tax to the Sanda rather than the Sella chief.

In 1965 the new chief at Kamakwie was faced with a problem of ruling Temne migrants who paid taxes to their original chiefdom rather than Sella, and this generated a boundary problem between the two administrative areas. Kande Luseni II, the chief at Kamakwie did not seem to hold a

strong bargaining position because 10 of his 26 wives were Temne and one of them is related to the chief at Kamalo, an older ruler who had been in power for 25 years. The Kamalo chief succeeded in directing the court to believe that what mattered was the main tribal composition of farm villages along the boundary and within the disputed territory rather than the land area involved. A survey was carried out and villages were apportioned to both administrative units according to their major tribal composition. The survey, however, had its shortcomings as women were not consulted. Chiefdom authorities assembled men of taxable age and asked them what language they spoke and what tribe they belonged to. The Limba element in the new Temne villages was mainly feminine and was not apparent during the survey.

The Temne thus succeeded in claiming territory on a tribal basis and the boundary was shifted from Mawolkon stream further north to contain villages like Chembu and Madina (Fig. 4.2). The south-western part of Sella is settled by Temne farmers. The boundary dispute did not affect this part of the chiefdom, but the precedent already set nullifies the official boundary. A more intriguing situation is that while villages were separated legally for administrative purposes there was no actual delimitation of the extent of territories of hamlets and new farm villages. Land use rights are an open question and one would have thought that an acceptance of Temne settlers in Limba country would have had a more forceful and constructive detribalising effect than the constant process of tribal isolation.

Plate 4.1. Changes in land use with Temne settlement in Sella Limba territory. The Temne house (left) is roofed with corrugated iron sheet. The backyard is relatively large forming a zone of domestic and cash crop cultivation: maize, groundnuts, potatoes and cassava. Beyond this is a zone of secondary bush (background). The absence of a forest zone indicates recent settlement.

Plate 4.2. Mixed settlement along the Sella Limba/Sanda Lokko chiefdom boundary. The grass houses to the right are of Limba settlers. More modern buildings with corrugated iron sheet roofs are recent Temne houses. Large portions of the forest belt have been cleared to increase the backyard area. The low grass with shrub vegetation (foreground) is the result of constant cultivation.

Plate 4.3a. A Limba farm in southern Sella Limba chiefdom ready for hoeing and rice broadcasting. The tree stumps are indicative of longer fallow periods (4-6 years).

Plate 4.3b. A recently acquired Temne farm in southern Sella Limba. The thin grass (foreground) is good rough pasture but the vegetation does not assure good upland rice yields. This land is more suitable for cassava and groundnut cultivation rather than rice.

Native geographical names demonstrate ample evidence that territorial scrambles took place in south-western Sella Limba chiefdom. The Mawolkon stream has a Temne name, but its main tributary, the Masigiri is Limba. Further south a distributary of the Masigiri has a Temne name -"Bathbana" which means large stream. The southernmost tributary of the Mawolkon is called "Materemu", a Temne word meaning "never to be abandoned". The south-western part of Sella Limba chiefdom has become a zone of contact. The tribal boundary between Kamalo and Kamakwie seems to have been further north than the official boundary, where some separation of Limba and Temne can be observed (Fig. 4.2).

The practice of modifying local boundaries on tribal grounds accentuates land use problems. Some differences were observed between Temne and Limba land use. The older Limba villages have traditional circular belts of tall trees and the small backyard. The Temne villages have larger backyards (Plates 4.1 & 4.2). Temne rice farms are on degraded uplands where the vegetation has been reduced to giant grasses and shrubs (Plate 4.3). The aim behind such rice farms is not necessarily maximised yields, but an establishment of squatter rights through undisturbed possession of farmland. The Limba, on the other hand, cultivate swamp rice, and the uplands are left for longer fallows after being subjected to constant groundnut cultivation.

The advantages of ethnic mixtures have not been fully exploited; but in Sella and Sanda Lokko there is ample

justification for optimism in detribalisation. Objective planning in land exploitation and the attendant services at Kamakwie and Kamalo may generate increased productivity. In this respect, emphasis can be put on co-operative farming in which rice farming is limited to the swamps and cash crops are introduced in the uplands. An amalgamation of these chiefdoms for development purposes is unlikely to create any tribal conflict as long as there is a reasonable improvement in individual farm incomes. The major obstacle may be the ruling class of chiefs and sub-chiefs who may view such changes as a threat to their livelihood.

Further north the Little Scarcies river separates Sella from Tambakha chiefdom. This boundary has never been a source of tribal conflict despite Limba transgressions of it. Limba farmers are known to farm and settle in Susu country just as the latter enjoy freehold rights in some Limba villages. It is even accepted in Tambakha that the southwestern portion of the chiefdom was originally occupied by the Limba. The story goes that Samaya, the alternate chiefdom town of Tambakha, was founded by a Limba farmer who came from Magbenkere (Fig. 4.2) Samaya in Susu means "at Sama's village". The Susu of Tambakha have always accepted the Sella Limba as one people though they are separated by an administrative boundary. As in the previous example the boundary here merely conserves tribal chieftaincy which is too traditional to absorb the preconditions of efficient administration and agricultural development.

Other chiefdom boundaries in Bombali have survived not because of a rigid limitation to territorial expansion, but because of a natural unifying element in tribal intermarriages. Ethnic mixtures of this nature are limited to boundary margins beyond which tribally homogenous cores are reached. In some instances the length of boundary separating different tribes tends to be proportional to the ethnic representation in the respective chiefdoms it separates. For example Makari Gbanti shares a longer chiefdom boundary with Gowahun and Safroko Limba than with either of the other two chiefdoms. The population in Makari isconsequently more heterogenous than that of either Gowahun or Safroko Limba. Paki Masabong shares a boundary with Temne and Limba chiefdoms; 53·8% of its population is Temne and 45·4% is Limba. Safroko Limba has a boundary length of 98 miles. It shares a 6·5 mile boundary with Gowahun chiefdom which is Lokko, a 13 mile boundary with Makari Gbanti which is predominantly Temne and the remaining 78·5 miles of boundary are with Limba chiefdoms of Biriwa and Paki Masabong. The population in Safroko is 97·5% Limba, 1·5% Temne and 0·1% Lokko (compare Table 4.2a, b).

Table 4.2a Tribal contiguity and population composition in three chiefdoms, 1963

Chiefdom	Temne %	Lokko %	Limba %
Gowahun	2·7	84·9	0·8
Makari Gbanti	76·0	18·0	3·1
Safroko Limba	1·5	0·1	97·5

Source: Central Statistics Office, 1963, Freetown.

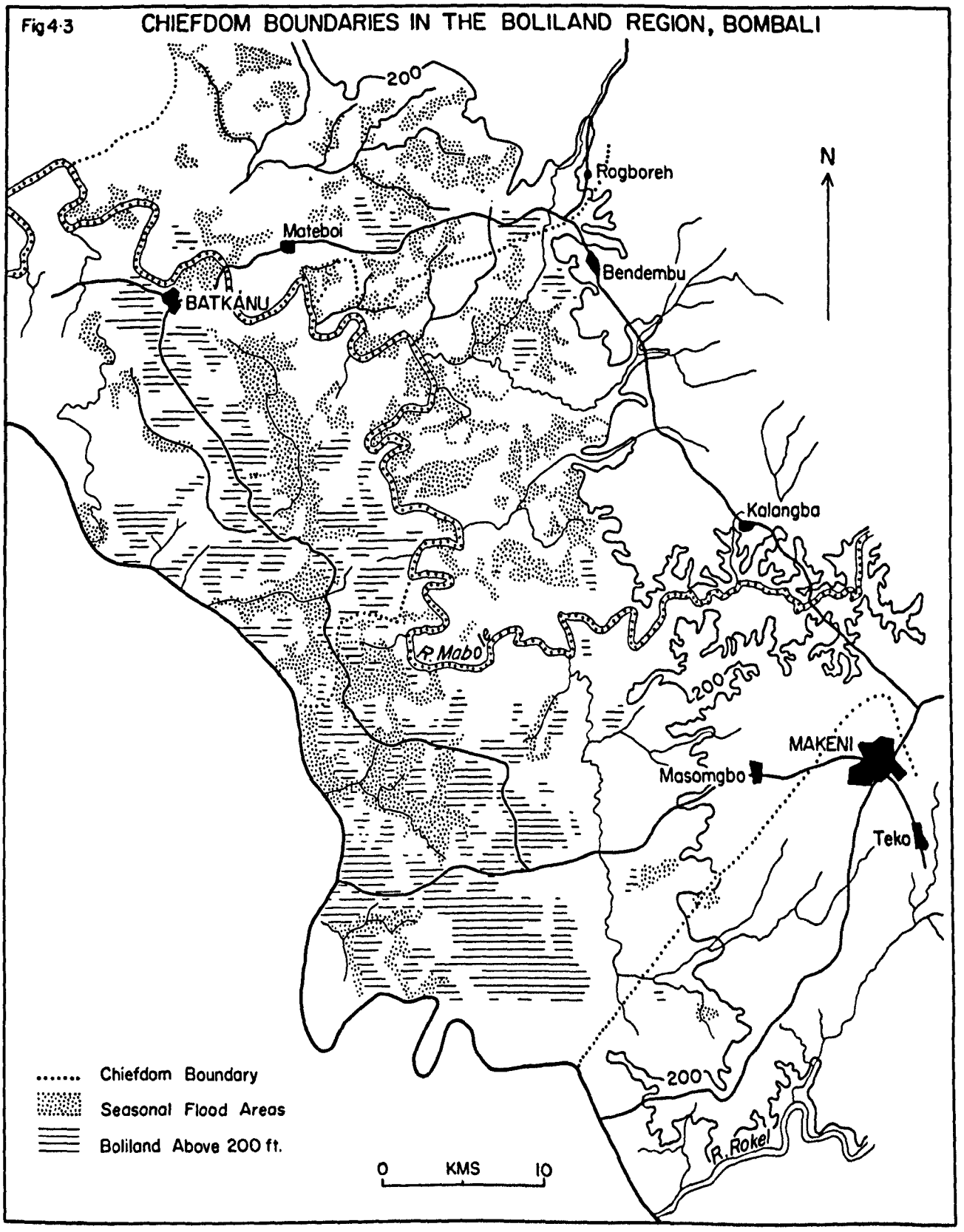
Table 4.2b Tribal contiguity and chiefdom boundary lengths in three chiefdoms (in miles)

	Gowahun	Makari Gbanti	Safroko Limba
Gowahun		25·5	6·5
Makari Gbanti	25·5		13·0
Safroko Limba	6·5	13·0	

Chiefdom boundaries in the bolilands, a fairly homogenous physical region, describe five chiefdoms - Sanda Tenraren, Makari Gbanti, Gowahun, Libeisaygahun and Sebora. The boliland region commands an advantage of a relatively complex ethnic admixture. The Fullah account for 19% of the population in Sanda Tenraren, 2·4% in Makari Gbanti, 6·5% in Gowahun, 4·0% in Sebora and 6·5% in Libeisaygahun chiefdoms. The Temne account for 18·4% of the population in Libeisaygahun which is a Lokko chiefdom. The study area is 286 square miles in area, roughly enclosed by a rectangular network of roads linking Makeni, Kalangba, Bendembu, Batkanu and Masomgbo (Fig. 4.3).

The main occupations for settlers in this region are swamp rice cultivation and cattle rearing. Individual farm acreages are small and there seems to be an abundance of unexploited swamp land. One limitation to increased individual acreage may be related to problems of access. Road development has been slow because of high expenses involved in construction across swamps. Government development efforts have concentrated on large-scale mechanical ploughing and

Fig 4·3 CHIEFDOM BOUNDARIES IN THE BOLILAND REGION, BOMBALI



sub-allocation of ploughed land to individual tenants. The scheme started in 1951 but it appears that the absentee tenants from the big towns and mining areas have had a better bite of this cake. Yet, so undisturbed are settlers in the four chiefdoms that they have tolerated external exploitation for 20 years. The new townsmen from Makeni, Kono, Lunsar and Port Lokko are normally relatives of peasant settlers in the bolilands. They know that their relatives can hardly afford to pay £2.50 for a ploughed acre of swampland. They are also aware of the fact that their relatives are accustomed to intercropping for the provision of domestic food needs rather than market needs. They also know that their peasant relatives trust their motives in absentee landlordism far more than government motives in mechanisation. The periodic visits of such town dwellers to their places of birth reassures the peasant of the unbreakable structure of the family and its extensions. The participation in local farming by a town dweller reassures the villager that his relative will always defend family land rights.

In the absence of qualitative reports on the performance of government development schemes, it is not surprising that some authoritative circles in agricultural development think that African customary land law is so advantageous that the phenomenon of absentee land lordism and a landless peasantry has not so far appeared (Mifsud, 1967, 2)

By 1968, however, Pollock had observed a subtle development of absentee landlordism in the bolilands, a sort backed by politicians and important policy makers (Pollock, 1968). Future boundary problems will be generated by these growing numbers of absentee landlords who are more interested in profiteering and large-scale farming. One possible corrective measure concerns the construction of feeder roads, health and educational establishments and the introduction of settler schemes based on mixed farming. The peasantry can be much more interested in its development as a human resource than in its perpetual subjection to tradition. This sort of local feeling is clearly illustrated in Sebora chiefdom where Makeni is spreading beyond the bounds of its chiefdom. Land sales are booming and the northern extent of Sebora wedges into Makari Gbanti even though there are no official changes in boundaries.

The Sierra Leone/Guinea border north of Bombali has similar characteristics to chiefdom boundaries. The presence of identical tribal groups on either side of the boundary, the difficulty of controlling human movements in a region where most of the roads are footpaths and the current contradiction in the actual location of an administrative divide are common obstacles to efficient administration and development. Officially the international boundary between the two countries is known to be demarcated. Earlier maps of this part of the country indicate actual boundary posts marking territorial limits (Fig. 4.4a). Recent maps do not show these details nor have they any indication of a boundary

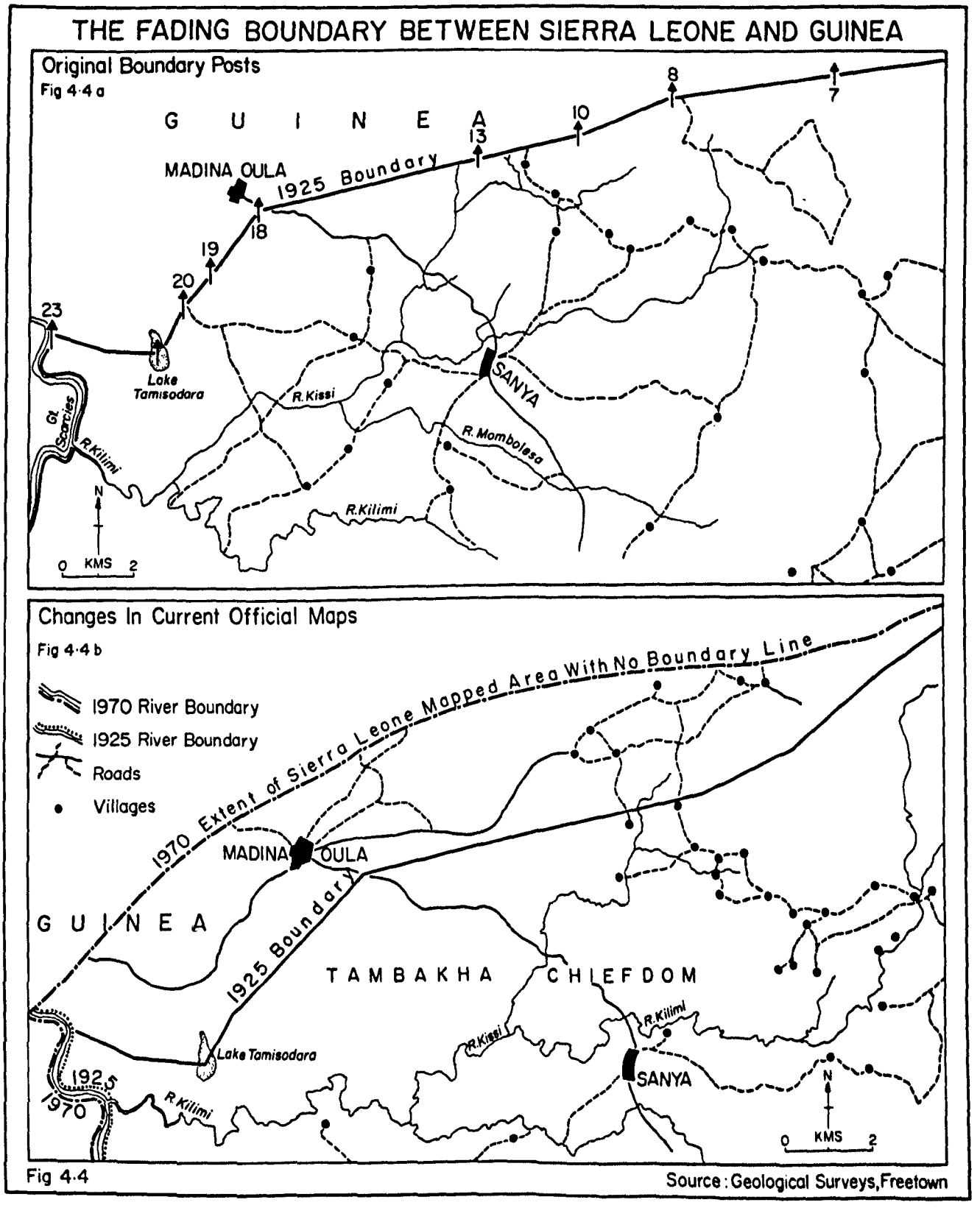


Fig 4·4

Source: Geological Surveys, Freetown

line. There is thus a growing uncertainty about an actual line of demarcation between Sierra Leone and Guinea (Fig. 4.4b).

The main footpaths linking villages north-east of Samaya converge on Madina Oula which is a Guinea outpost. The only motorable road from Kamakwie links Sanya to Madina Oula, but this road is three to four miles away from villages east of Sanya (Fig. 4.4b). A more intriguing situation concerns the actual location of the boundary along the Great Scarcies River. A 1925 Sierra Leone map indicates the boundary along the left bank of the Great Scarcies, but all other current maps place it on the right. The 1970 topographic sheets of this area clearly state that the international boundary follows the right bank of the river, even though there is an indication on the map that other parts of the boundary are not shown (Fig. 4.4b). Guinean maps have always indicated the boundary on the left bank. The important point to note is that the location of this boundary on either side of the Great Scarcies could have been convenient for colonial administrations; with the achievement of nationhood it is difficult to imagine that either side can be satisfied in placing the boundary along a bank. Rather than regarding this boundary as a source of conflict, potentially, President Sekou Touré of Guinea stated in 1971 that there is no need for a boundary between the two countries. Local opinions about this comment have not been tested but the establishment of a batallion of the Sierra Leone armed forces at Makeni in 1971 may have far-reaching implications.

AREA AND POPULATION COMPACTNESS: THE PROBLEM OF BEST-FIT GEOMETRIC FIGURES IN CHIEFDOMS

Chiefdom boundaries in Bombali have not been greatly modified since 1961, when the country achieved independence. The definition of administrative areas for more efficient human organisation must have some high priority if this new nation hopes to develop its hinterland. The modification of present local boundaries without generating social instability, the location of chiefdom towns and the attendant problems of access to these towns, and the physical characteristics of chiefdoms as well as population distribution patterns are a few topics that can explain limitations in chiefdoms as functional areas. More theoretical aspects of chiefdom variations in shape and form can only be related to these problems for a better understanding of the structural characteristics of these local administrative units.

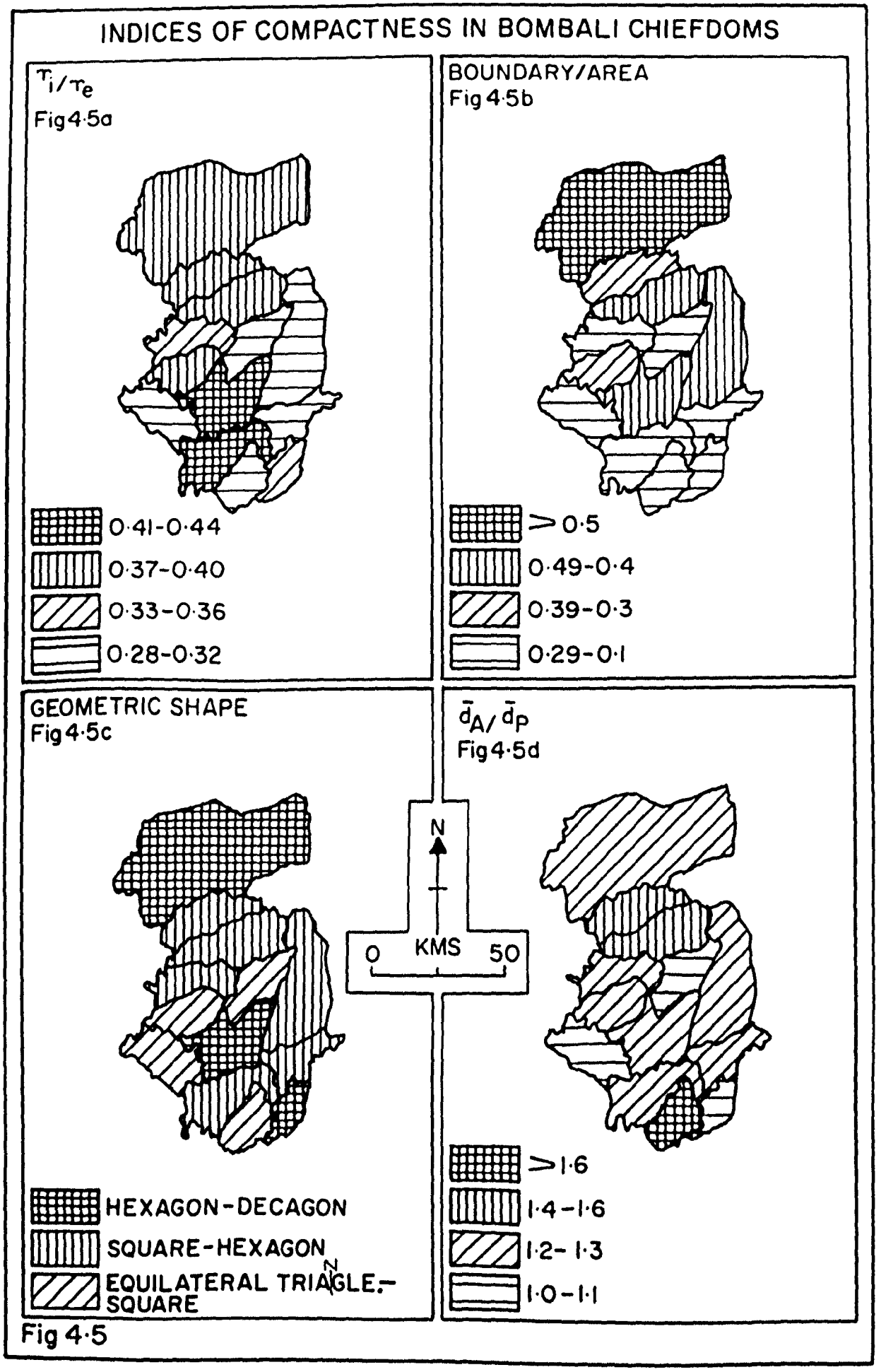
Measurements of shape and form in geographical analysis, however, are still in an experimental stage and there appears to be no single method that has had a conclusive acceptance (Note 4.1). The basic problems in measurements of shape stem from the minimal comparability of results between one method and another; and the problem of relating the abstract to real situations. In this study of shape, aspects of compactness are emphasised and shape is examined in relation to a functional rather than a geometric centre. The selection of a functional centre may be arbitrary or deterministic; but it is more meaningful in assessing the functional essence

of a traditional centre of administration considering the fact that the determinants of a chiefdom town location are traditional and subjective. Also, in human geography, studies of shapes tend to be more meaningful when related to their impact on population distribution within given areas.

The first measure of shape in this study produces general variations in outline compactness of chiefdoms. The index of outline compactness is obtained from the ratio of the radius of the largest inscribed circle (^{r}I) to that of the smallest circumscribing circle (^{r}E) of a given chiefdom (i.e. $^{r}I/r_{E}$). A second measure of compactness is expressed by the ratio of the length of a chiefdom boundary, to the area of the enclosed chiefdom (i.e. length of boundary/area). The third measure is an index of dimensionless area compactness derived from the ratio of two indices of area compactness - a) the mean distance of a chiefdom area ($^{\bar{d}}A$) from its administrative centre, and b) the mean distance of a circle of equal area ($^{\bar{d}}r$) from the centre (i.e. $^{\bar{d}}r/\bar{d}_{A}$). A second index of dimensionless compactness, that of population, is derived from the ratio of the mean distance of chiefdom area ($^{\bar{d}}A$) to the mean distance of chiefdom population ($^{\bar{d}}p$) from the chiefdom town (i.e. $^{\bar{d}}A/\bar{d}_{p}$). These measures are not highly comparable but they indicate variations that are useful in assessing the viability of chiefdoms as administrative and development areas (Table 4.3). For example, the index of outline compactness increases towards 1·0 while the ratio of boundary to area is the

Table 4.3 Some indices of compactness in Bombali Chiefdoms

Chiefdom	Area (sq.mls)	Boundary Length (miles)	Boundary area	T_I	r_E	$\frac{r_I}{r_E}$	$\bar{d}_A$	$\bar{d}_r$	$\frac{\bar{d}_r}{\bar{d}_A}$	$\bar{d}_P$	$\frac{\bar{d}_A}{\bar{d}_P}$
Biriwa	283	111	0.39	5.5	17.6	0.31	9.3	6.3	0.68	7.6	1.2
Sebora	97	56	58	3.0	9.3	0.32	8.4	3.9	0.46	3.7	2.3
Gbanti Kamaranka	148	78	0.53	4.0	11.5	0.35	6.9	5.0	0.72	5.9	1.2
Libeisaygahun	147	78	0.53	3.3	11,6	0.28	8.1	4.8	0.59	7.7	1.1
Magbaimba	98	64	0.65	3.5	11.0	0.32	7.7	3.8	0.49	6.8	1.1
Makari Gbanti	219	112	0.51	6.0	14.6	0.41	7.8	6.1	0.78	6.0	1.3
Paki Masbong	79	52	0.67	3.5	10.0	0.35	4.3	3.6	0.84	4.2	1.0
Gowahun	285	102	0.36	6.5	15.0	0.43	7.4	6.6	0.90	6.1	1.2
Safroko Limba	149	98	0.66	3.5	11.8	0.30	7.2	4.8	0.67	6.0	1.2
Sanda Tenraren	139	64	0.46	4.1	10.8	0.38	9.0	4.5	0.50	7.4	1.2
Sanda Lokko	228	87	0.38	5.8	14.4	0.40	9.0	5.8	0.64	6.0	1.5
Sella Limba	150	74	0.49	4.3	17.8	0.39	5.9	4.5	0.77	3.8	1.6
Tambakha	880	145	0.17	10.4	26.3	o.40	13.1	11.4	0.88	10.0	1.3


INDICES OF COMPACTNESS IN BOMBALI CHIEFDOMS
T_i/T_e
Fig 4·5a
0·41-0·44
0·37-0·40
0·33-0·36
0·28-0·32
BOUNDARY/AREA
Fig 4·5b
>0·5
0·49-0·4
0·39-0·3
0·29-0·1
GEOMETRIC SHAPE
Fig 4·5c
HEXAGON-DECAGON
SQUARE-HEXAGON
EQUILATERAL TRIANGLE-SQUARE
N
0 KMS 50
$\bar{d}_A/\bar{d}_P$
Fig 4·5d
>1·6
1·4-1·6
1·2-1·3
1·0-1·1
Fig 4·5

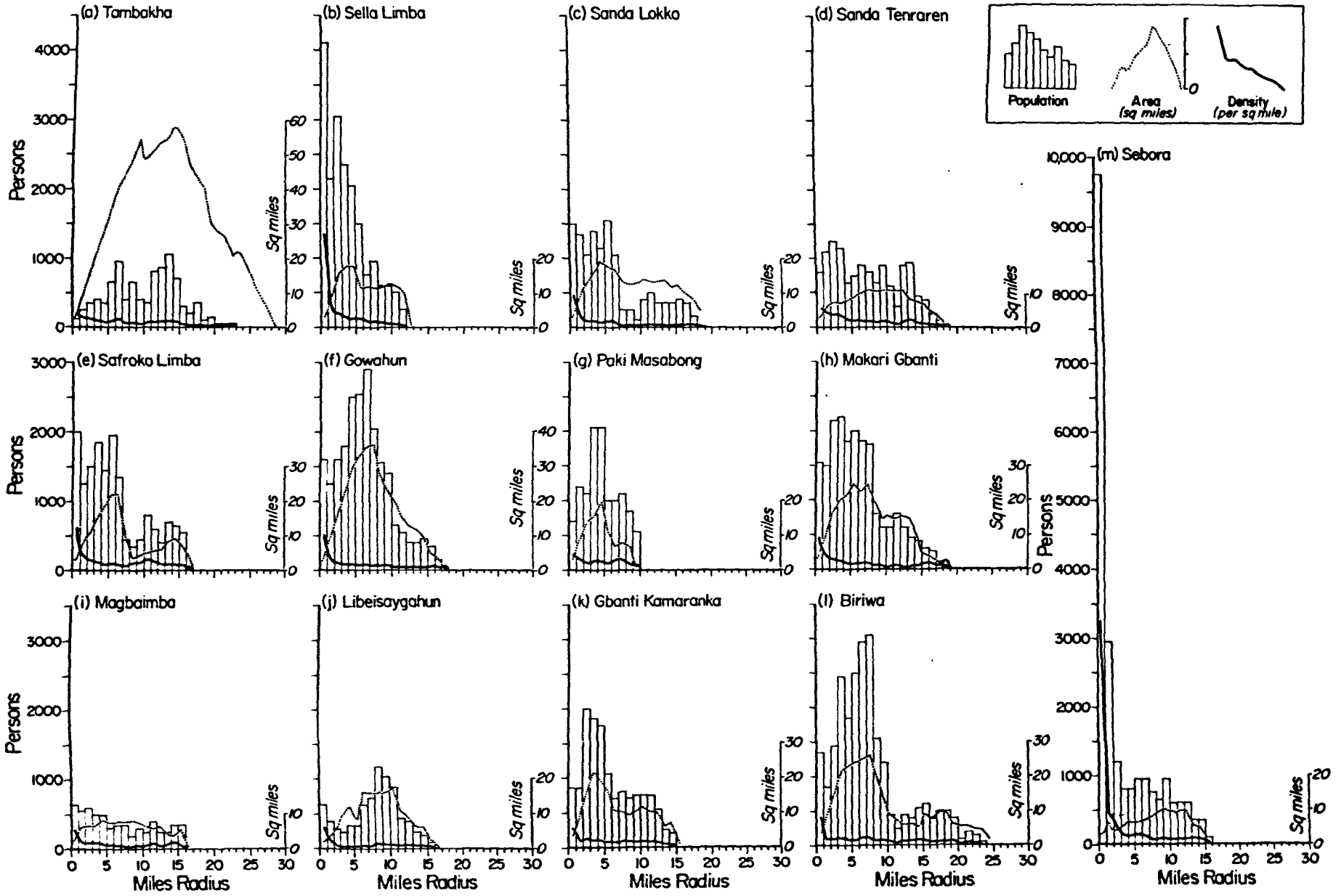
converse, giving a higher value of compactness with decreasing values from 1·0. The index of dimensionless population compactness has a lowest expected value of 1·0. The index of dimensionless area compactness is the deviation of a given shape from the circle which has an index of 1·0. In the first index ($^{r}I/r_{E}$) variations in shapes of administrative areas tend to be determined by the bulkiness of the administrative unit (^{r}I) and its general elongation (^{r}E). In the second index the size of the administrative unit (area) tends to determine its level of compactness. There are thus two measures of the general forms of chiefdoms and two others concerning form with respect to the location of chiefdom towns.

Values obtained on the index of outline compactness are grouped into four categories ranging from high to very low (Fig. 4.5a). Sanda Lokko, Gowahun, and Makari Gbanti have relatively high values of outline compactness. Tambakha, Sella Limba and Sanda Tenraren have medium values, while Libeisaygahun, Safroko Limba and Biriwa have very low indices of outline compactness. The ratio of boundary to area is lowest in Tambakha, Gowahun and Biriwa, indicating higher levels of compactness. These three chiefdoms are the largest individual units in Bombali. Smaller chiefdoms like Magbaimba and Paki Masabong had higher ratios, and hence, lower indices of compactness. The importance of this particular ratio stems from the premise ¬ all things being equal a larger political unit has more potential than a smaller one. Variations that obtain in chiefdoms are illustrated

in Figure 4.5b. An interesting situation is that smaller chiefdoms tend to be more populated.

The variations observed in compactness can be more meaningful when related to aspects like the amount of rugged terrain in the respective chiefdoms and the location of chiefdom towns. The latter is of greater significance because one is interested in assessing problems of access in terms of distance from an administrative centre. For example, in all the chiefdoms in Bombali, the mean distance of area from individual administrative centres is higher than the mean distance of population (Table 4.3). There are however, inter-chiefdom variations which reflect the attractive force of individual chiefdom towns to outlying settlements and the problem of access in a given topography. For example, in Sebora chiefdom the mean distance of population from Makeni, the chiefdom town, is 3·7 miles, while the mean distance of chiefdom area is 8·4 miles, indicating a higher hinterland population attraction to the administrative centre. In Paki Masabong the mean distance of area (4·3 miles) is almost equal to that of population. Similarly, in Tambakha chiefdom the mean distance of population is as high as that of area (Table 4.3). Overhead costs in the provision of access facilities are generally higher and less economical in administrative areas with more distant population from the administrative centre. In other words, chiefdoms with lower values of dimensionless population compactness ($\bar{d}_A/\bar{d}_p$) tend to have greater demands for

Fig 4·6. Mean Distances of Area, Population and Population Densities from Chiefdom Towns



access facilities (Fig. 4.5b).

Within the chiefdoms, population densities tend to decline away from the chiefdom towns (Figs. 4.6 a-m). In the Sebora and Sella Limba chiefdoms this decline is very sharp (Fig. 4.6b,m). Some hierarchical structures within and without chiefdoms are observable though actual sizes of settlements are not compared. For example the population density within a radius of one mile in Makeni (Sebora chiefdom) is 2·5 times that of Kamakwie (Sella Limba) and 85 times that of Fintonya (Tambakha), the smallest chiefdom town in Bombali (Table 4.4). One thus obtains a crude primacy ratio of chiefdom towns explained by an analysis of area and population density patterns of chiefdoms, with incremental radii of one mile from these administrative centres.

The area between the first and second radius from the chiefdom town describes an annulus with a lower range of primacy than the first radius. The density of population at this annulus is only 18 times that of Tambakha but this does not improve the latter's rank. Only Kamakwie and Makeni retain their higher ranks. Towns like Kalangba, Kamabai, Binkolo and Kagbaray with lower ranks in this annulus do not have trunk roads within a two mile radius. Rogboreh has an improved rank and has two trunk roads within a radius of two miles. Masomgbo and Mapaki have improved ranks; the former town is only five miles from Makeni while the latter is located between two district headquarters of Magboraka

Table 4.4 An assessment of chiefdom town primacy by population density

Chiefdom Town	Chiefdom	Primacy at 1 mile radius	Rank	Primacy at 2nd mile	Rank
Makeni	Sebora	1.0	1	1.0	1
Kamakwie	Sella Limba	2.5	2	2.1	2
Binkolo	Safroko Limba	5.1	3	3.1	5
Kalangba	Gowahun	6.4	4	3.6	7
Masomgbo	Makari Gbanti	6.6	5	3.0	4
Kamalo	Sanda Lokko	6.8	6	3.2	6
Kamabai	Biriwa	7.6	7	4.0	10
Batkanu	Libeisaygahun	10.1	8	4.5	11
Rogboreh	Sanda Tenraren	11.4	9	2.4	3
Kamaranka	Gbanti Kamaranka	12.0	10	3.7	9
Kagbaray	Magbaimba	12.5	11	4.9	12
Mapaki	Paki Masabong	14.6	12	3.6	7
Fintonya	Tambakha	85.0	13	17.9	13

and Makeni which are only 15 miles apart. Towns with hinterlands of difficult terrain and having lower ranks in the annulus are Binkolo, Kamabai, Batkanu and Kagbaray.

The variations in primacy ratios are higher in the first radius and it is probable that beyond the built -up areas of these glorified villages called towns, human occupance, administration and development tend to be restrained by similar factors of access, rugged terrain and the nature of population distribution in a peasant agricultural system. This probability is tested in the next chapter which deals with the distribution of services in the district. At this stage, one is limited to an assessment of general variations of population and area, with respect to shapes of chiefdoms.

Values obtained for the dimensionless compactness of population range from 1·0 to 2·3 (Table 4.3). Paki Masabong, Magbaimba and Libeisaygahun have values under 1·2 (Fig. 4·5b) compared with a relatively high value of 2·3 in Sebora, 1·6 in Sella Limba and 1·5 in Sanda Lokko chiefdoms. Most of the other chiefdoms have low to medium values - Tambakha, Gowahun, Sanda Tenraren, Safroko Limba, Makari Gbanti, Gbanti Kamaranka and Biriwa, which are medium to large in area and have lower densities of population. There are some interesting contrasts between the dimensionless compactness of area and population. Chiefdoms with higher values of dimensionless area compactness, like Tambakha, Gowahun and Paki Masabong have low values of population compactness. In other words, the areal forms of

some chiefdoms contrast with their population compactness. Such a contrast is associated with structural weaknesses within chiefdoms which may be too large in terms of the functional capacity of its administrative centre. The chiefdom town itself may be located at too far a distance from the point of minimum aggregate travel within the administrative unit and this can affect administrative and development efforts irrespective of the size of the chiefdom.

In Bombali, no chiefdom has a circular shape which is generally accepted as the ideal for functional efficiency. According to Haggett's values of geometric shapes, a circle has a value of 1·0; a ten-sided polygon, 0·935; a hexagon, 0·827; a square,0·637; and an equilateral triangle, 0·413 (1965, 50-51). Comparing these standard values with those obtained for dimensionless area compactness in chiefdoms (Table 4.3), one finds that Tambakha, Gowahun and Paki Masabong are of geometric forms between a hexagon and a ten-sided polygon. Six chiefdoms have values between hexagons and square forms - Biriwa, Sanda Tenraren, Makari Gbanti, Safroko Limba, Sanda Lokko and Sella Limba. Four have values between a square and a triangle (Fig.4.5c). Chiefdoms with geometric forms similar to an equilateral triangle tend to have their chiefdom towns farthest away from points of minimum aggregate travel - Sebora, Magbaimba and Sanda Tenraren.

Chiefdom boundaries were, however, not instituted on a basis of spatial rationality but on that of indirect rule.

In nationhood, indirect rule has adverse effects on multi-tribal communities. One of the greatest tasks in the internal administration of new nations involves a process of de-tribalisation to subdue clannish and tribal interests in the face of national aspirations. Studies in tribal conflicts are numerous but these have had little relevance to development studies because there are no clearcut solutions to deeply based human conflicts. Adejuyigbe's study of problems of political unification in Nigeria (1967) is a detailed work on local conflicts, but the suggested solutions in his conclusions(344ff.) have not been heeded. In his study of Nigeria's state political structure Sada suggests the creation of administrative units in which the ethnic composition of population is balanced enough to prevent group supremacy:

> ..."the prospects of stability are very high in a state where ethnic groups are sufficiently many and balanced in numerical strength to prevent one single group from dominating the rest."(Sada, 1971).

In other words, internal administrative units in a multi-tribal nation must be heterogenous in ethnic composition to achieve national stability.

THE CRITERIA IN CHIEFDOM DELINEATION AND PROBLEMS OF BOUNDARY MODIFICATION

If chiefdoms are to outlive their traditional essence, they should be flexible enough to absorb adjustments that would generate local administrative units befitting a devel-

oping society. In Bombali these adjustments are more likely to be dependent upon local attitudes towards changes in boundaries and upon the ability to subject tribal interests to national priorities. Sada's suggestions are that for more efficient administration, low density population areas should be converted to special development projects; ethnic and minority areas should be merged with adjoining administrative units most of which are inhabited by ethnic groups of the same origin; and that administrative areas with difficult terrain should be made as compact and small as is possible and as is compatible within economic and cultural limitations (20).

Based on Sada's suggestions and on the indices of shape in Bombali chiefdoms, changes in boundaries are necessary for economic progress and efficient administration. This option must come from the people and their rulers, and where it is not forthcoming any attempts at changes can be disasterous. A few important characteristics of present chiefdoms in Bombali have been briefly summarised to indicate individual chiefdom weaknesses (Table 4.5). For example, Tambakha, the largest chiefdom in Bombali, has a high value of dimensionless area compactness, but population compactness is low. The density of population is 11 people per square mile. About 23·8% of the chiefdom is rugged terrain and the largest single tribe, the Susu, account for 90·7% of the chiefdom population. Based on Sada's conditions for national stability this chiefdom can be declared a national development area.

Table 4.5 Some characteristics of chiefdoms in Bombali

Chiefdom	Area (in sq. miles)	1963 population	density (per sq. ml)	% largest tribe	length of motorable roads	road length / area	% rugged terrain	area compactness index	population compactness index
Biriwa	283	24,546	87	78.4	40	0.14	48.1	0.68	1.2
Sebora	97	22,078	228	77.7	41	0.42	0.0	0.46	2.3
Gbanti Kamaranka	148	13,921	94	88.7	27	0.18	4.6	0.72	1.2
Libeisaygahun	147	8,384	57	72.5	36	0.25	0.0	0.59	1.1
Magbaimba	98	6,124	62	76.5	9	0.09	23.7	0.49	1.1
Makari Gbanti	219	19,696	90	76.0	46	0.21	0.2	0.78	1.3
Paki Masabong	79	11,227	142	53.8	10	0.13	6.3	0.84	1.0
Gowahun	285	22,141	78	84.9	29	0.10	6.3	0.90	1.2
Safroko Limba	149	16,612	112	97.5	15	0.10	13.2	0.67	1.2
Sanda Tenraren	139	12,922	93	77.9	27	0.19	3.6	0.50	1.2
Sanda Lokko	228	12,528	55	46.7	16	0.07	17.2	0.64	1.5
Sella Limba	150	18,763	125	81.6	41	0.27	3.0	0177	1.6
Tambakha	880	9,784	11	90.7	45	0.05	23.8	0.88	1.3

In Sella Limba the dimensionless compactness of area and population is medium and the density of population is relatively high (125 persons per sq. mile). Only 3·0% of the chiefdom is of rugged terrain; and the Limba alone account for 81·6% of the 18,763 people in the chiefdom. This high level of tribal homogeneity is a weakness in Sella chiefdom. In Sanda Lokko chiefdom the largest tribal group accounts for only 46·7% of the total population, but the Lokko and Limba respectively account for 35·3% and 9·2%. These large minority tribes are majority groups in Magbaimba and Sella Limba which are contiguous. (Table 4.2). A fairly large part of the chiefdom is of rugged terrain (17·2%) and the density of population (55 per sq, mile) is lower than the district average of 69 per sq. mile. So that even though the chiefdom is fairly compact in area and population it has attendant problems of terrain and ethnic mixtures.

In Sanda Tenraren 77·9% of the population is Temne. The non-indigenous Fullah account for 19·5% of the population while the remaining 2·6% is accounted for by neighbouring tribes. The density of population is medium (93 per sq. mile). Only 3·6% of this chiefdom is off rugged terrain but it is compact in area and population. In Safroko Limba 97·5% of the people are Limba. In neighbouring Paki Masabong this tribe accounts for 45·4% of the population. North of Safroko in Biriwa 78·4% of the population is also Limba. In other words Safroko chiefdom is not only least diverse in tribal composition, it also shares common administrative boundaries with identical groups. The area compactness is low and 13·2%

of the chiefdom is of rugged terrain. Gowahun chiefdom has a high index of area compactness but a low population compactness ratio. Only 6·3% of the chiefdom is rugged terrain. Although the density of population is above the district average, the Lokko alone form 84·9% of the population.

Higher percentages of ethnic minorities, and hence greater ethnic mixtures are observed in Makari Gbanti, Magbaimba, and Libeisaygahun; but like most other cases these minorities are major groups in neighbouring chiefdoms. For example, 18·4 % of the population of Libeisaygahun is Temne, but in Mkari Gbanti to the south this tribe forms 76·0% of the population. In Magbaimba 23·7% of the land is rugged, the density of population is low, as well as its compactness. Contrasting with these three chiefdoms is Paki Masabong which has a relatively high population density (142 per sq. mile) a high level of ethnic heterogeneity and a high index of area compactness. Population compactness is however lowest in this chiefdom even though only 6·3% of the land is rugged.

In Gbanti Kamaranka, only 11·3% of the population is not Temne. The Fullah and Susu respectively account for 6·1% and 3·6% of the population. The chiefdom has low indices of area and population compactness. Sebora chiefdom has the highest density of population (228 per sq. mile) but 77·7% of its people are Temne. The Limba, Fullah

Mende, Lokko and Susu together form 17·9% of this chiefdom's population (Table 4.2). There is no rugged terrain but Sebora is least compact in area. Contrasting to Sebora is Biriwa to the east where 48·1% of the land is rugged, and the population density drops to 87 per sq. mile. The main minority tribes in this chiefdom are the Mandingo, (12·9%) and Fullah (6·2%), groups that are non-indigenous.

Evidently the basic conditions for chiefdom structures do not fully obtain in any one chiefdom in Bombali. Excluding Sebora and Sella Limba, the ratios of motorable roads to chiefdom areas are very low, and this is especially significant in Tambakha, Sanda Lokko, Safroko Limba, Magbaimba, and Biriwa, where over 10% of the terrain is rugged. Similarly, chiefdoms with low population densities tend to be least compact and this reflects the administrative burden of reaching dispersed settlements from chiefdom towns. Changes in present local boundaries can be a difficult exercise considering the present limitations of traditional and tribal rulers. Modifications should be designed to minimise the disparity in sizes of local administrative units, to increase their diversity of ethnic groups without straining the present infrastructural patterns and more important, current traditional norms. Settlement schemes involving all tribes should be encouraged and these schemes may well be successful provided that chiefdoms are grouped into development project areas within the district. One subtle condition in such project areas is that each should contain at least three different tribal rulers. Such a move may have the much

needed effect of inducing local authorities to start thinking of regional rather than chiefdom priorities.

Much optimism cannot, however, be placed on possible changes in attitudes of traditional rulers towards the designation of development project areas, even though this does not mean a change in the status of chiefdoms. Operations of this nature may be successful provided suggestions to this end were made by chiefs themselves. Otherwise, development project areas may be regarded as a thoughtless imposition of demands on rulers. The development officer's services are most needed at this stage to direct the thoughts of local authorities towards this objective. Experience in local administration has proved that while traditional rule cannot be phased out immediatley, much can be achieved by some subtle direction of local leadership.

This very important aspect of early colonial rule does not seem to be currently exploited and the result of introducing legislative changes without the backing of chiefs has had its side-effects in several instances. The introduction of court presidents and chiefdom speakers in local administration during the early sixties did not only tend to rob chiefs of their legal powers, but also the traditional belief in their absolute wisdom. The internal instability engendered by such a policy has left chiefs with alternatives associated with feudalism and unflinching support for what they believe to be government ambitions. A current

report on activities of chiefs in Sierra Leone politics brings out much of this attitude:

> "At a meeting of paramount chiefs from all over the country, a resolution was passed calling for a one party system of government...other chiefs claimed that much of the trouble in chiefdoms was created by speakers and court presidents who considered themselves more important than chiefs."(West Africa Review, 1972, 639).

Another major obstacle to boundary changes concerns the implications such modifications may have on neighbouring districts. Western Bombali forms the eastern margin of the boliland area which extends to Brimaia and Tonko Limba chiefdoms in Kambia district: Kholifa, Kholifa Mabang and Malal in Tonkolili district: and Sanda Magbolonto chiefdom in Port Lokko district. In other words, the physical regions in Bombali are simple extensions of what obtain in neighbouring districts. Similarly, tribal chiefdoms tend to be contiguous to identical groups in the neighbouring districts. Hence, the problems of local boundaries in Bombali transcend regional administrative units. In this respect, these are national problems which must interest people keen on accelarated development of the country.

NOTE 4.1

The most current definitive work on the measurement of shape, in geography, is by Blair and Biss (1967). Other important previous works include Bunge (1962), Boyce and Clark (1964), Stoddart (1965) and Haggett (1965). The basic interest in boundaries and the shapes they describe lies in the problems and limitations they impose on human organisations. When consideration is given to the fact that local boundaries in most underdeveloped areas were not delineated on geometric lines, the complexity of problems that can be involved in possible modifications have human and economic implications. The use of shape in this study is related with the functional efficiency of chiefdoms which are administered from chiefdom towns. The functional centre for this study is thus the chiefdom town; and the chiefdom's efficiency is measured by the mean distance from any point within the chiefdom to the chiefdom town. The distances of chiefdom area and population from the chiefdom town are other useful measures of efficiency.

The mean distance of area from the administrative centre is calculated by means of concentric circles of incremental radii of one mile. Since the lengths of concentric arcs are proportional to the areas at the appropriate distances, it is possible to calculate frequencies of area at given distances from administrative areas. Hence, $\Sigma \bar{d}_A = \frac{\Sigma Ad}{\Sigma A}$;

and for a circle of equal area $\Sigma \bar{d}_r = 2/3 \sqrt{\frac{A}{11}}$.

The area of a complete annulus described by inner and outer radii r_1 , r_2 and perimeters P_1, P_2 $= \left(\frac{r_2}{2}\right) P_2 - \left(\frac{r_1}{2}\right) P_1$;

and for an incomplete annulus of radii r_i, r_j and perimeters P_i and P_j,

$$\text{Area} = \frac{P_j + P_i}{2} \quad ((r_i - r_j) = \frac{(P_j + P_i)}{2} (r_i - r_j).$$

Indentations are calculated manually and added or subtrated as the case may be. The mean distance of population is calculated by using the class midpoint of population within an annulus described by radii r_i, r_j ; i.e.

$$\sqrt{\frac{r_i^2 + r_j^2}{2}} .$$

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CHAPTER V

THE INFRASTRUCTURE IN BOMBALI

INTRODUCTION

The infrastructure of Bombali has been studied under two main topics: a) the system of transportation and b) the distribution of basic services. Both characteristics are fairly simple and typical of hinterland situations of a colonial market oriented system. Feeder roads have started developing and services tend to be concentrated at administrative centres. For several years, Makeni was the terminus of the railway in Northern Sierra Leone. The motor roads that were later constructed to converge on this township were a secondary development of a large hinterland's transportation system. The railway has now been phased out in this part of the country and replaced by motor transportation. In other words, hinterland routes are presently the primary lines of communication, and this study puts special emphasis on this change within the district. The importance of individual settlements and chiefdoms is studied in relation to other parts of the district without considering: a) the old railway, which has had greater effect on the growth of Makeni, and b) national infrastructures which give greater importance to the district centre. By omitting these two important factors, it has been possible to examine the district as if it had been a closed infrastructural system.

TRANSPORTATION

The availability of motorable roads is probably the most important factor determining the distribution of basic

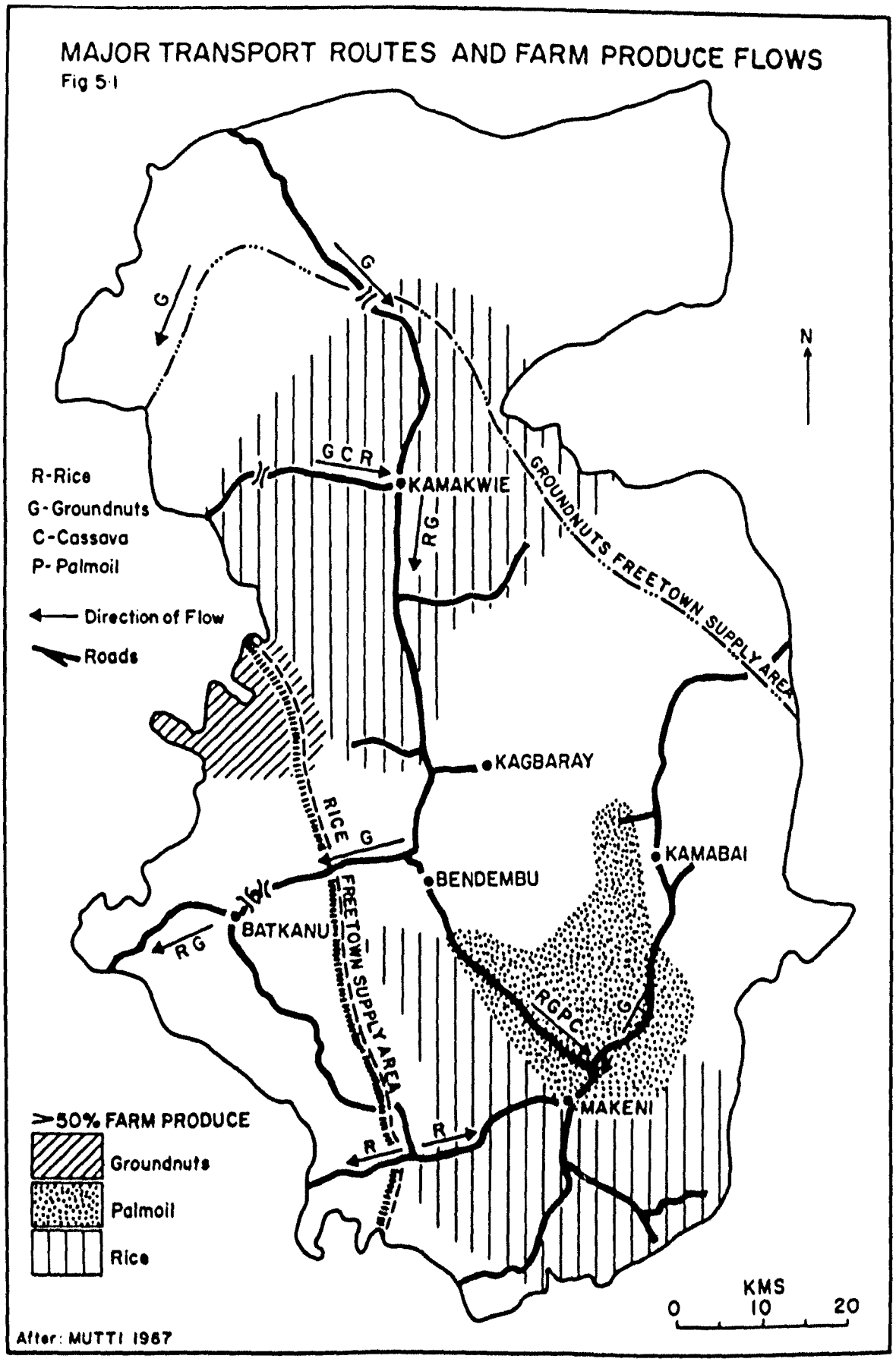
services in Bombali. The problem of linking chiefdom towns by a network of motor roads tends to override physical limitations; so that human and cultural factors are likely to be equally important determinants of the location of basic services. Major motor roads in the district are structured to link district headquarters with most chiefdom towns. Since each district has only one main centre, the transport system is basically an inter-district centre link which is of a higher hierarchy than links within a chiefdom. The problem one faces on road networks relates to a primary stage of rural development in which internal links of hinterlands, the sources of primary production, are yet to be developed.

Human occupance and the ultimate growth of settlement in Bombali have tended to be more closely related to cultural than to economic conditions. An explanation of the pattern of roads in this district should reflect this cultural element if any objective conclusions can be reached. Religion paved the way for administrative organisation in Bombali. Early missionaries instituted schools, health centres and community organisation long before the impact of colonial administration was felt. These early elements of an organised community generated a possible hierarchy between the footpaths linking the locations of missionary activity and other settlements. Later, when the colonial administrator arrived it was probably easier for him to select convenient centres for administrative purposes. At present six of the thirteen chiefdom towns are locations of early

missionary work - Kamabai, Binkolo, Mapaki, Bendembu, Masomgbo, and Kamakwie. Only two chiefdom towns do not have primary schools operated by missionaries, Batkanu and Rogbore.

The study of transport networks in Bombali is probably limited in scope because the linkage of Makeni, the district centre, to other district centres of the country tends to be of greater significance at a national level. However, the importance of Makeni as a nodal point in the national transport system is reduced if there is minimal connectivity with its immediate hinterland. This study is therefore directed towards an explanation of these district centre/hinterland characteristics in transport networks. This in itself is more important in rural development studies where the distance factor can be of tremendous importance in economic productivity. Even in planned socialist economies where the consumption of certain goods is controlled by government, the distance from place of residence to the location of a good is normally of considerable importance. In rural areas of dispersed settlement like Bombali progress in road construction and subsequent service distribution are even more problematic. The present concentration of essential services in chiefdom towns is a most reasonable alternative, especially when confronted with dispersed settlements and limited transportation.

The most efficient means of transportation in Bombali are the dusty motor roads, most of which have not had any


MAJOR TRANSPORT ROUTES AND FARM PRODUCE FLOWS
Fig 5·1
R-Rice
G-Groundnuts
C-Cassava
P-Palmoil
Direction of Flow
Roads
N
KAMAKWIE
KAGBARAY
BENDEMBU
KAMABAI
BATKANU
MAKENI
GROUNDNUTS FREETOWN SUPPLY AREA
RICE
FREETOWN SUPPLY AREA
GCR
RG
RGPC
>50% FARM PRODUCE
Groundnuts
Palmoil
Rice
KMS
0 10 20
After: MUTTI 1967

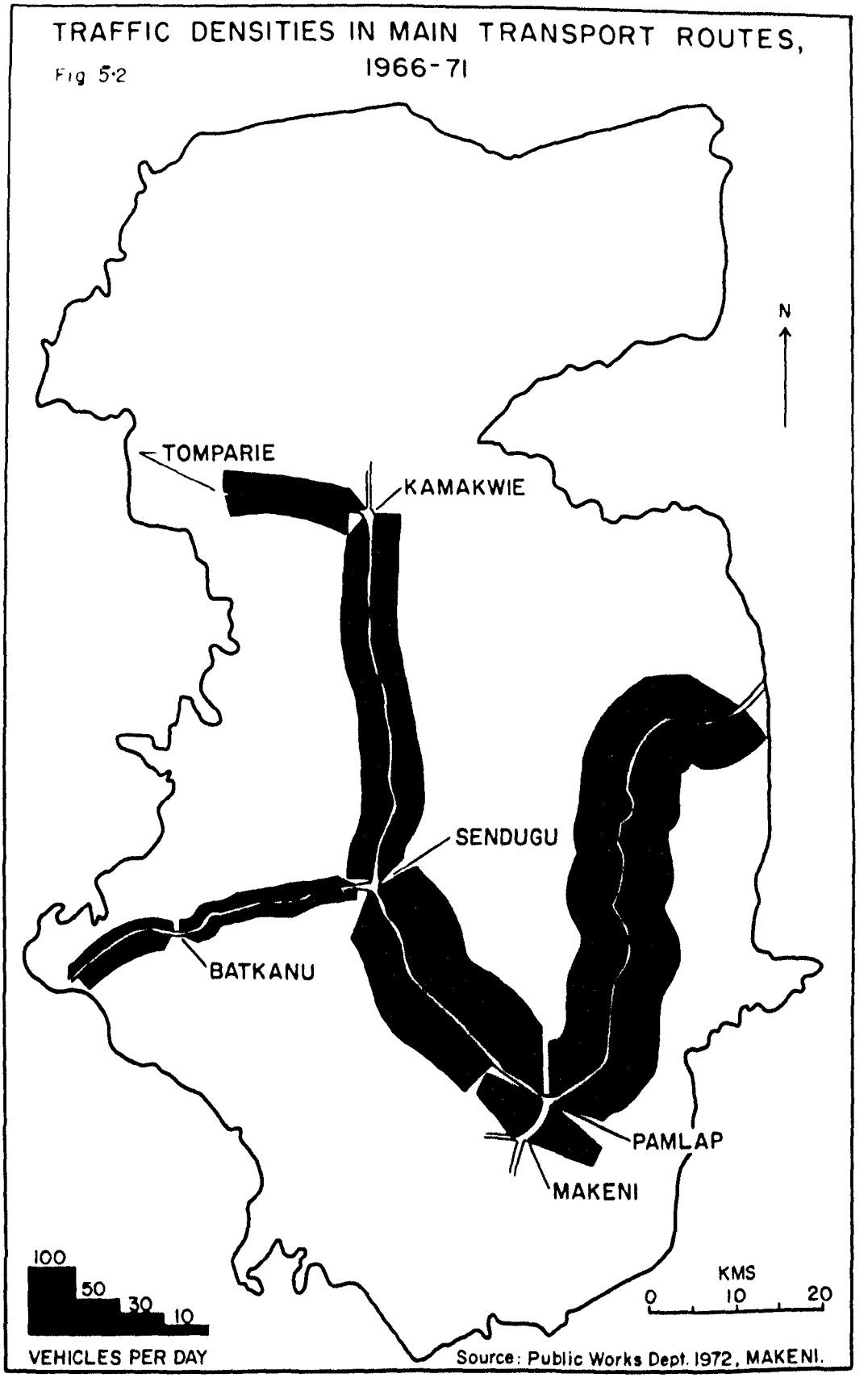
major improvement since their construction. The odd wooden bridge has had to be replaced after an old one is swept off by floods or worn out by heavy trunk traffic. Well graded short distances on these narrow roads are occasional road "luxuries" which are provided when heaps of gravel accumulated on the roads become too deadly for traffic, when the pot-holes become so numerous that speed is reduced to a bare 10 miles per hour, or when muddy conditions do not allow any traffic at all.

The reader is asked to accept that these roads are in fact the all-weather roads that appear in road maps of this part of the country; and one is left to imagine attendant problems of vehicle wear and tear, travelling hazards and travelling times. There are 314 miles of such all-weather roads and 77 miles of seasonal motor roads in the district (Table 5.1). In 1972 a 14 mile stretch of metalled road emerged in the district linking Makeni and Lunsar. This road represents the best improvement in roads since the early '50's.

Most chiefdoms do not have adequate motor roads. Out of 13 chiefdoms only 4 have motorable roads of at least 30 miles' length. Most of the roads tend to cut across chiefdoms to form a simple network (Fig. 5.1) largely depicting Logan's external export oriented system where the regional centre becomes a major node of most transportation routes (1970, 118). An interesting situation in Bombali is that excluding palm kernels there is no other important commodity

Table 5.1 Lengths of motorable roads in Bombali Chiefdoms, 1972

Chiefdom	Area (sq. miles)	All-weather roads (in miles)	Seasonal roads (in miles)
Biriwa	283	40	-
Sebora	97	31	10
Gbanti Kamaranka	148	25	2
Libeisaygahun	147	26	10
Magbaimba	98	5	4
Makari Gbanti	219	38	8
Paki Masabóng	79	10	-
Gowahun	285	29	-
Safroko Limba	149	9	6
Sanda Tenraren	139	25	2
Sanda Lokko	228	17	2
Sella Limba	150	28	13
Tambakha	880	31	14
		314	71


TRAFFIC DENSITIES IN MAIN TRANSPORT ROUTES, 1966-71
Fig 5·2
N
TOMPARIE
KAMAKWIE
SENDUGU
BATKANU
PAMLAP
MAKENI
100
50
30
10
VEHICLES PER DAY
KMS
0
10
20
Source: Public Works Dept. 1972, MAKENI.

for foreign markets. Rather, the district is a source of local surpluses of domestic products like rice, groundnuts, cassava, pineapples and other vegetables with ready internal markets in Freetown (Fig. 5.1). The transportation of cattle from this major source region probably has a higher demand on more efficient communications than all other farm products put together (Clarke, 1966, 83). The supply area of groundnuts for Freetown markets extends to the north-eastern sector of the district. A lot of rice from the bolilands is destined for markets in Freetown, Lunsar and the diamond mines farther south. Makeni, with an urban population of over 12,000 in 1963, absorbs a lot of the more perishable commodities in Bombali. The market for cattle on the other hand tends to be larger than any other single agricultural produce.

Traffic densities on these roads are rather low (Table 5.2); but it is worth noting that 80% of the vehicles braving them are heavy trucks. The two mile distance between Pamlap and Makeni had a mean traffic density of 106 vehicles per day each way between 1966 and 1971 (P.W.D., 1972). The Pamlap/Sendugu road had a northern flow of 66 vehicles and a southbound traffic of 78 per day for the same period (Fig. 5.2). The flow pattern in most northern routes beyond Sendugu are similar to the Pamlap/Kabala route where the volume of traffic tends to be the same in either direction.

The flow pattern has two complications at Pamlap. Vehicles from Guinea and Port Lokko often head for Kabala without

Table 5.2 Mean traffic density on main routes in Bombali, 1966-1971

Route	No. vehicles per day
Port Lokko junction to Batkanu	27
Batkanu to Prt.Lokko Junction	11
Batkanu to Sendugu Junction	14
Sendugu Junction to Batkanu	14
Sendugu Junction to Kamakwie	37
Kamakwie to Sendugu Junction	37
Kamakwie to Tomparie	28
Tomparie to Kamakwie	27
Sendugu Junction to Pamlap	78
Pamlap to Sendugu Junction	66
Pamlap to Kabala	68
Kabala to Pamlap	69
Makeni to Pamlap	106
Pamlap to Makeni	106

Source: Public Works Department, 1972, Makeni.

necessarily reaching Makeni. Within Bombali itself, 10 of the 13 chiefdom towns are north of Pamlap; and these are small staging posts and centres of destination for many passenger vehicles. It so happens that a tribesman driver from a locality is more trusted by his neighbourhood than others, especially for trips involving long journeys to relatives in the big towns. A lorry driver is often prone to wait on his tribesmen passengers for two or three days, knowing full well that when he leaves his chiefdom he is less likely to attract long distance passengers who do not understand his language. Similarly fellow tribesmen can wait for days for the arrival of their truck from places like Bo or Freetown.

A government bus service operates between Freetown, Lunsar and Makeni. This road transport service has only been extended to Binkolo and Masomgbo which are barely seven and five miles from Makeni respectively. The rest of the district has to contend with local drivers who have strong monopolies in their chiefdoms. It is not surprising that the greatest public hazards and problems for the traffic policeman are associated with overloading, and the mixture of goods like bags of palm kernels, rice with sheep, goats, one or two cows and human beings.

Traffic statistics available do not include night travel which accounts for the movement of most contraband goods, illegal movements of Guineans and Sierra Leoneans from one country to the other. Roads beyond Pamlap are little better

than classical pioneer fringe situations where the police are expected to grapple with all sorts of problems ranging from accidents, dangerous driving, licenses and insurance policies to contraband goods and illegal entry into the country. Excluding the police division at Makeni, there are five policemen stationed at Kamakwie and two at Yana. These outpost officers are armed but have no access to police transportation or telecommunication facilities; so that their operations are more or less dependent on the goodwill of local drivers.

TRAVEL TIME AS AN HISTORICAL MODEL IN TRANSPORT INNOVATION

The relationship between settlement growth and the progress in road construction in Bombali is best explained by an historical model in which travel times at specific periods are compared and used as indices of accessibility to settlement locations. The assumptions in such a model are that settlements were already existent at a given period before an innovation - in this case by 1900 - and that the motor road is a transport innovation in Bombali where travel has for long periods been by foot and load porterage by head. Janelle describes this model in his explanation of the dynamics of the settlement-transport complex (1969, 348-68), in which travel time from one place to the other is measured in relation to transport innovations that have taken place within given periods of time. From this model one obtains an average travel time per annum - the time-space convergence rate or the aggregate time-expenditure in

transport required for that place or area to satisfy its operational needs (Janelle, 1969, 349).

In other words, one has a measure of the travel time saved for a given period during which some transportation innovation is generated. A hypothesis here is that settlements tend to increase their interaction and hence, their growth potentials as travel time is minimised. In Bombali this tendency has had moments of increasing and stagnating trends in conformity with the progress in road construction. The present district towns and settlements with a population of about 450 by 1963 are used to exemplify this characteristic.

Distances from one chiefdom town to another are held constant, based on the present road mileage (Table 5.3) and one derives a sum of all distances of other chiefdom towns from a particular town; that is -

$$i = \sum_{1}^{n} d\,(i,j)\ ,$$ where d is the distance

from a chiefdom centre i to j and other (n) centres. This sum of distance value is in fact a crude index of accessibility.

Rogbore, the chiefdom centre for Sanda Tenraren, has the lowest sum of distances to other centres (317miles). Fintonya in Tambakha chiefdom has a value that is more than double that of the most accessible centre (644 miles). Makeni, in

Table 5.3 Road mileage and Chiefdom towns in Bombali (1972)

	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbor	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		13	21	30	44	41	62	86	53	73	82	71	68
Kamakwie	13		8	17	31	28	49	73	40	60	69	58	55
Kamalo	21	8		9	23	20	41	65	32	52	61	50	47
Kamaranka	30	17	9		14	11	32	56	23	43	52	41	38
Kagbaray	44	31	23	14		9	30	54	21	41	50	39	36
Rogbore	41	28	20	11	9		21	45	12	32	41	30	27
Batkanu	62	49	41	32	30	21		60	27	47	56	45	42
Kamabai	86	73	65	56	54	45	60		33	27	36	15	22
Kalangba	53	40	32	23	21	12	27	33		20	29	18	15
Masomgbo	73	60	52	43	41	32	47	27	20		19	12	5
Mapaki	82	69	61	52	50	41	56	36	29	19		21	14
Binkolo	71	58	50	41	39	30	45	15	18	12	21		7
Makeni	68	55	47	38	36	27	42	22	15	5	14	7	
	644	501	429	366	392	317	512	572	323	431	540	407	326

Sebora chiefdom, has the third lowest value (326 miles) and hence third in rank of accessibility. In other words, the district centre is not the most accessible; but Rogbore which ranks first happens to be one of the smallest chiefdom centres, with a population of less than 500 by 1963.

Rates on travel time are assumed for three periods of road development in Bombali - 1900, 1925 and 1955. In 1900 there were no motor roads in the district and since travel was mainly on foot, it is assumed that a man was capable of walking 3·5 miles per hour. By 1925 there were some motorable roads in the district. For example the Makeni/Kabala road had gone beyond Kamabai and 17 miles of the Makeni/Kamakwie road had been completed. The Port Lokko/Batkanu road had reached Mateboi (5 miles). It is estimated that on such roads the average speed was about 25 m.p.h. Major road construction in Bombali had been completed by 1955 and the present network has had little modification since then. By this period speed on those dusty roads was limited to 30 m.p.h.

These speed rates for 1900, 1925 and 1955 are applied to chiefdom town distances to estimate the respective travel times (Tables 5.4, 5.5, 5.6). In 1900 when travel by foot was common, variations in the accessibility of settlements were the same as distance sums (Table 5.3); but in 1925 changes were apparent. There was a general decline of travel time which was further reduced by 1955. For example the

Table 5.4 Travel times for Inter-Chiefdom centres, 1900

	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbore	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		3.71	6.0	8.57	12.57	11.71	17.71	24.57	15.14	20.86	23.43	20.29	19.43
Kamakwie	3.71		2.29	4.86	8.86	8.0	14.0	20.86	11.43	17.14	19.71	16.57	15.71
Kamalo	6.0	2.29		2.57	6.57	5.71	11.71	18.57	9.14	14.86	17.43	14.29	13.43
Kamaranka	8.57	4.86	2.57		4.0	3.14	9.14	16.0	6.57	12.29	14.86	11.71	10.86
Kagbaray	12.57	8.86	6.57	4.0		2.57	8.57	15.43	6.0	11.71	14.29	11.14	10.29
Rogbore	11.71	8.0	5.71	3.14	2.57		6.0	12.86	3.43	9.14	11.71	8.57	7.71
Batkanu	17.71	14.0	11.71	9.14	8.57	6.0		7.14	7.71	13.43	16.0	12.86	12.0
Kamabai	24.57	20.86	18.57	16.0	15.43	12.86	17.14		9.43	7.71	10.29	4.29	6.29
Kalangba	15.14	11.43	9.14	6.57	6.0	3.43	7.71	9.43		5.71	8.29	5.14	4.29
Masomgbo	20.86	17.14	14.86	12.29	11.71	9.14	13.43	7.71	5.71		5.43	3.43	1.43
Mapaki	23.43	19.71	17.43	14.86	14.29	11.71	16.0	10.29	8.29	5.43		6.0	4.0
Binkolo	20.29	16.57	14.29	11.71	11.14	8.57	12.86	4.29	5.14	3.43	6.0		2.0
Makeni	19.43	15.71	13.43	10.86	10.29	7.71	12.0	6.29	4.29	1.43	4.0	2.0	
Total(in hours)	183.99	143.14	122.57	104.57	112.0	90.55	146.27	163.54	92.28	123.14	151.44	116.29	107.44

Table 5.5 Travel times for Inter-Chiefdom centres, 1925

	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbore	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		3.71	6.0	8.57	12.57	11.71	16.49	16.46	15.14	17.17	19.7	15.86	15.74
Kamakwie	3.71		2.29	4.86	8.86	8.0	12.57	12.75	11.43	13.46	16.03	12.15	12.03
Kamalo	6.0	2.29		2.57	6.57	5.71	11.34	10.46	9.14	11.17	13.74	9.86	9.74
Kamaranka	8.57	4.86	2.57		4.0	3.14	7.9	7.89	6.57	8.6	11.17	7.29	7.17
Kagbaray	12.57	8.86	6.57	4.0		2.57	7.34	7.32	6.0	8.03	10.6	6.72	6.6
Rogbore	11.71	8.0	5.71	3.14	2.57		4.77	4.75	3.43	5.46	8.03	4.15	4.03
Batkanu	16.49	12.57	11.34	7.9	7.34	4.77		7.81	6.49	8.51	11.09	7.21	7.09
Kamabai	16.46	12.75	10.46	7.89	7.32	4.75	7.81		1.32	4.03	4.88	0.6	0.88
Kalangba	15.14	11.43	9.14	6.57	6.0	3.43	6.49	1.32		0.8	4.6	0.72	0.6
Masomgbo	17.17	13.46	11.17	8.6	8.03	5.46	8.51	4.03	0.8		5.43	1.7	1.43
Mapaki	19.7	16.03	13.74	11.17	10.6	8.03	11.09	4.88	4.6	5.43		4.28	4.0
Binkolo	15.86	12.15	9.86	7.29	6.72	4.15	7.21	0.6	0.72	1.7	4.28		0.28
Makeni	15.74	12.03	9.74	7.17	6.6	4.03	7.09	0.88	0.6	1.43	4.0	0.28	
Total (in hours)	159.12	118.14	98.59	79.73	87.18	65.75	108.61	79.15	66.24	85.79	113.55	70.82	69.59

Table 5.6 Travel times for Inter-Chiefdom centres, 1955

	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbore	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		0.43	0.7	1.0	1.47	1.37	2.07	2,87	1.77	2.43	2.73	2.37	2.27
Kamakwie	0.43		0.27	0.57	1.03	0.93	1.63	2.43	1.33	2.0	2.3	1.93	1.83
Kamalo	0.7	0.27		0.3	0.77	0.67	1.37	2.17	1.07	1.73	2.03	1.67	1.57
Kamaranka	1.0	0.57	0.3		0.47	0.37	1.07	1.87	0.77	1.43	1.73	1.37	1.27
Kagbaray	1.47	1.03	0.77	0.47		0.3	1.0	1.8	0.7	1.37	1.67	1.3	1.2
Rogbore	1.37	0.93	0.67	0.37	0.3		0.7	1.5	0.4	1.07	1.37	0.1	0.9
Batkanu	2.07	1.63	1.37	1.07	1.0	0.7		2.0	0.9	1.57	1.87	1.5	1.4
Kamabai	2.87	2.43	2.17	1.87	1.8	1.5	2.0		1.1	0.9	1.2	0.5	0.73
Kalangba	1.77	1.33	1.07	0.77	0.7	0.4	0.9	1.1		0.67	0.97	0.6	0.5
Masomgbo	2.43	2.0	1.73	1.43	1.37	1.07	1.57	0.9	0.67		0.63	0.4	0.17
Mapaki	2.73	2.3	2.03	1.73	1.67	1.37	1.87	1.2	0.97	0.63		0.7	0.47
Binkolo	2.37	1.93	1.67	1.37	1.3	0.1	1.5	0.5	0.6	0.4	0.7		0.23
Makeni	2.27	1.83	1.57	1.27	1.2	0.9	1.4	0.73	0.5	0.17	0.47	0.23	
Total (in hours)	21.48	16.68	14.32	12.22	13.08	9.68	17.08	19.07	10.78	14.37	17.67	12.67	12.54

travel time for Rogbore declined from 90·6 hours in 1900 to 9·7 in 1955. That of Fintonya from 184 hours to 21·5.

The centrality of settlement location is of similar consequence to settlement growth especially in unplanned economies where the distribution of larger centres of population is a function of physical and cultural factors. This is clearly illustrated in the first stage of transport innovation (1900-1925) where the time-space convergence rates are highest for Kamabai (211·2), Binkolo (109) Masomgbo (106·6). These are followed by Mapaki (90·9), Makeni (90·9), Batkanu (90·4) and Kamakwie (86·7). Rogbore, which is most accessible with respect to the present transport network has a low value of 59·5 for this period (Table 5.7). Most of the chiefdom towns with higher time-space convergence values are early missionary and administrative centres. It would appear that in Bombali the slightest variations in levels of geographic momentum in settlements tended to increase diversities in rates of population growth.

In the long run more remote centres would have higher convergence values which merely indicates the progress in road construction and inter-settlement connectivity. For example, for the period between 1925 and 1955 (Table 5.8) Fintonya had a time space convergence rate of 275·3, which is double that of Rogbore (112·1) and 1·7 times that of Makeni (114·1). For this whole period of 55 years the rate for Fintonya is about 2·5 times that of Rogbore and Kalangba

Table 5.7 Time space convergence for Chiefdom centres 1900 - 1925

	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbore	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		0.0	0.0	0.0	0.0	0.0	2.93	19.46	0.0	8.86	8.95	10.63	8.86
Kamakwie	0.0		0.0	0.0	0.0	0.0	3.43	28.37	8.9	17.76	8.83	10.61	8.83
Kamalo	0.0	0.0		0.0	0.0	0.0	0.89	19.46	0.0	8.86	8.86	10.63	8.86
Kamaranka	0.0	0.0	0.0		0.0	0.0	2.98	19.46	0.0	8,86	8.86	10.61	8.86
Kagbaray	0.0	0.0	0.0	0.0		0.0	2.95	19.46	0.0	8.83	8.86	10.61	8.86
Rogbore	0.0	0.0	0.0	0.0	0.0		2.95	19.46	0.0	8.83	8.83	10.61	8.83
Batkanu	2.93	3.43	0.89	2.98	2.95	2.95		22.39	2.93	11.81	11.78	13.56	11.78
Kamabai	19.46	28.37	19.46	19.46	19.46	19.46	22.39		19.46	8.83	12.98	8.86	12.98
Kalangba	0.0	8.9	0.0	0.0	0.0	0.0	2.93	19.46		11.78	8.86	10.61	8.86
Masomgbo	8.86	17.76	8.86	8.86	8.83	8.83	11.81	8.83	11.78		0.0	4.15	0.0
Mapaki	8.95	8.83	8.86	8.86	8.86	8.83	11.78	12.98	8.86	0.0		4.13	0.0
Binkolo	10.63	10.61	10.63	10.61	10.61	10.61	13.56	8.86	10.61	4.15	4.13		4.13
Makeni	8.86	8.83	8.86	8.86	8.86	8.83	11.78	12.98	8.86	0.0	0.0	4.13	
Total (in minutes)	59.69	86.73	57.56	59.63	59.57	59.51	90.38	211.17	71.4	106.57	90.94	109.14	90.85

Table 5.8 Time space convergence for Chiefdom centres 1925 - 1955

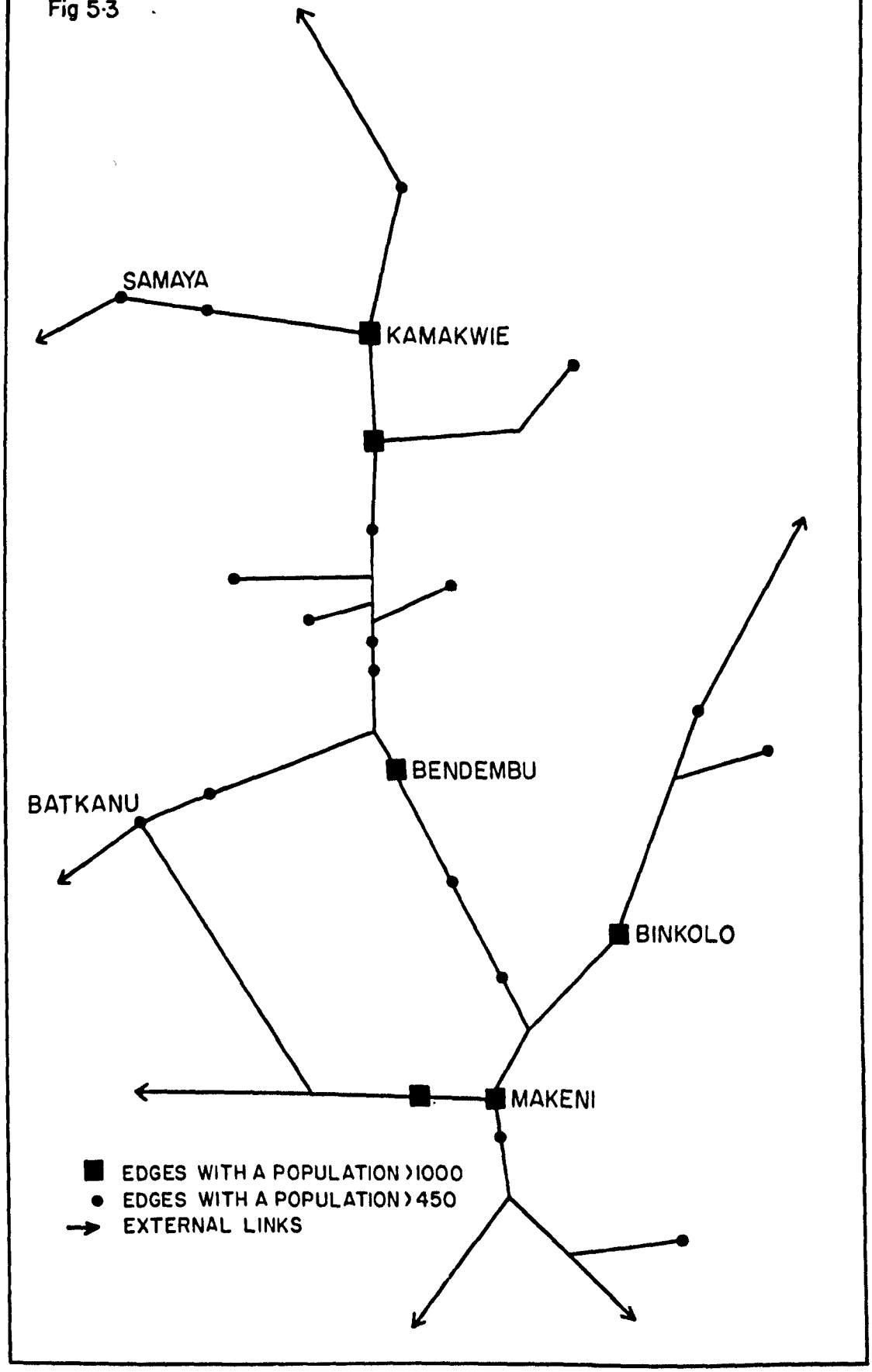
	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbore	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		6.56	10.6	15.14	22.2	20.68	28.84	27.18	26.74	29.48	33.94	26.98	26.94
Kamakwie	6.56		4.04	8.58	15.66	14.14	20.98	20.64	20.2	22.92	27.46	20.44	20.4
Kamalo	10.6	4.04		4.54	11.6	10.08	19.42	16.58	16.14	18.88	23.42	16.38	16.34
Kamaranka	15.14	8.58	4.54		7.06	5.54	13.66	12.04	11.6	14.34	18.88	11.84	11.8
Kagbaray	22.2	15.66	11.6	7.06		4.54	12.68	11.04	10.6	13.32	17.86	10.84	10.8
Rogbore	20.68	14.14	10.08	5.54	4.54		8.14	6.5	6.06	8.78	13.32	8.1	6.26
Batkanu	28.84	20.98	19.42	13.66	12.68	8.14		11.62	11.18	13.88	18.44	11.42	11.38
Kamabai	27.18	20.64	16.58	12.04	11.04	6.5	11.62		0.44	6.26	7.36	0.2	0.3
Kalangba	26.74	20.2	16.14	11.6	10.6	6.06	11.18	0.44		0.26	7.26	0.24	0.2
Masomgbo	29.48	22.92	18.88	14.34	13.32	8.78	13.88	6.26	0.26		9.6	2.6	2.52
Mapaki	33.94	27.46	23.42	18.88	17.86	13.32	18.44	7.36	7.26	9.6		7.16	7.06
Binkolo	26.98	20.44	16.38	11.84	10.84	8.1	11.42	0.2	0.24	2.6	7.16		0.1
Makeni	26.94	20.4	16.34	11.8	10.8	6.26	11.38	0.3	0.2	2.52	7.06	0.1	
Total (in minutes)	275.28	202.02	168.02	135.02	148.2	112.14	181.64	120.16	110.92	142.84	191.76	116.3	114.1

Table 5.9 Time space convergence for Chiefdom centres 1900 - 1955

	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbore	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		3.58	5.78	8.25	12.1	11.27	17.05	23.65	14.57	20.09	22.56	19.53	18.7
Kamakwie	3.58		2.2	4.68	8.53	7.71	13.48	20.09	11.00	16.5	18.98	15.96	15.1
Kamalo	5.78	2.2		2.47	6.32	5.49	11.27	17.88	8.8	14.31	5.89	13.76	12.93
Kamaranka	8.25	4.68	2.47		3.85	3.02	8.8	15.4	6.32	11.84	14.31	11.27	10.4
Kagbaray	12.1	8.53	6.32	3.85		2.47	8.25	14.86	5.78	11.27	13.76	10.73	9.91
Rogbore	11.27	7.71	5.49	3.02	2.47		5.78	12.38	3.33	8.8	11.27	9.23	7.42
Batkanu	17.05	13.48	11.27	8.8	8.25	5.78		16.5	7.42	2.03	15.59	12.38	11.55
Kamabai	23.65	20.09	17.88	15.4	14.86	12.38	16.5		9.08	7.42	9,91	4.13	6.06
Kalangba	14.57	11.0	8.8	6.32	5.78	3.3	7.42	9.08		5.49	7.98	4.95	4.13
Masomgbo	20.09	16.5	14.31	11.84	11.27	8.8	2.03	7.42	5.49		5.23	3.3	1.37
Mapaki	22.56	18.98	5.89	14.31	13.76	11.27	15.59	9.91	7.98	5.23		5.78	3.85
Binkolo	19.53	15.96	13.76	11.27	10.73	9.23	12.38	4.13	4.95	3.3	5.78		1.93
Makeni	18.7	15.1	12.93	10.4	9.91	7.42	11.55	6.06	4.13	1.37	3.85	1.93	
Total (in minutes)	177.13	137.81	107.1	100.61	107.83	88.14	130.1	157.36	88.82	107.65	135.11	112.95	103.35

GRAPHICAL ILLUSTRATION OF THE TRANSPORT NETWORK

Fig 5·3



and double the rates for Kamabai, Kamaranka, Binkolo and Makeni (Table 5.9). For the two periods (1925-1955, 1900-1955), time space convergence values are inversely related to geographic momentum as they decrease with the increasing age of the innovation at the respective settlements.

NETWORK CHARACTERISTICS AND ACCESSIBILITY PATTERNS

The structure of the transport network (see note 5.1) in the district is illustrated by a graphical diagram of major links and edges in the system (Fig. 5.3). There are 24 links and edges in this network. It is thus a simple connected graph of one circuit (Table 5.10) with an $^{e}/_{v}$ ratio of 1·0 and a cyclomatic index (μ) of 1·0. The level of interconnection of various edges within the network is very low. The upper limit of the alpha index (α) for completely interconnected networks is 1·0, but in the Bombali network it is as low as 0·004. The gamma (γ) index for a completely connected network has a value of 100%. In Bombali, this value amounts to 8·7%. The maximum number of edges for the district's transport network is 276. Theoretically its minimum connectivity should be 12·0, the actual value from this network is 11·5.

One is probably dealing with a network of minimal connectivity; but the problem of improving it will largely depend on population sizes at the various vertices. Makeni had a population of over 12,000 in 1963. Kamakwie is about 4,000.

Table 5.10 Structural characteristics of network

Index	Description	Remark
No. of edges / no. of vertices	$\frac{e}{v} = \frac{24}{24} = 1$	simple connected graph.
Cyclomatic number where P= subgraphs	$\mu = e - v + P$ $= 24 - 24 + 1 = 1$	One circuit.
Alpha Index, Degree of Interconnection	$a = \frac{\mu}{\frac{v(v-1)}{2} - (v-1)}$ $= \frac{1}{\frac{24(23)}{2} - 23} = 0.004$	very low compared to upper limit of 1.0.
γ Index	$\gamma = \frac{e}{\frac{v(v-1)}{2}} = \frac{24}{\frac{24(24-1)}{2}}$ $= \frac{24}{276} = .087$ i.e. 8.7%	very low compared to upper limit of 1.0 or 100%.
Maximum Connectivity	$e_{max} = \frac{v(v-1)}{2} = \frac{24(23)}{2}$ $= 276$	
Minimum Connectivity	$e_{min} = \frac{\frac{v(v-1)}{2}}{v-1} = \frac{\frac{24(23)}{2}}{23} = 12$	
Degree of network	$= \frac{\frac{v(v-1)}{2}}{e} = \frac{\frac{24(23)}{2}}{24} = 11.5$	

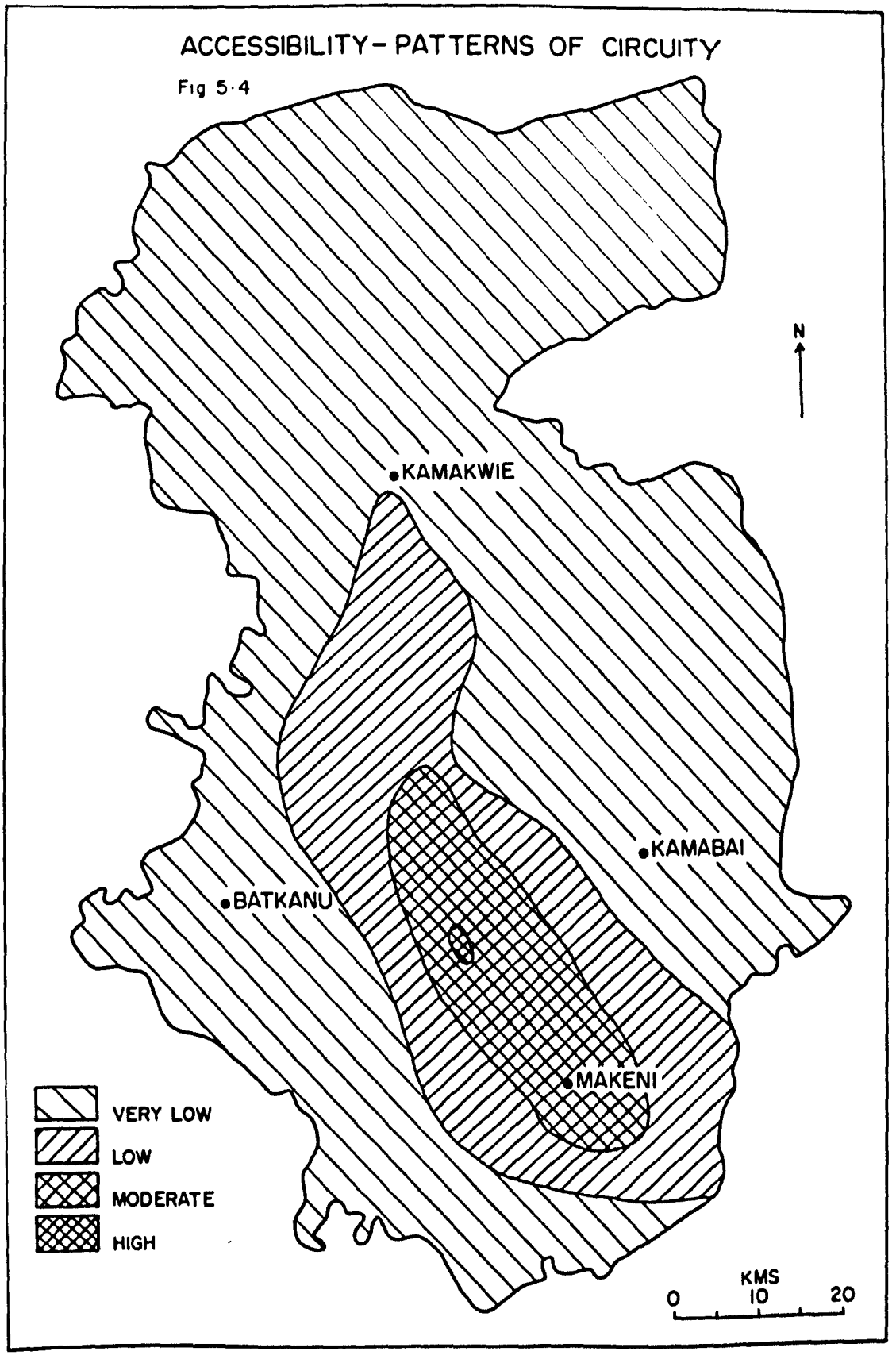
Only four other vertices had a population of over 1,000 by 1963: Binkolo (1,482), Bendembu (1,182) Kamalo (1,122) and Masomgbo (1,038). Three of these are within a radius of 22 miles from Makeni - Bendembu (22 miles), Binkolo (7miles) and Masombgo (5 miles). The other two are over 47 miles from Makeni - Kamalo (48 miles) and Kamakwie (56 miles).

Indices of circuity and accessibility can be derived from variations in lengths of edges (distance) and in the size of population at the vertices. Three indices of accessiblity used in this study are - a) the sum of all distances of other vertices from a given vertex; b) the sum of distance times population at all vertices, that is:

$\sum_{i=1}^{n} d(ip, jp)$, where ip, jp are populations at vertex i and j. These two indices are rather crude measures based on factors of simple relations of distance and population size; c) a third and more interesting index which is the "link demand" (Janelle, 1969) or "intersettlement interaction" (Kolars, 1970) in which the sum of the product of population at a vertex 'i' and all other vertices is divided by the sum of the square of distance separating i from all other vertices:-

$$\sum_{i=j}^{n} \frac{Pi, Pj}{dij^2} .$$

The index of circuity is "used to compare differences between the existing transportation system which contains routes connecting all vertices by the shortest possible path" (Kansky, 1969). This index is shortly stated as:


ACCESSIBILITY- PATTERNS OF CIRCUITY
Fig 5·4
N
KAMAKWIE
KAMABAI
BATKANU
MAKENI
VERY LOW
LOW
MODERATE
HIGH
KMS
0
10
20

$\sum_{i=1}^{n} \frac{(E - D)^2}{V}$, where E is the existing routes in miles, D the length of the shortest possible path; and V the number of vertices. Three levels of analysis have been used in this study - a)the vertex as an individual locational point within the network, b) the chiefdom town as a growth pole within the chiefdom, and c) the chiefdom as a sub-administrative unit within Bombali.

As a measure of accessibility total sums of distances of all vertices from a given vertex barely indicate the most central points within the network. In Bombali this area of greatest accessibility is described by vertices with lowest mileage (Table 5.11) enclosing Rogbore, Rokulan, Bendembu and Rogbin. Next are Kalangba, Kamaranka, Kunsho and Gbanti (Fig. 5.4). The third group encloses Makeni, Kamalo and Makama; the fourth - Binkolo, Mateboi, Kamakwie and Masomgbo. The Kamakwie to Makeni road is evidently most central in the whole network; but this means that Makeni does not have any great advantage of centrality in this network, located 20 miles south of the area of greatest accessibility.

When distance is related to population - $\Sigma d(iP, jP)$ - values tend to decrease with an increase in size of population (Table 5.12). Makeni has an index of 414144 which is trebled by that of Fintonya (1334040). Even where all vertices are analysed it is the centre of greatest population that has the highest index value (Table 5.13). When chiefdom population is used, with chiefdom towns as points of

Table 5.11. Actual Intervertex Sums of Distances. [1]

Vertex.	Sums of distances(miles)
Samaya	1,142
Mabunyele	1,076
Fintonya	1,162
Kamakwie	876
Kamalo	748
Laia	1,012
Kamaranka	642
Gbanti	692
Rogbin	598
Kagbaray	698
Rokulan	562
Rogbore	558
Mateboi	818
Batkanu	928
Bendembu	566
Kamabai	1,120
Bumban	1,098
Kalangba	608
Kunsho	672
Masomgbo	864
Makama	774
Mapaki	1,060
Binkolo	812
Makeni	754

1. See Appendix 5.2.

Table 5.12. Accessibility of Chiefdom Towns : Sums of Distance x Population. [1]

Chiefdom Town.	Accessibility.
Fintonya	1,334,040
Kamakwie	1,040,058
Kamalo	905,315
Kamaranka	781,574
Kagbaray	819,308
Rogbore	644,378
Batkanu	1,027,418
Kamabai	844,806
Kalangba	522,797
Masomgbo	518,273
Mapaki	610,318
Binkolo	,511,191
Makeni	414,144

1. See Appendix 5.3.

Table 5.13. Total vertex accessibility : Sums of Distances of Population x the Population at all vertices.[1]

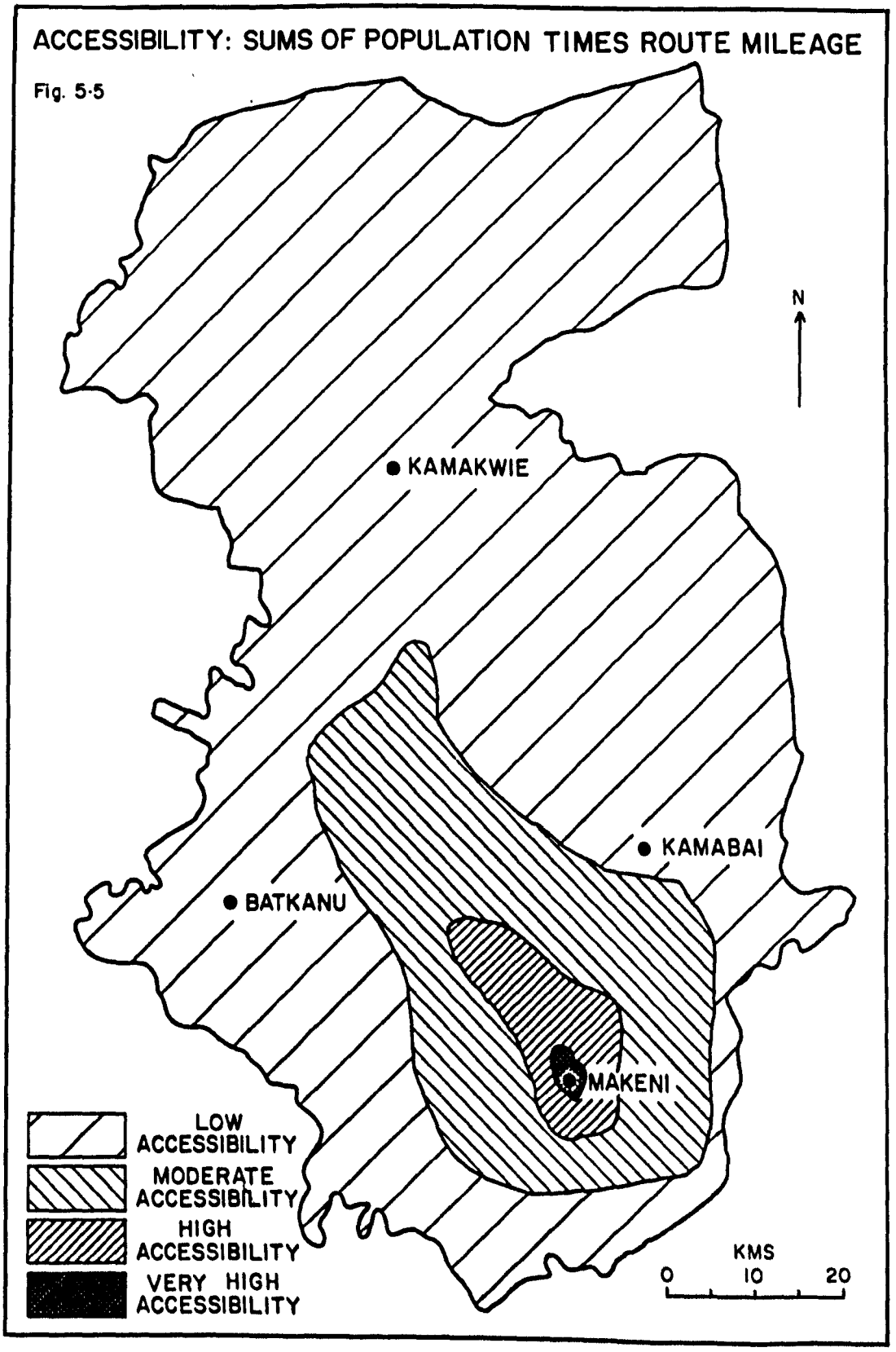
Vertex.	Vertex Accessibility.
Samaya	1,676,855
Mabunyele	1,586,117
Fintonya	1,684,451
Kamakwie	1,292,657
Kamalo	1,123,255
Laia	1,494,343
Kamaranka	961,170
Gbanti	1,011,069
Rogbin	874,215
Kagbaray	1,008,179
Rokulan	813,677
Rogbore	787,625
Mateboi	1,117,847
Batkanu	1,268,347
Bendembu	732,887
Kamabai	1,167,611
Bumban	1,139,617
Kalangba	685,175
Kumsho	643,159
Masomgbo	778,857
Makama	654,095
Mapaki	1,047,293
Binkolo	745,349
Makeni	621,735

1. See Appendix 5.4.

Table 5.14. Total Accessibility of Chiefdom Populations from Chiefdom Towns.[1]

Chiefdom Town.	Total Accessibility.
Fintonya	10,571,410
Kamakwie	7,444,630
Kamalu	7,108,250
Kamaranka	6,058,616
Kagbaray	6,467,512
Rogbore	5,118,736
Batkanu	8,242,804
Kamabai	7,623,558
Kalangba	4,661,344
Masomgbo	5,778,266
Mapaki	7,227,674
Binkolo	5,378,298
Makeni	4,924,865

1. See Appendix 5.5.


ACCESSIBILITY: SUMS OF POPULATION TIMES ROUTE MILEAGE
Fig. 5·5
N
KAMAKWIE
KAMABAI
BATKANU
MAKENI
LOW ACCESSIBILITY
MODERATE ACCESSIBILITY
HIGH ACCESSIBILITY
VERY HIGH ACCESSIBILITY
KMS
0
10
20

origin, Kalangba (Gowahun chiefdom) replaces Makeni (Sebora) as the most accessible (Table 5.14).

Among chiefdom towns therefore, Makeni, the district centre is twice as accessible as Kamakwie or Batkanu, which was a former district centre. The only chiefdom towns with values closer to Makeni are within 15 miles of it - Kalangba, Masomgbo and Binkolo (Fig. 55). The road towards Kamakwie attracts more population and larger settlements.

It is relevant at this point to observe some differences between travel times and present accessibility characteristics of some vertices. While travel time for Kamabai was fifth best in 1925 (Table 5.5), by 1955 it was about the least and next to the remotest chiefdom town of Fintonya (Table 5.6). Kamabai ranks 8th in chiefdom town accessibility (Table 5.12), 17th in all vertex accessibility (Table 5.13), and 11th in chiefdom accessibility (Table 5.14). Makeni and Kamakwie have tended to increase their accessibility even though they are not necessarily located at most central areas. It is probable that basic services and other generators of settlement and population growth have not been directed towards such locations of greater accessibility. It is further probable that settlements like Kamabai, Bumban or Batkanu which had the early advantage of the motor road have not grown fast enough to attract much attention. So that by 1955 when the distance factor in accessibility tended to be more constant than that of

Table 5.15a. Inter-Vertex Desire Lines

	Samaya	Mabunyele	Fintonya	Kamakwie	Kamalo	Laia	Kamaranka	Gbanti	Rogbin	Kagbaray	Rokulan	Rogbore	Mateboi	Batkanu	Bendembu	Kamabai	Bumban	Kalangba	Kunsho	Masongbo	Makama	Mapaki	Binkolo	Makeni
Samaya																								
Mabunyele	2.0																							
Fintonya	15.5	13.5																						
Kamakwie	10.5	8.0	11.5																					
Kamalo	13.0	11.0	18.0	6.5																				
Laia	19.5	16.5	17.0	9.0	8.5																			
Kamaranka	20.0	18.5	26.0	14.5	8.0	12.0																		
Gbanti	21.0	20.0	30.0	18.0	12.0	18.5	6.5																	
Rogbin	25.0	23.5	32.5	20.0	14.0	18.5	6.5	4.0																
Kagbaray	27.0	25.0	31.0	20.0	14.0	14.5	7.0	10.5	7.0															
Rokulan	27.0	25.0	34.0	22.0	16.0	20.0	8.0	6.0	2.0	7.0														
Rogbore	27.5	25.5	34.5	23.0	16.5	20.5	9.0	7.0	2.5	7.5	0.5													
Mateboi	29.5	29.5	41.0	29.0	23.5	30.0	18.0	11.5	12.5	19.0	12.0	11.5												
Batkanu	31.5	31.5	44.0	32.0	26.0	33.0	21.0	14.0	15.0	22.0	15.0	14.0	2.5											
Bendembu	32.0	30.5	39.5	27.5	21.0	24.5	13.5	11.0	7.0	10.0	5.0	5.0	12.0	14.5										
Kamabai	40.0	38.0	41.5	32.0	27.0	24.5	20.0	23.5	19.0	13.0	18.0	18.0	28.0	30.0	16.0									
Bumban	43.0	40.5	43.5	34.5	30.0	26.5	23.5	27.5	23.0	17.0	22.0	22.0	32.0	34.5	20.0	4.0								
Kalangba	38.0	38.5	45.0	33.0	27.0	29.5	19.5	17.5	13.5	14.0	11.5	11.5	16.0	18.0	6.0	15.0	14.5							
Kunsho	44.0	42.5	50.0	39.0	32.0	33.5	24.5	23.5	19.5	18.5	17.5	18.0	22.0	23.0	14.0	14.0	13.0	7.0						
Masongbo	50.0	48.0	56.5	45.0	39.0	40.5	31.0	29.0	25.0	25.5	23.0	23.0	24.5	25.0	18.0	20.0	22.5	12.0	6.5					
Makama	51.0	49.5	57.5	46.0	40.0	41.0	32.0	31.0	26.0	26.0	24.5	24.0	27.5	28.0	19.0	19.0	20.5	15.0	6.5	3.5				
Mapaki	61.0	59.5	57.0	54.5	48.5	48.0	41.0	41.0	36.5	34.0	34.5	34.5	38.5	40.0	30.0	24.0	23.5	23.5	16.5	14.0	11.5			
Binkolo	48.0	43.5	51.5	40.5	35.0	34.5	27.5	28.5	24.0	21.0	22.0	22.0	29.0	31.0	18.0	10.5	11.5	13.0	8.0	11.5	7.5	14.0		
Makeni	50.0	49.0	56.0	45.0	39.0	39.0	31.0	30.0	25.0	25.0	24.0	23.0	27.0	28.0	18.0	17.0	14.0	12.0	6.0	4.0	0.6	12.0	6.0	

Table 5.15b. Squared differences between Actual and Desire Line distances. [1.]

Vertex.	Total.	Network Index (÷ 24)
Samaya	10,071.5	419.65
Mabunyele	9,333.75	388.91
Fintonya	7,534.75	313.95
Kamakwie	5,132.00	213.83
Kamalo	4,072.25	169.68
Laia	11,113.75	463.07
Kamaranka	3,463.00	144.29
Gbanti	4,027.25	167.80
Rogbin	2,856.25	119.01
Kagbaray	5,709.25	237.89
Rokulan	2,314.25	96.43
Rogbore	2,079.75	86.66
Mateboi	4,890.5	203.77
Batkanu	6,751.25	281.30
Bendembu	1,822.50	75.94
Kamabai	21,416.00	892.33
Bumban	17,010.00	708.75
Kalangba	1,696.00	70.67
Kunsho	1,878.50	78.27
Masomgbo	4,190.00	174.58
Makama	1,957.41	81.51
Mapaki	4,565.00	190.21
Binkolo	4,181.25	174.22
Makeni	2,319.16	96.63

The network = 243.73

1. See Appendix 5.6.

Table 5.16. Intervertex Link Demands in Bombali.[1]

Vertex.	Link Demand.
Samaya	36,864.81
Mabunyele	44,376.88
Fintonya	16,477.03
Kamakwie	149,458.13
Kamalo	97,589.06
Laia	12,860.19
Kamaranka	36,237.82
Gbanti	25,297.48
Rogbin	84,421.46
Kagbaray	26,982.04
Rokulan	121,011.38
Rogbore	107,776.76
Mateboi	47,626.11
Batkanu	30,651.19
Bendembu	120,165.50
Kamabai	52,769.09
Bumban	47,347.82
Kalangba	90,343.17
Kunsho	142,002.28
Masomgbo	559,596.86
Makama	9,643,982.37
Mapaki	36,480.39
Binkolo	434,895.29
Makeni	10,799,884.83

1. See Appendix 5.7

population it is the very dynamics of population and settlement growth that now determine accessibility. Areas of low population would tend to be less accessible while those of rapidly growing towns become increasingly accessible.

A further proof of this assumption is observable in the analysis of indices of circuity and demand links in the chiefdom vertices. Actual intervertex distances are shown in Table 5.3, and desire lines or shortest possible intervertex distances in Table 5.15a. Differences in distance between the two are squared (Table 5.15b) and sums of individual vertices are divided by the total number of observations to obtain a circuity value. The index itself decreases with increasing circuity. For the whole network this index of circuity has a value of 243·7. This is a mean value of a network in which 17 of the 24 vertices have lower values. Three chiefdom towns have higher values than the network's mean - Fintonya (313·95), Batkanu (281·3) and Kamabai (892·3). In other words, some vertices which are not chiefdom towns are more favourably located than some of these administrative centres. In fact the vertex with the lowest circuity is Kamabai with a value of 892·3. Makeni comes out well with a value of 96·6; but there are other vertices with greater circuity - Kalangba (70·7), Bendembu (75·9), Makama (81·6) and Rogbore (86·7). Thus Makeni, the major growth pole in the district is less in circuity than a few others, but its population factor reverses this situation in the case of inter-settlement interaction. (Table 5.16).

The link demand for Makeni is highest (10,799,884·8), followed by Makama (9,643,982·4), Masomgbo (559,596·9) and Kamakwie (149,458·1). Masomgbo and Makama are within 5 miles of Makeni and the relatively short distance accounts for the higher values of interaction for these two centres. Kamakwie on the other hand is dependent on its relatively high population even though it is 55 miles from the centre of greatest population concentration.

TRANSPORTATION PROBLEMS

A few problems emerge in this study of motor roads in Bombali. Besides the generally poor conditions of roads there are too few feeder roads for large areas in the district. The hinterlands still have to depend on footpaths and head porterage for most agricultural products reaching chiefdom centres. Consequently food products reaching markets in larger townships are usually those that do not easily rot: rice, palm oil and nuts, dried pepper, kola nuts and groundnuts. Fruits like oranges, bananas, mangoes and tomatoes still have to be provided with improved storage facilities.

Motor transportation itself is still in an early stage of development in Sierra Leone. The Central Statistics Office's survey of means of transportation of agricultural products in Sierra Leone describes nothing short of underdevelopment (Table 5.17). One wonders how agricultural and rural development can be effected without resolving the

Table 5.17 Means of farm produce transportation in Sierra Leone, 1965-1966 (by Province)

Means of Transport	Northern (%)	Southern (%)	Eastern (%)	Sierra Leone (%)
Foot (head load)	61.4	68.8	62.7	64.1
Canoe, boat, launch	16.1	3.1	0.0	7.0
Train	0.5	0.3	0.4	0.2
Lorry	22.0	27.5	36.9	28.4
Bicycle	0.1	0.3	0.0	0.3

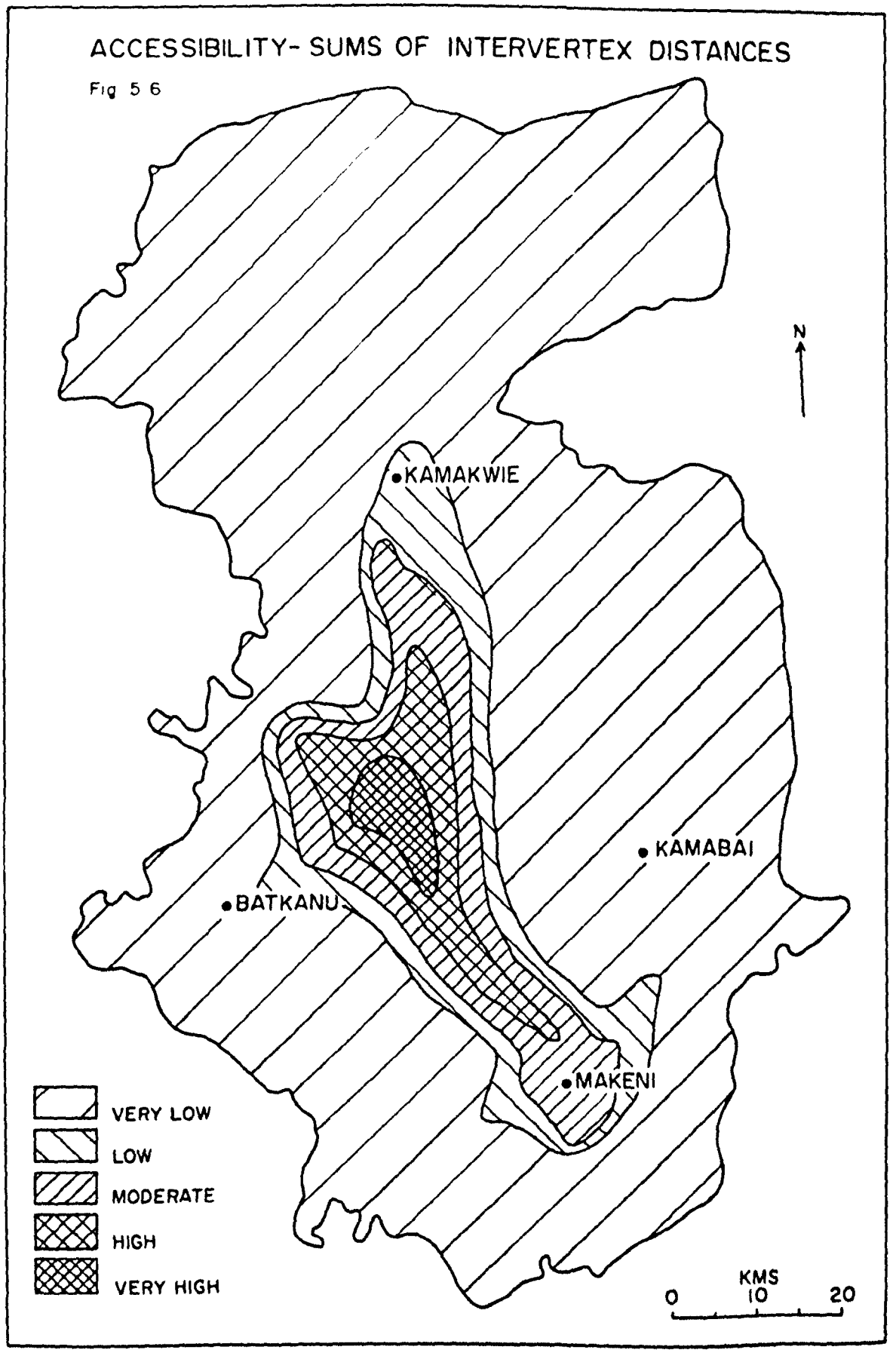
Source: Muthi, 1967 an Abstract from Central Statistics Office

"Agricultural Statistics Survey of Sierra Leone", Table 39, 1966.

pressing need for efficient means of communications. By 1966, 64·1% of all farm produce in the country was most probably transported by head load. In Bombali the percentage was most likely higher because there is little transportation by canoe, boat, launch or train. The lorry which happens to be the most efficient means of communication in the country accounted for only 28·4% of the farm produce transported between 1965 and 66. In the Northern Province this percentage was lower than the national average by 6·4%.

Today the main problems of transportation in the district are structural and economic. The transport network that has evolved is the result of little planning at its inception. There are few alternate routes and the more populated centres continue to grow at the expense of more centrally located villages. There is a low level of complementarity between major roads in the country and district roads in Bombali. The road linking Kabala and Makeni passes through Kamabai and Binkolo which are far south of Bombali. Makeni's link with Lunsar, Freetown and Port Lokko is at the expense of the road from Batkanu.

The road pattern has tended to attract population towards the Makeni/Kamakwie axis and today most of the larger villages are found along this route (Fig. 5.5). The distance factor is an important element in the distribution of centres and this is especially true of a case like Bombali where the largest centre is not centrally located. The result of


ACCESSIBILITY- SUMS OF INTERVERTEX DISTANCES
Fig 5 6
N
KAMAKWIE
KAMABAI
BATKANU
MAKENI
VERY LOW
LOW
MODERATE
HIGH
VERY HIGH
KMS
0
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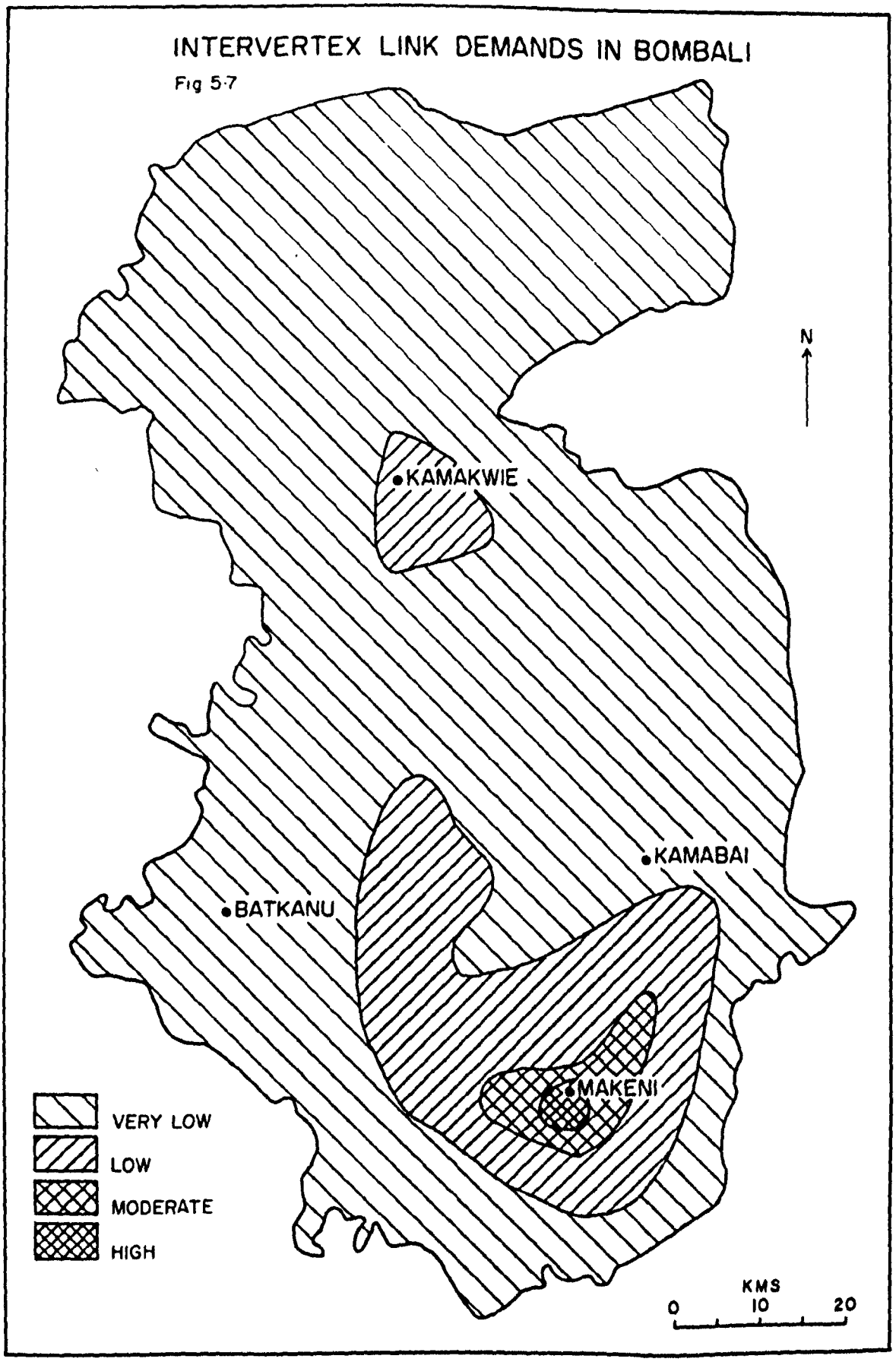
INTERVERTEX LINK DEMANDS IN BOMBALI
Fig 5·7
N
KAMAKWIE
KAMABAI
BATKANU
MAKENI
VERY LOW
LOW
MODERATE
HIGH
KMS
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this situation is a total reduction of the accessibility effect in settlement growth for places more distant from the main administrative centre. In Bombali the zone of greatest accessibility is about 15 miles south of Kamakwie (Fig. 5.4) even though in terms of distance alone this zone extends to about 1 mile from it (Fig. 5.6). Levels of settlement interaction (Fig. 5.7) describe roughly similar patterns as in Figures 5.5 and 5.6, but the population factor in Kamakwie indicates an incipient stage of an important pole of interaction. Beyond 13 miles from Makeni the rest of Bombali suffers from problems of accessibility and this accounts for about four fifths of the district area.

There is at present no mining industry in Bombali; hence this normal index of economic potential from which road construction priorities tend to be based does not favour a short term road development scheme for this part of the country. The problem therefore entails a definition of rural development, because it so happens that while all governments in Sierra Leone place a high priority on agricultural development, it is probably mining and administrative centres that have had greater attention. The greatest testing ground in the process of economic change in the country is perhaps in districts like Bombali where known resources are limited to human beings and agricultural land.

BASIC SERVICES

The limited number of services in Bombali is indicative of an area of immense rural poverty. A survey of service

distribution in the district was carried out by the author, in which settlements with a population of at least 450 by 1963 were studied. There were thirty such settlements, most of which were little more than small villages. One problem experienced in the field concerned the level of contrast between the services in Makeni and those in other settlements. Makeni as a small urban centre is gradually absorbing a host of urban services and can hardly be compared with any other centre in Bombali. As a rapidly growing town there seems to be an immense combination of various functions within single establishments and this creates a problem in the identification of service types. For example, the Lebanese trader is all too often a retailer and wholesaler with no real specialisation in goods. While selling all sorts of merchandise he can be the barber, watch repairer, jeweller, transport agent selling petrol and trucks and operating passenger transport. In settlements of missionary establishments one has partial electricity limited within the confines of mission grounds and operated at the convenience of private owners. This is related to electricity supply for mission high schools, hospitals, residence of missionaries and in some cases, churches. It cannot be said that such settlements have no electricity supply even though only a minor segment of the community has access to it.

SERVICE TYPES

The classification of services in this study entailed a careful generalisation of a host of interrelated activities, most of which are in some early stage of development.

There were about 20 service types identified in the field and these were put into 8 main categories:-

a) Education - primary, secondary, vocational and teacher training colleges;

b) Medical - hospitals, dispensaries, special disease centres like leprosy, and maternity clinic centres;

c) Communications - telephone services and general post offices;

d) Commerce - banking services, retail stores;

e) Administration - the status of centres, types of court services in centres, central government, and chiefdom police establishments;

f) Special government and missionary development services, pipe borne water supply, electricity, agricultural and veterinary services;

g) Recreation - mainly cinema theatres, mobile cinema units and social clubs;

h) Religion.

The assignment of weights or scores for services was a particularly difficult problem partly because of the infant nature of central functions and the fact that the efficiency of a central function in an urban area can hardly be equated to that at a village. The problem was hopefully resolved by an assessment of the sizes of service areas for functions. For example, the district centre has a higher administrative status than any other town in Bombali. A higher weight was assigned to it than all other centres but the

Table 5.18. The Size and Structure of Some Service Areas for Selected Services in Bombali, 1971.

	Chiefdom Courts.			Maternity Clinic Centres					Leprosy		Hospitals and Dispensaries.				Higher Education			Primary Education.				
	Kamalo	Kamakwie.	Pintonya	Makeni	Pintonya	Binkolo	Kamakwie	Bendembu.	Binkolo	Kamakwie.	Makeni	Binkolo	Robaiba	Bendembu	Kamakwie.[1]	Kamabai.[1]	Makeni.[2]	Bendembu	Ghanti	Kamaranka[1]	Matotoka.	Kalangba.
Centre																						
No. of persons served	165	120	194	307	53	67	469	120	238	419	1998	1363	844	283	387	163	84	177	186	167	161	165
%	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Originating from Chiefdom town	14	65	-	290	21	57	187	-	124	78	1791	852	72	3	136	22	22	4	-	78	108	70
%	8.5	54.2	-	94.5	39.62	85.07	39.87	-	52.1	18.62	89.64	62.51	8.53	1.06	35.14	13.5	26.19	-	-	46.71	67.08	42.2
From centre if other than chiefdom town	-	-	-	-	7	-	-	50	-	-	-	-	188	99	-	-	-	138	56	-	-	-
%	-	-	-	-	13.21	-	-	41.67	-	-	-	-	22.27	34.98	-	-	-	77.97	30.11	-	-	-
Chiefdom Location with > 5 persons served	4	1	11	-	-	-	15	3	7	23	8	18	19	15	-	-	-	4	5	4	3	3
No. of persons served	29	5	144	-	-	-	130	17	61	210	107	468	468	108	-	-	-	26	116	26	47	32
%	17.6	4.2	74.2	-	-	-	27.72	14.16	25.6	50.12	5.36	34.34	55.45	38.16	-	-	-	14.69	62.37	15.57	29.1	19.39
Locations out of chiefdom with > 5 persons	2	-	1	-	-	-	3	-	-	-	2	-	3	2	13	7	3	-	-	-	-	2
No. of persons served	12	-	9	-	-	-	19	-	-	-	13	-	50	11	144	94	22	-	-	-	-	10
%	7.3	-	4.6	-	-	-	4.05	-	-	-	0.65	-	5.92	3.89	37.21	57.67	26.19	-	-	-	-	6.06
Other Locations with < 5 persons served	67	34	28	14	17	8	78	44	25	81	63	22	33	26	70	31	33	5	9	39	6	30
No. of persons served	110	50	41	17	18	10	133	53	53	131	87	43	66	62	107	47	40	13	14	63	6	53
%	66.6	41.6	21.1	5.5	33.96	14.93	28.36	44.17	22.27	31.26	4.35	3.15	7.82	21.91	27.65	28.83	47.62	7.34	7.52	37.73	3.73	32.12

1, Secondary School. 2 Teachers' College

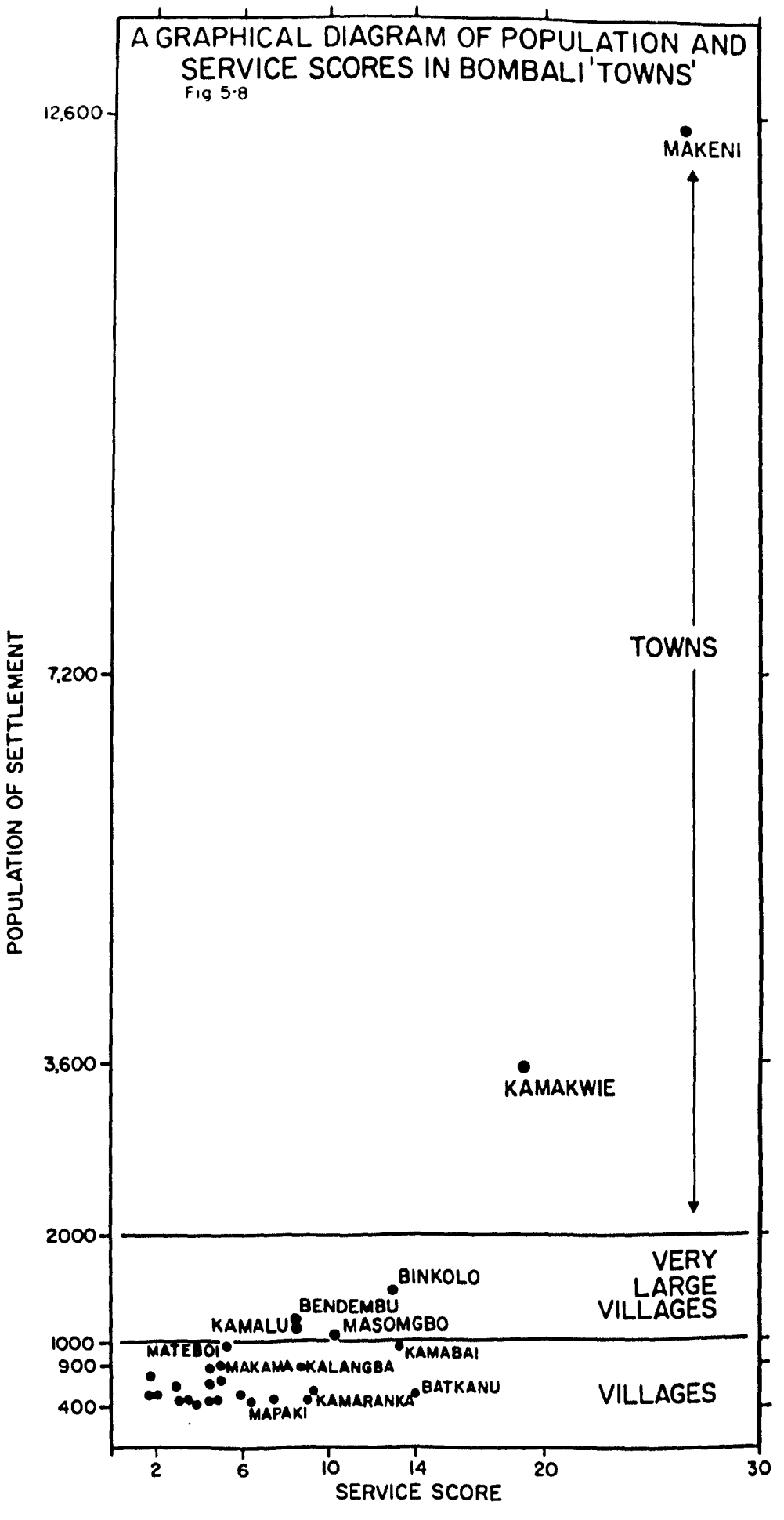
weighting system minimizes its absolute importance (Appendix 5.1). An upper limit of 2·0 was ascribed to any service with the highest service area and there is a gradation to a lower level of 0·25. Two efforts aimed at some objectivity are implicit in this apparently arbitrary system - the occurrence of a service type at a given location is itself important, but limitations imposed by traditional norms, accessibility and poverty limit possible variations in absolute sizes of service areas.

A brief study of service areas for some selected functions (Table 5.18) illustrates the nature of this problem. The number of persons served by individual service types was generally small. Most settlements at which the services were located accounted for the bulk of persons served. Over 40% of primary school children in 5 settlements come from these centres themselves. Excluding courts, there is hardly any other service that has a reasonably wide service area. In 1971, 99% of all attendance at the health centre in Bendembu was by residents of this township. In Makeni, residents accounted for 90% of hospital services, and at the health centre at Binkolo, 66%. Maternity services were equally of limited service areas; the local residents accounting for 94·5% in Makeni, 85·1% in Binkolo, 39·9% in Kamakwie and 39·6% in Fintonya. Services like higher education have wider service areas but there is a generally small size of population served. The teachers' training college at Makeni had only 84 students, 44 of whom come from areas within Bombali. Even in a case like this Makeni accounted for 26% of the total intake (Table 5.18).

SERVICE DISTRIBUTION AND USE

Probably most services are underutilised and one tends to question the need for such establishments. The limited use of services possibly stems from problems of transportation and tradition. The latter is truer with educational and health services. For example, the local peasant still tends to be more confident of his herbs and witch doctor than the modern doctor. As Clarke puts it, the witch doctor is still too powerful (1966, 29). Education is still viewed with some suspicion in many quarters because of the feeling that the educated tend to have little regard for traditional practices. It is as big a threat to the break-up of the extended family as family planning "sermons" from health and social welfare officers. In any case, the peasant will always justly complain that he has no money to send his children to school or pay medical bills from mission or government hospitals.

The more important economic services like banking, commerce, communications, higher education are largely concentrated in Makeni (Appendix 5.1). Because of their administrative status, chiefdom towns are the second most important service locations in Bombali. Here one finds the small missionary dispensary, primary school, chiefdom police station and the weekly mailbag. Makeni has 19 of the 20 services enumerated while Kamakwie has 17. Some chiefdom towns have less than 10 services - Fintonya, Kamaranka, Kalangba and Mapaki have 9 each, Rogbore and Kagbere have 7. Most settle-


A GRAPHICAL DIAGRAM OF POPULATION AND SERVICE SCORES IN BOMBALI 'TOWNS'
Fig 5·8
POPULATION OF SETTLEMENT
12,600
7,200
3,600
2000
1000
900
400
MAKENI
KAMAKWIE
TOWNS
VERY LARGE VILLAGES
VILLAGES
BINKOLO
BENDEMBU
KAMALU
MASOMGBO
MATEBOI
KAMABAI
MAKAMA
KALANGBA
BATKANU
KAMARANKA
MAPAKI
2
6
10
14
20
30
SERVICE SCORE

ments have some measure of administrative status being either sub-chiefdom towns or villages. Religion is common to all centres. Two other services of widespread occurrence are primary schools and wholesale stores. Makeni has a service score of 26·5, Kamakwie 18·75, Binkolo 14·0, Kamabai 13·25, and Masomgbo 10·5 (Appendix 5.1). The rest have scores of less than 10·0. These low service scores for most settlements indicate the essentially rural and poor nature of the district. Of the 30 settlements, only two can be classified as towns (Fig. 5.8); and these are Makeni and Kamakwie. The rest are assorted types of glorified villages which are not yet capable of attracting commerce and other urban functions.

Settlements covered in the survey were grouped by chiefdoms to estimate total chiefdom service scores (Table 5.19). Administration and religion have the biggest proportion of service scores in the district with percentage scores of 27 and 23 respectively. In other words 50% of all services in Bombali are connected with administration and religion. Education is next with 14·1% followed by medical services with 11·3%. Commerce, communications, agriculture, electricity and other elements in economic development have scores of under 10%.

Sebora chiefdom alone accounts for 25% of services like posts and telecommunications, commerce and banks, government and misionary development services. Chiefdoms like Magbaimba, Tambakha, Sanda Lokko and Gbanti Kamaranka do

Table 5.19 Chiefdom service scores

Service group	Biriwa	Sebora	Gbanti Kamaranka	Libeisaygahun	Magbaimba	Makari Gbanti	Paki Masabong	Gowahun	Safroko Limba	Sanda Tenraren	Sanda Lokko	Sella Limba	Tambakha	Total	%
A.	3.0	5.5	2.0	2.0	1.0	3.0	1.0	2.0	1.0	3.0	2.0	3.25	2.0	30.75	14.06
B.	2.0	3.0	1.0	2.0	0.0	3.0	1.0	3.0	3.0	1.75	1.0	4.0	0.0	24.75	11.31
C.	1.0	3.5	0.75	1.0	0.0	1.25	0.5	1.0	1.0	1.25	0.5	1.0	0.25	13.0	5.94
D.	2.0	5.0	1.25	1.0	0.25	1.5	0.5	2.5	1.5	1.25	1.25	2.25	0.5	20.75	9.49
E.	4.5	7.5	4.25	3.5	3.0	6.0	3.5	5.0	4.5	5.0	4.0	4.25	4.0	59.0	26.97
F.	0.75	4.0	0.0	2.0	0.0	0.0	0.0	0.5	1.0	2.0	0.0	3.0	0.5	13.75	6.29
G.	0.5	1.0	0.5	0.5	0.25	0.5	0.5	1.0	0.5	0.25	0.5	0.5	0.25	6.75	3.09
H.	4.0	5.0	3.0	2.0	2.0	8.0	2.0	5.0	4.0	5.0	4.0	4.0	2.0	50.0	22.86
Total	17.75	34.5	12.75	14.0	6.75	23.25	9.0	20.0	16.5	19.5	13.25	22.25	9.5	218.75	

not have any health centres, let alone treated drinking water. On the other hand Sella Limba and Sebora chiefdoms together account for about 20% of the educational services, 32% of the health services, over 33% of the commercial services and about 50% of the government and missionary development services. The unevenness of service distribution is apparent even at the chiefdom level; but it must be remembered that the larger administrative towns or villages account for the majority of service locations in Bombali. These administrative centres are therefore small growth poles or at least points of service concentration in the district.

SERVICE DISTRIBUTION AGENCIES

Three main public sectors tend to be responsible for the pattern of service distribution in Bombali - the government or administrative sector, missionary agencies and foreign businessmen. Of these three, missionary activity is probably the most important. The educational service sector is mainly a religious operation. Out of about 65 primary schools in Bombali, 1971, 6 were under district council supervision, 55 were catholic and Wesleyan Methodist (Table 5.20). The government technical school at Batkanu is the only one of its kind in the district. The only teachers' college is under the Catholic mission. There are five secondary schools, two are Catholic and three are Wesleyan Methodist.

Impressive though missionary efforts at mass education may seem, there is a preponderance of illiteracy in Bombali

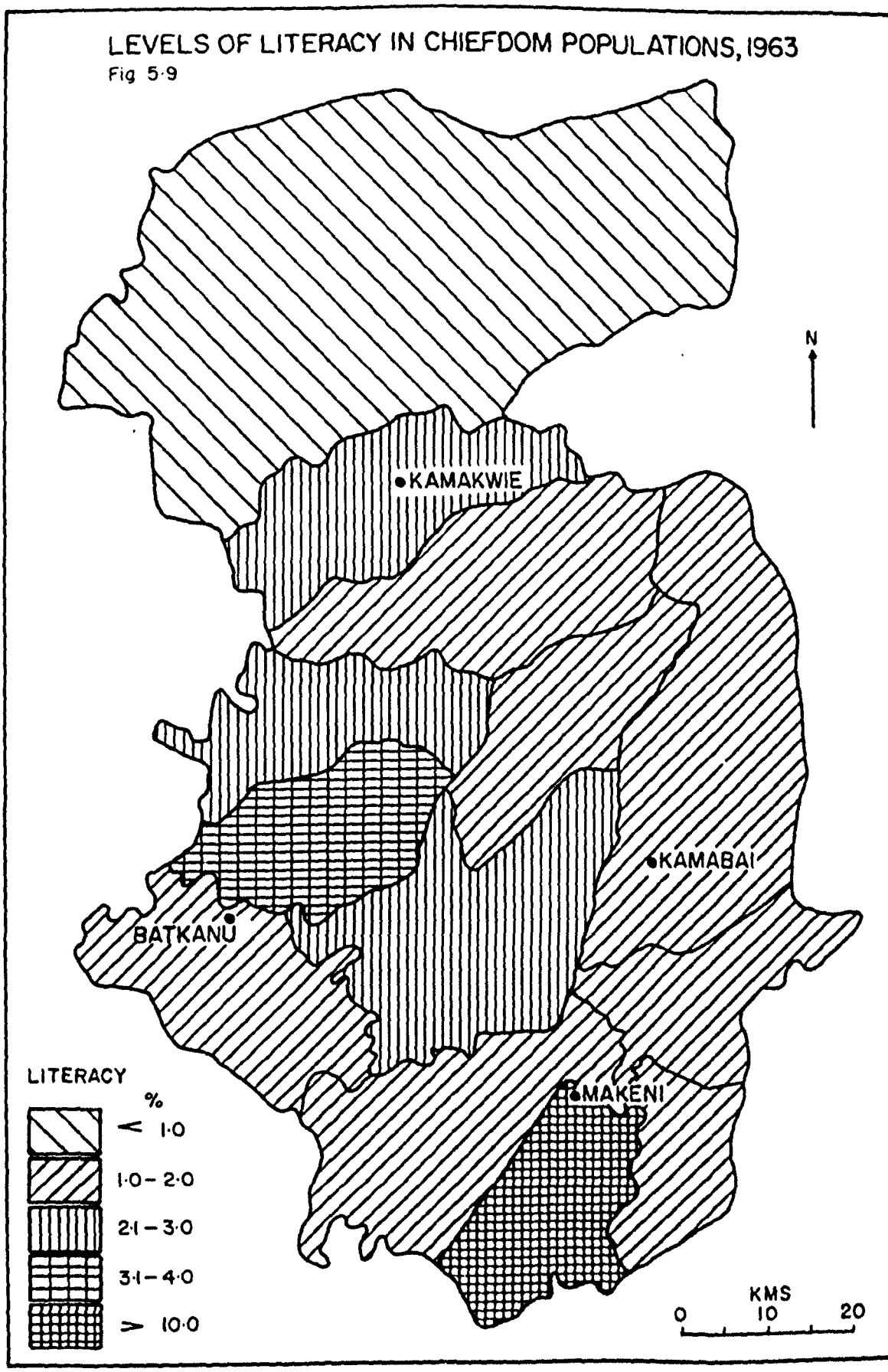
Table 5.20 The distribution of Educational Institutions, 1972 (by Educational Authority)

Educational Authority	Primary	Vocational		Teachers' College	Secondary
		Technical	Religious		
Central Government	-	1	-	-	-
District Council	6	-	-	-	-
Wesleyan Church	27	-	1	-	3
Roman Catholic	28	-	-	1	2
Others	4	-	-	-	-
Total	65	1	1	1	5

Table 5.21 Literacy in English of population 10 years and over, 1963

Chiefdom	Total	%	Male	Female
Biriwa	275	1.7	225	50
Sebora	1,605	11.2	1,113	492
Gbanti Kamaranka	183	2.1	132	51
Libeisaygahun	84	1.4	71	13
Magbaimba	61	1.5	53	8
Makari Gbanti	244	1.9	193	51
Paki Masabong	139	1.9	111	28
Gowahun	301	2.1	225	76
Safroko Limba	156	1.4	118	38
Sanda Tenraren	292	3.7	204	88
Sanda Lokko	105	1.3	88	17
Sella Limba	294	2.5	231	63
Tambakha	43	0.6	39	4

Source: Central Statistics Office, 1964, Census of Sierra Leone, Freetown.


LEVELS OF LITERACY IN CHIEFDOM POPULATIONS, 1963
Fig 5·9
N
KAMAKWIE
KAMABAI
BATKANU
MAKENI
LITERACY
%
< 1·0
1·0 – 2·0
2·1 – 3·0
3·1 – 4·0
> 10·0
KMS
0
10
20


THE DISTRIBUTION OF EDUCATIONAL INSTITUTIONS IN BOMBALI 1972
Fig. 5·10
FINTONYA
N
SAMAYA
MABUNYELE
KAMAKWIE
MADINA
LAIA
KAMALO
MAHAIRIBO
MALIKIA
KUMBU
MAKASSA
MAKULON
KAMARANKA
MAKARANKI
MAKOMRAY
GBANTI
ROYEMA
ROGBIN
KAGBARAY
MANJORO
ROKULAN
YONGARO
MAMBALA
KAMABAI
KOTOHUN
BUMBAN
MATEBOI
BENDEMBU
BUMBANDE
BATKANU
KAGBANE
KALANGBA
MAMAKA
MASOMGBO
BINKOLO
KUNSHO
KEREFE
MAKENI
MAKARI
KATHANTHA
MASOMGBO
MAKAMA
PETBANA
MAPAKI
MAYAGBA
KONTHA
Primary
Secondary
Vocational
Teachers' College
KMS
0
10
20

(Table 5.21). Only 1·9% of the district population aged 10 or over was literate in English by 1963. Six chiefdoms had a lower average - Tambakha (0·6%), Sanda Lokko (1·3), Safroko Limba (1·4), Libeisaygahun (1·4), Magbaimba (1·5) and Biriwa (1·7). The male population accounted for 74·1% of this literate sector. The chiefdom with the highest percentage of literacy was Sebora (11·2), but Makeni alone has over 50% of the total chiefdom population.

The situation is hopefully changing since 1963 because of the increase in primary schools. The pattern of literacy in the district in 1963 placed Sanda Tenraren ahead of Sella Limba chiefdom (Fig. 5.9), this is most likely a result of the more rational distribution of primary schools in Sanda Tenraren (Fig. 5.10). Tambakha chiefdom is likely to have the least percentage of literacy for a long time, followed by Libeisaygahun and Safroko Limba. One obstacle to the speed of mass literacy is the fact that like most essential services more schools are located in chiefdom towns than all other villages put together (Table 5.22). For example, in Sebora chiefdom 12 of the 16 primary schools are at Makeni. In Sella Limba 4 of the 6 primary schools are at Kamakwie.

During the past eight years the government succeeded in providing treated pipe borne water for four settlements - Makeni, Kamakwie, Batkanu and Mateboi. All other settlements depend on wells and streams for drinking water. There

Table 5.22 The distribution of Educational Institutions at Chiefdom towns, 1972

Chiefdom	Total	At Chiefdom Town	%	Other centres	%
Biriwa	8	3	37.5	5	62.5
Sebora	16	12	75.0	4	25.0
Gbanti Kamaranka	8	1	12.5	7	87.5
Libeisaygahun	2	2	100.0	-	-
Magbaimba	2	1	50.0	1	50.0
Makari Gbanti	5	2	40.0	3	60.0
Paki Masabong	4	2	50.0	2	50.0
Gowahun	8	2	25.0	6	75.0
Safroko Limba	2	1	50.0	1	50.0
Sanda Tenraren	4	-	-	4	100.0
Sanda Lokko	6	1	16.7	5	83.3
Sella Limba	6	4	66.7	2	33.3
Tambakha	2	1	50.0	1	50.0


THE DISTRIBUTION OF SOME SERVICES IN BOMBALI 1972
Fig 5·11
M YANA
N
A SAMAYA
M A V
L
T
KAMAKWIE
M KAMALO
M KAMARANKA
M ROGBIN
ROKULAN
KAMABAI
V M
M
BENDEMBU
T MATEBOI
A M
T
BATKANU
KAGBANE
M KALANGBA
BINKOLO
L M
KUNSHO M
T A V MAKENI
M
MASOMGBO
M
MAPAKI M
KMS
0 10 20
A Agricultural Post
L Leprosy Clinic
M Maternity Clinic
T Treated Pipe Water
V Veterinary Post
Government Dispensary
Private Dispensary
Mission Dispensary
Government Hospital
Mission Hospital
Private Electricity
Government Electricity

are two hospitals in the district. In good times each of these hospitals is manned by two medical doctors. With a district population of 198,726 in 1963 the number of persons per doctor was 49,681, a figure over three times higher than the national average, 14,800 for the same period (Clarke, 1966, 29). Much responsibility for the provision of health services has been born by missionary agencies (Fig. 5.11) who operate one of the two hospitals and three of the seven dispensaries. The Catholics have a dispensary at Masomgbo, the American Wesleyan Methodists are in charge of those at Kamabai and Bendembu. Kagbane and Rokulan dispensaries were built by local individuals who later asked the district council to man them with dispensers and medical supplies. Binkolo and Batkanu are old established government dispensaries. One great improvement in the health sector is the establishment of maternity clinics and centres in Bombali. Today there are 14 maternity centres manned by local midwives who have the advantage of speaking the tribal languages (Fig. 5.11). Leprosy is treated in two main centres - Kamakwie and Binkolo. There is a fairly widespread occurrence of this disease, but efforts are being made by mission health officers to reach remote villages.

For most settlements in Bombali firewood and kerosene are the main sources of fuel. Makeni is the only town provided with electricity by the government controlled electricity corporation. In settlements like Kamakwie, Kamabai, Bendembu Masomgbo and Binkolo, missionaries have small electric generating plants mainly for their establishments. The lack

of electricity supply for most settlements is a severe limitation to the introduction of multiple services which are dependent on electrical power. It is also the most attractive factor in modern living. The progressive businessman is usually reluctant to establish his operations in places where this source of fuel has not yet become a common domestic commodity.

One advantage in Bombali is that development is probably moving at a similar rate to most other districts in the north. Future changes in the infrastructure cannot easily be disturbed by the inertia of settlements with faster growth rates. One however still regrets the lack of any serious effort at planning for development at all levels in the country. For example it is difficult to explain why treated water for certain townships comes from 7 miles away and yet larger villages within that radius are not provided in the same way, or why primary educational establishments continue to be instituted at townships at the expense of the hinterland which needs schools most.

Note 5.1

Kansky's study of transport networks (1963) remains one of the most straightforward explanations of transportation in quantitative geography. The nature of transportation routes in Bombali has been described by use of his indices together with those of workers like Janelle and Haggett. The special advantage of Kansky's explanation probably rests upon its global applicability, while Janelle's model of transport innovation needed only minor modifications to fit conditions in Bombali. For example measures of time-space convergence were fitted later in a matrix with other variables in an attempt to describe patterns of underdevelopment in the district (Chapter vi).

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CHAPTER VI

PATTERNS OF UNDERDEVELOPMENT IN BOMBALI

INTRODUCTION

Chiefdoms as administrative areas in Bombali are sub-regional units containing a variety of peasant economies which have minimal external trade. Conditions for development in such economies have been discussed by several scholars in this field - Logan, 1970; Church, 1969; Dickson, 1968; Clarke, 1966 . The main limitations to conclusive and objective decisions on regional planning for development probably stem from the paucity of detailed local studies at levels as small as chiefdoms. Conclusions reached by most workers in development studies and related fields tend to be of a general nature; but it is important to note that such studies serve a vital role of indicating important characteristics that obtain in such regions.

Logan, for example, desribes a development model dominated by small-scale peasant farmers in which some regional centres prosper from the trading services they perform for the rural areas (118). For him, these regional centres are small growth poles; and for benefits of growth to spread outwards, the peripheral areas have to be more thoroughly integrated with the centres (119). In this first study of a Nigerian example, Logan was probably impressed by a basic problem of the tremendous contrast between the town and the village, patterns of service distribution and access to such services from more remote areas. Clarke and others outline a similar situation in Sierra Leone (1966).

In a later study, however, Logan concluded:

> ..."the effectiveness of the organisational structures is probably the most critical variable in the whole development process." (1972, 244).

Earlier studies in aspects of underdevelopment have tended to transcend this stage of investigation; but at the same time presenting a fairly accurate description of objectives for development. For example, Church and Dickson stress the human element in these economic systems. The recommendations of scholars of this stature in West African Development studies are worth mention in this context. For Church:

> "Realistic aid and true development of state and nation, of the town and countryside, is by helping people to help themselves, from the villages upwards and outwards, and especially in the transition from country to town," (1969, 62).

Dickson, in his study of economic development in Northern Ghana (1968) observes that not much improvement can be expected from a population living at subsistence level and obliged, because of the rudimentary techniques in use, to devote nearly all its energy to the basic task of food production (696). Both Dickson and Church have much regard for the role of traditional rural man in development - problems connected with local traditions, mass communication in multi-tribal areas.

There are certainly no short term solutions to problems involving human attitudes in traditional society, no matter

how these problems are approached. When Sierra Leone became independent, substantial economic development was envisaged. Achievements have tended to fall short of expectation because of a) political instability, b) lack of indigenous expertise, and c) government emphasis on increasing agricultural output without changes in infrastructure required to achieve greater agricultural production and rural development.

Clarke's conclusion on development trends for Sierra Leone is rather plausible:

> "We are likely to witness profound changes in future decades partly because the independent government of Sierra Leone views its country through different eyes... the accent is on development more than export ..." (1966, 113).

There is hardly any contention that, as Clarke observes, the north has suffered from insufficient attention and is consequently least developed (113); but the changes hoped for may not have been as rapid as they should be. As in colonial times, Sierra Leone is still concentrating on increased primary production to improve a relatively unstable economy. From the study of Bombali it is apparent that the structural framework for increased productivity is weak and the local variations one has to contend with are immense.

Individual case studies of underdevelopment vary in depth of information and can be of limited applicability.

These variations somehow reflect the multiplicity of tribal worlds in this part of the globe, let alone physical, cultural and environmental differences. The study of Bombali is no exception to such limitations - even at an inter-district level within Sierra Leone. The relatively small size of the study area, however, provides the advantage of examining and determining more relevant aspects of underdevelopment. Moreover, it has been possible to describe patterns of underdevelopment and probable priority areas for development within the district.

VARIABLES

The study of patterns of underdevelopment is based on 49 variables (Appendix 6.1) some of which are conventional measures of regional characteristics. It is difficult to group these variables into rigid categories simply because of their broad similarity. However, 25 of them are probably economic, 14 are human and 10 are physical characteristics. Variables related to structural and physical characteristics include chiefdom areas, land over 500 feet, land under 200 feet (lowland) and land between 200 and 500 feet above sea level (upland). Indices of chiefdom shapes discussed in Chapter 4 are also included - $\bar{d}_r / \bar{d}_A$, $\bar{d}_A / \bar{d}_p$, r_I/r_E and the boundary length of a chiefdom divided by its area.

Human characteristics involve measures of crude activity rates by chiefdom and by sex, literacy in English of the population aged 10 years and over, the number of settlements with a population of over 500, by chiefdom; and the agri-

cultural population in 1963. Other indices include service scores for religious and administrative services, the population of chiefdom towns in 1963, densities of population in two one-mile radii from chiefdom town centres. Other variables are mainly economic and related to services, intervertex travel times, motorable route mileage, measures of circuity, accessibility and intersettlement interaction (link demands).

It is noticeable from this list (Appendix 6.1) that some common measures of economic and physical characteristics are omitted. For example, one thinks of aspects like per capita income, variations in climate, land potential, demographic growth trends and migration. The omission of these characteristics is partly due to minimal reliability of data; but even more because of the sparseness of variability at this level. Certain variables in the matrix are closely related to characteristics for which no accurate data exist. Such variables have been used to describe the latter. For example, the height differential is a fairly reliable index of peasant farm regions. Most swamp land areas in the district are below 200 feet - the swamp rice regions. Upland farming is between 200 and 500 feet, above which hilly conditions limit constant cultivation.

Income differences are minimal among peasantry, and in Bombali, areas of possible variations are related to size of settlement. For example, the income level for Makeni may be higher than Kamakwie, but these are the only two

settlements with a population of over 2,000. Even in this case, higher incomes are mainly indicative of higher costs of living, a greater possibility for earning and spending wages rather than a capital saving index. The variation of service scores in settlements is probably most representative of this characteristic. The variables selected were therefore a deliberate effort to analyse characteristics which can produce greatest sub-regional variability.

Logan seems more conclusive about the approach to development studies of this nature:

> "Probably the greatest need in regional planning in developing countries is temporarily to divert attention away from spatial structures to a systematic study of organisational systems that bind together people and economic activities."(244).

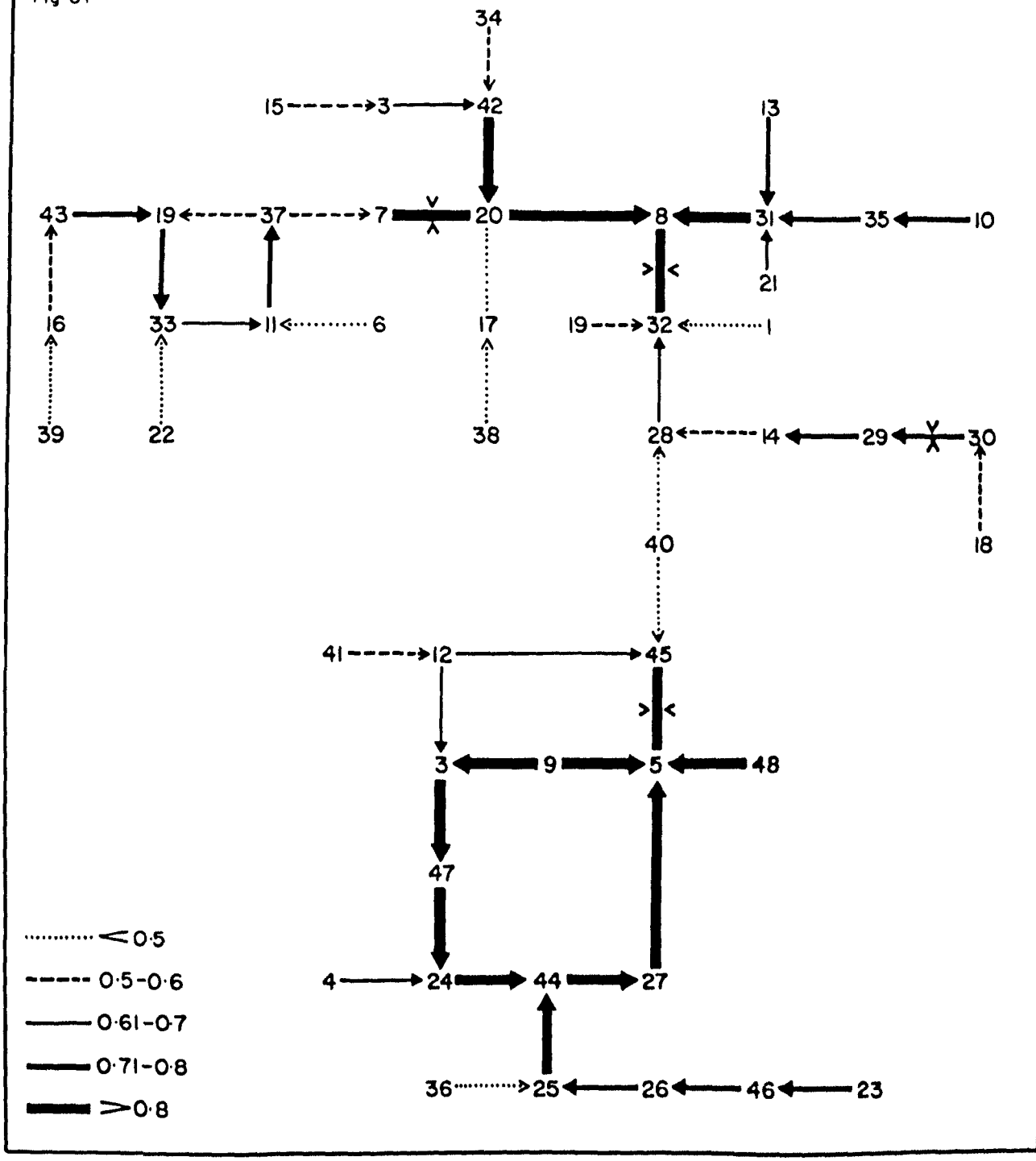
This 'need' seems to be appropriate especially if one accepts that for constructive development the present patterns of rural economies and infrastructures must be the basis for innovation. It must, however, be remembered that development is at various rather than even stages in most developing countries, and it is difficult to determine methods of study.

ANALYSIS OF CORRELATIONS

A Spearman rank correlation matrix was derived from the 49 variables (Appendix 6.2) and a value of 0·500 is considered significant at a 5% level of confidence. Only 12 variables have between 21 and 30 correlations above 0·5, 22 have

THE RELATIONSHIP OF VARIABLES AT 6th HIGHEST CORRELATION

Fig 6·1



significant correlations between 11 and 20, while 13 have between 1 and 10. One variable, the percentage of the dominant tribe in the chiefdom, has fairly low correlations, none of which reaches a 0·5 level. Variables like religion, administration, posts and telecommunications, literacy and commerce have at least 25 significant relationships with others. These are measures of human and economic characteristics. Measures of shape and forms of administrative areas have few significant correlations.

Interest cannot, however, be limited to relationships that are significant, because it is evident from the correlation matrix that variables of lower scores have some weight. An attempt was made to rank individual variables by size of correlation, to determine the level at which all of them are linked. A linkage of this nature tends to describe the nature of relationships under study. The variables are completely interconnected at the sixth highest correlation (Appendix 6.3).

A diagrammatic representation of this interconnection shows that variables tend to be divided into two main groups by variable 40, the mean distance of chiefdom area from the administrative centre ($\bar{d}_A$). From Figure 6.1 and Appendix 6.3 variable 40 is negatively correlated with most measures of accessibility, crude activity rates and literacy in English ($r = -0{\cdot}368$) and positively correlated with all other variables ($r = 0{\cdot}368$). Characteristics with low correlations and weak relationships tend to occupy

fringe locations in the diagram and it is possible to describe sets and sub-sets of correlation clusters.

A major characteristic underlying these associations is probably the relationship between the administrative or growth centre and its hinterland. While on one hand there can be a closer association of growth forces within certain locations in administrative areas, such an association contends with problems of access, economic activity and, in this case, literacy. These negative forces are of an historical nature and tend to be closely linked. The upper part of the diagram largely depicts functional elements of economic growth operating within this set of problems. It is possible to identify 3 sub-sets of elements in this portion of the diagram. Variable 7, the link demand of chiefdom towns with respect to all vertices in the transport network, contains one sub-set. Variable 8, the total link demand for chiefdom vertices, contains a second, while the third subset is centred on variable 32, the total chiefdom score on administrative services.

The close association of motorable route mileage and educational services to administration is probably a function of accessibility. The close relationship of variable 18 (upland area 200-500 feet) and 30 (telecommunications and posts), 29 (medical services) , 14 (the chiefdom agricultural population) and 28 (educational services), puts emphasis on the predominantly rural nature of the environment in which these services operate. Variable 8 has an equal correl-

ation at the 6th rank to variable 32 (r = 0·823), so too are variables 7 and 20, the total chiefdom score on services, (r = 0·830).

Some important associations are observable between links of variables 8 and 20. For example, there is a close relationship between an index of shape (38, r_1/ r_E) and lowland (17, land <200 feet); chiefdom area (15), the crude activity rate of the chiefdom as a percentage of that of the district (2); the chiefdom score on government and missionary development services (34) to variable 12, the density of population at one mile radius from the chiefdom town centre. There is also the convergence of variables 13 (number of settlements with a population over 500), 10 (chiefdom population), 35 (religious services), 21 (service score for chiefdom towns) on 31 (commercial and banking services).

This set of services tends to describe the essential nature of more developed chiefdoms or growth pole locations in Bombali - administrative areas where early government and missionary efforts designated early locations for human organisation. Some of these locations may have had an early advantage of spreading services to immediate hinterlands. The subsequent growth of settlements, population and commerce accelerated intersettlement interaction; but further growth is currently moderated by some major problems. These are mainly related to shapes of administrative areas (39, boundary length/area), the size of possible centres of eco-

nomic growth (43, population density at second mile radius from a chiefdom town centre), the compactness of population with respect to area (37, $\bar{d}_A / \bar{d}_p$), the availability of feeder roads (6) and the unbalanced impact of early motor road constructions (22, time-space convergence for 1900 - 1925).

One common characteristic of all chiefdoms is the presence of some functional centre, which, in this case, is the administrative town. There is the natural hierarchy between one such centre and others in Bombali. A classification of chiefdoms based on this factor alone may produce a simplification of complex associations between the chiefdom town and its hinterland, the district centre and the rest of Bombali, or the pattern of growth pole development. For this reason, more sophisticated methods of classifying chiefdoms have been used. For example, the patterns of underdevelopment identified in administrative areas of Bombali are hardly delimited without the application of factor analysis and grouping algorithms.

FACTOR ANALYSIS

The 49 variables are subjected to a Q-mode factor analysis to obtain a principal component matrix (Table 6.1) accounting for 89% of the total variance. At the sixth factor the total variance explained is 98%. The percentage of variance explained per observation is calculated from the first factor rotation (Table 6.2). In factor 1 more than 30% of

Table 6.1 Principal Component Factor Matrix

Chiefdom	1	2	3	4	5	6
Biriwa	0.9322	0.0950	-0.1532	0.2023	0.1904	0.0715
Sebora	0.8685	-0.3952	-0.1859	-0.1540	-0.0137	0.1679
Gbanti Kamaranka	0.9819	-0.0026	0.1417	0.0253	-0.0574	-0.0103
Libeisaygahun	0.9635	0.0629	-0.0702	-0.1304	-0.0340	-0.1670
Magbaimba	0.9352	0.1451	0.2682	-0.1443	-0.0037	0.0601
Makari Gbanti	0.9613	-0.1018	-0.0886	0.1183	-0.0956	-0.1009
Paki Masabong	0.9503	0.0750	0.1937	-0.0482	0.1751	-0.0033
Gowahun	0.9885	-0.1126	0.0587	0.1773	-0.0755	-0.0075
Safroko Limba	0.9706	-0.0987	0.0549	0.0314	0.0500	-0.0006
Sanda Tenraren	0.9631	-0.0999	0.1144	0.0337	-0.1518	-0.0004
Sanda Lokko	0.9822	0.0797	0.0650	0.0140	0.0176	0.0625
Sella Limba	0.9470	-0.0602	-0.1964	-0.1074	0.1233	-0.1316
Tambakha	0.8484	0.4313	-0.2516	-0.0380	-0.1312	0.0868
variance	89.176	3.343	2.508	1.278	1.113	0.800
cumulative variance	89.176	92.519	95.027	96.305	97.417	98.217

Table 6.2 Percentage of variance explained in factor matrix

Chiefdom	Factor 1	2	3	4	5	6	7	8
Biriwa	15.82	23.43	16.99	9.29	32.36	1.75	0.05	0.07
Sebora	72.66	5.92	12.07	5.86	2.64	0.59	0.02	0.01
Gbanti Kamaranka	17.40	13.91	42.71	18.13	4.64	2.06	0.15	-
Libeisaygahun	20.13	24.41	27.63	9.15	3.04	13.53	0.58	0.22
Magbaimba	10.22	16.63	63.66	4.73	2.41	1.01	0.62	0.44
Makari Gbanti	25.87	15.83	17.66	27.72	5.36	4.51	0.06	1.38
Paki Masabong	12.95	12.46	54.20	6.38	7.80	3.12	2.47	-
Gowahun	21.86	10.51	27.33	31.16	6.68	0.98	0.30	0.01
Safroko Limba	26.05	10.32	33.91	13.17	8.73	2.17	-	4.94
Sanda Tenraren	22.96	20.39	35.27	22.01	3.64	1.64	3.29	0.03
Sanda Lokko	17.15	21.47	39.11	11.74	7.59	1.24	0.05	0.18
Sella Limba	32.96	18.64	17.72	5.93	8.27	14.65	0.23	-
Tambakha	6.44	71.67	12.68	5.04	2.99	0.90	-	0.10

the variance is explained for two chiefdoms; Bombali (72·66%) Sella Limba (32·96%). In the second, Tambakha has 71·67% of its variance explained, while all other chiefdoms have scores below 30%.

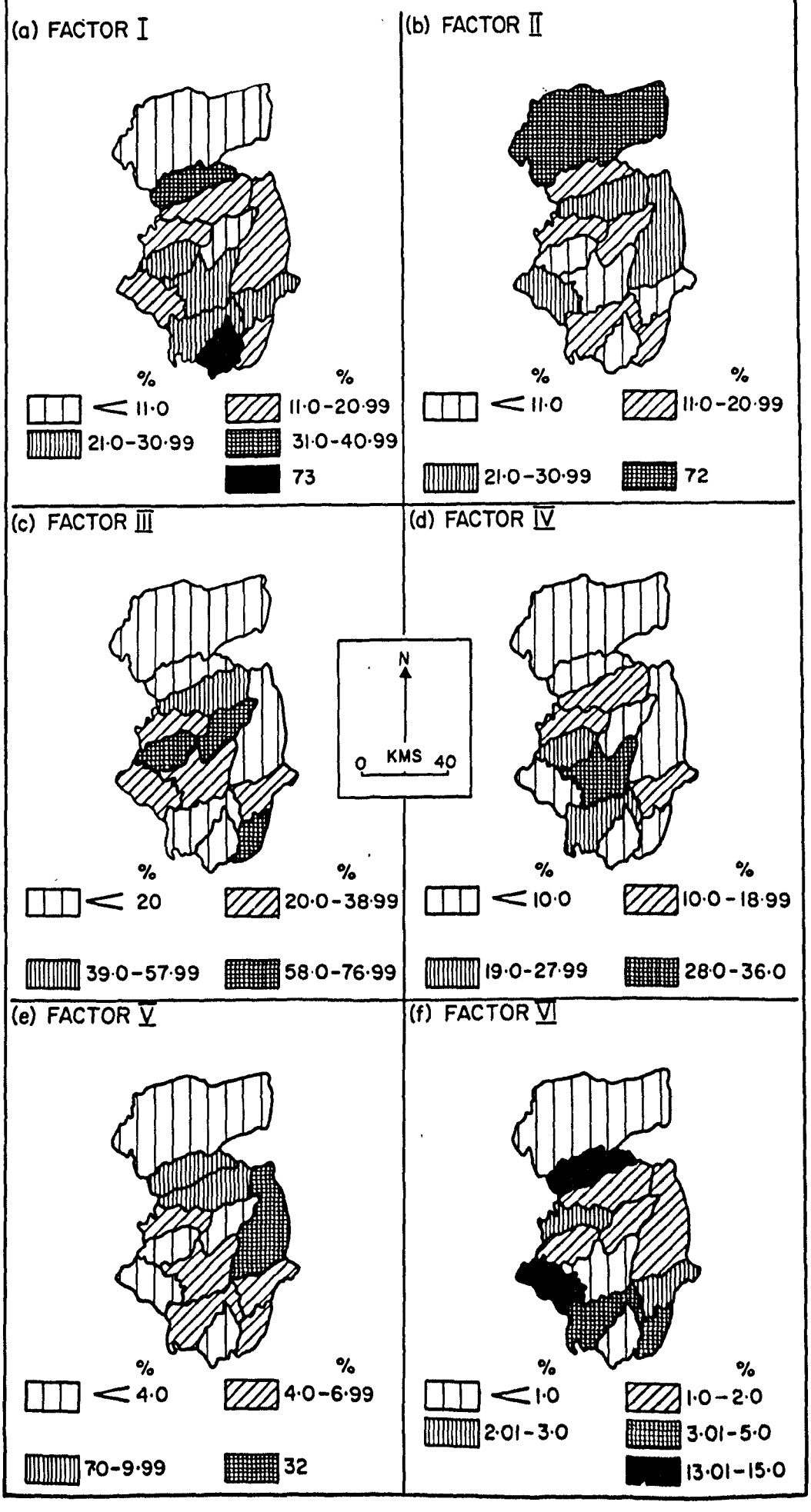
The third factor accounts for more than one third of the total variance for six chiefdoms, Magbaimba (63·66) Paki Masabong (54·20) Gbanti (42·71), Sanda Lokko (39·11), Tenraren (35·27) and Safroko Limba (33·91). The fourth accounts for 31·16% of the variance in Gowahun, while the fifth 32·36% of that for Biriwa.

Lower scores of individual variables are eliminated to assess characteristics defining each factor. Variables with scores of $\pm$ 1·0 and over are considered significant indices of the respective factors (Appendix 6.4). Three levels of significance have been used: low ($\pm$ 1·0- 1·5) medium ($\pm$ 1·51 - 2·0) and high ($> \pm$ 2·0). Variables with high scores in the first factor are mainly economic and human. There is a combination of characteristics like chiefdom town population, indices of link demands, special government and missionary development services, literacy, commerce and banks, posts and telecommunications. Other variables of secondary importance include service scores and settlements with a population of over 500. This factor identifies the main growth pole in Bombali - Makeni in Sebora chiefdom, hence the Sebora factor.

The second factor puts emphasis on characteristics like the size of chiefdoms, land area above 500 feet and upland

CHIEFDOM SCORES IN FACTOR MATRIX

Fig.-6·2



(200 - 500 feet), lengths of seasonal feeder roads; all of which have scores of over 2·0. A few human characteristics, like crude activity rates, are of some significance but it is mainly factors of size and shape that define this factor. This is a Tambakha factor.

The third combines variables of shape, accessibility and the impact of transport innovation. It is probably a historical factor which describes the impact of transportation in a time scale; and reasonably identifies Magbaimba, Gbanti Kamaranka and Paki Masabong. The fourth is a settlement factor in lowland areas. The fifth emphasizes rural characteristics of uplands; while the sixth combines land above 500 feet with high negative values for medical, government, missionary development services and seasonal feeder roads.

Factor I therefore tends to separate more developed chiefdoms from the less developed. The location of Makeni in Sebora puts this administrative area in a higher stage of development than Kamakwie (Sella Limba) which is a poor second most advanced in Bombali (Fig.6.2a). The least developed are Tambakha and Magbaimba, closely followed by Sanda Lokko, Gbanti Kamaranka, Biriwa, Libeisaygahun and Paki Masabong. Between these chiefdoms of least development and the more developed are four moderately developed administrative areas - Sanda Tenraren, Gowahun, Safroko Limba and Makari Gbanti. Excluding Sanda Tenraren the other chiefdoms in this category have some advantage of contiguity to Sebora, contrasting with Sella Limba which is surrounded

by less developed administrative areas.

The second factor eliminates Tambakha which has about 72% of its variance explained. The variables describing it mainly relate to the size of the administrative area, the dispersed nature of its population and the high level of crude activity rates. Other chiefdoms closer to Tambakha include Libeisaygahun, Biriwa and Sanda Lokko (Fig. 6.2b). While Sebora chiefdom has the least percentage of variance explained (5·92), Sella Limba has a moderately high value (18·64). This probably means that if one disregarded the urban or growth pole functions of Kamakwie, this chiefdom is as underdeveloped as the others. Even moderately developed chiefdoms of Gowahun and Safroko Limba have lower scores on this factor. Tambakha is in a category of its own and three other chiefdom types can be described in this factor: a) Sanda Lokko, Libeisaygahun and Biriwa; b) Sella Limba, Gbanti Kamaranka, Magbaimba, Makari Gbanti and Paki Masabong; c) Sebora, Safroko Limba and Gowahun (Fig. 6.2b).

The third factor, largely a function of shapes of chiefdoms and accessibility of populations in certain areas, is the most important in the matrix. The absence of large areas of lowland and large settlements probably contributed to access problems facing some chiefdoms - Magbaimba (63·66), Paki Masabong (54·20). Gbanti Kamaranka (42·71). Next to these three cases are Sanda Lokko (39·11), Sanda Tenraren (35·27) and Safroko Limba (33·91). As in the second factor the score for Sebora is least (12·07), followed by Tambakha

(12·68), Biriwa (17·66) and Sella Limba (17·72).

Factor IV explains only 13·12% of the total variance in the matrix but is fairly important as it tends to eliminate Gowahun, Makari Gbanti and Sanda Tenraren (Fig. 6.2d). Chiefdom scores of higher values describe areas where medical and religious services tend to be established at settlements which are not necessarily important service centres but have good road links. The score for Gowahun is 31·16, that of Makari Gbanti, 27·72; and Sanda Tenraren 22·01. Other chiefdoms have relatively low scores (Table 6.2), but it is worth noting the relatively advantageous placement of these three administrative units in the transport network of the district. They are neither too far nor too close to Sebora. Each of these chiefdoms had at least three settlements with populations over 500 by 1963, contrasting with other chiefdoms like Magbaimba and Paki Masabong which had none.

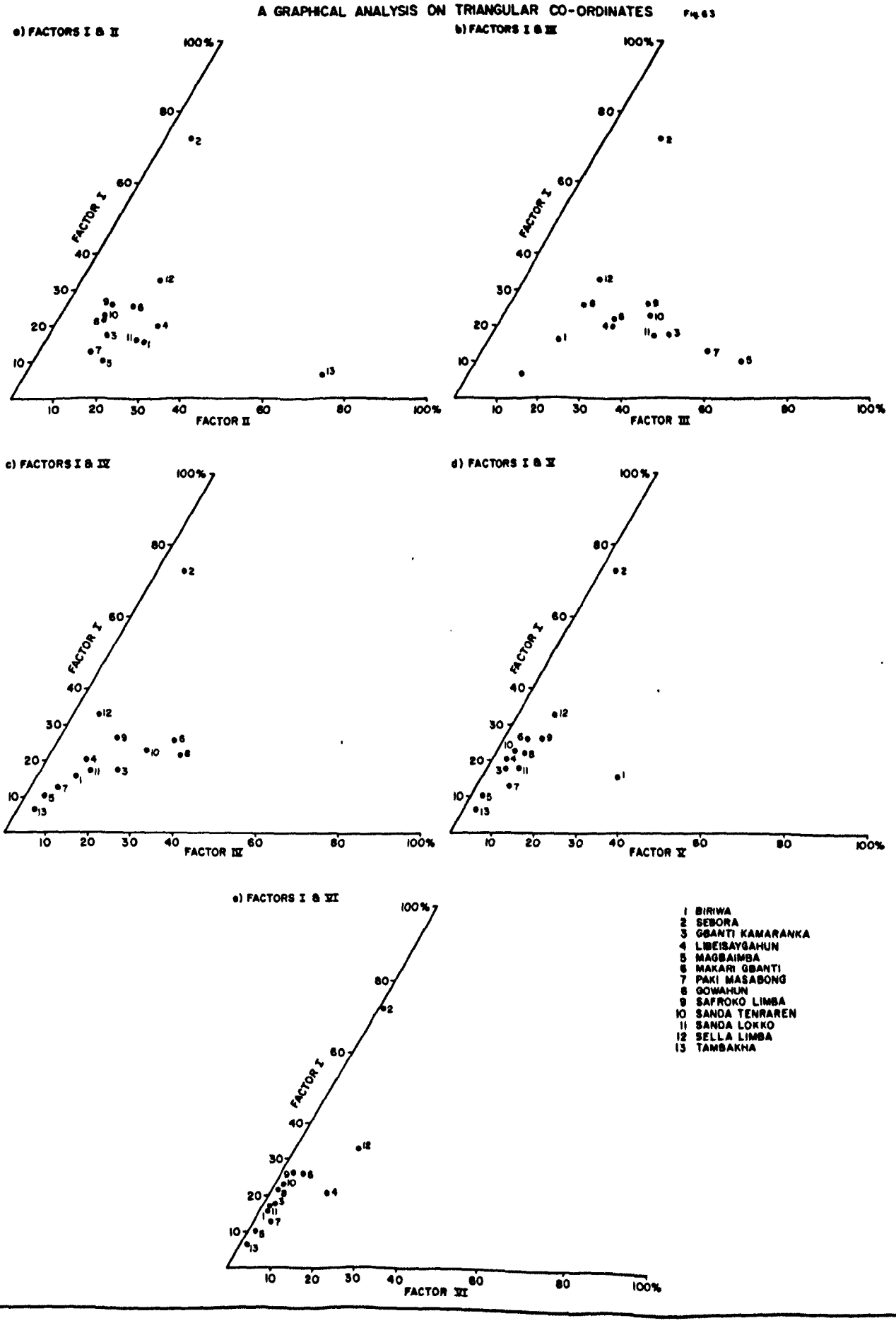
The fifth factor describes a situation where the early introduction of motor roads has not been followed by a continuous development of feeder roads. The population here is predominantly dispersed and engaged in upland farming. Scores for most chiefdoms are low and, excluding Biriwa, all are under 10·0%. Magbaimba, Sebora, Tambakha, Libeisaygahun and Sanda Tenraren have scores below 5·0. Biriwa with a score of 32·36 is most characteristic of this loading - a large chiefdom with the largest population (24,546) which

is highly dispersed and still dependent on footpaths as a means of travel. Chiefdoms contrasting with this situation are either areas of high rural densities or of greater feeder roads for hinterland populations.

Factor VI has an association of land above 500 feet with upland (200 - 500 feet) and measures of link demands. It describes upland situations where variables like medical services, feeder roads, special government and mission developement services are probably underutilised. The problem here is definitely not a physical limitation but most likely the awkward location of service centres with respect to the present pattern of the district's transportation network. Chiefdoms with higher scores in this loading are either early mission or administrative outposts with declining or stagnating chiefdom towns. The original services located at this type of town are within stagnating settlements. Sella Limba has the highest score for this factor (14·65) followed by Libeisaygahun (13·53). Chiefdom towns like Batkanu and Kamakwie are probably surviving through shear inertia. Their remote locations in the transport network make them less attractive and competitive with respect to service establishment and use (Fig. 6.2f).

These six factors present a fairly clear basis for classifying chiefdoms. While the first eliminates the most advanced, it is the growth pole effect of the administrative centre that accounts for this; hinterland situations being

PERCENTAGE OF VARIANCE EXPLAINED ON MATRIX
A GRAPHICAL ANALYSIS ON TRIANGULAR CO-ORDINATES Fig 63



fairly similar in most chiefdoms. The second factor describes the opposite of the first,and the third, fourth and fifth and sixth show variations of chiefdoms between these two extremes. Hence, in Factor IV Makari Gbanti and Gowahun describe situations where advantages of accessibility are not fully exploited, resulting in the movement of people from more accessible locations - Bendembu, Kalangba - to areas of lower accessibility where services are located. The third factor eliminates Magbaimba and Sanda Tenraren - chiefdoms where the main transportation routes barely cut across the short breadth of their territories.

The fifth factor describes Biriwa, a chiefdom with few feeder roads reaching the chiefdom town. The early development of the Kabala road which links Makeni to Kamabai had short lived effects. The sixth factor probably indicates the location of some services in areas that are too distant to be fully exploited. The underlying problem here likely involves a reorganisation of the administrative status of either of the chiefdom towns in these areas, or an increase in connectivity of the transport network.

Chiefdom types cannot, however, be discussed in isolation because these administrative units share some common problems with some degree of variation. One way of explaining this overlapping effect is by graphical analyses of factor scores in the matrix (Figs. 6.3a-e). For example, the first loading in the matrix is related to the other five, to illustrate chiefdom groupings on a two-factor basis.

The first graph describes the scatter of chiefdoms with respect to factors I and II (Fig. 6.3a). Here Sebora and Tambakha are at extreme poles; Sella Limba is a simple chiefdom type, while Magbaimba and Paki Masabong form another group. The remaining eight chiefdoms are a general group with some minor variations within them.

Factors I and III account for 54% of the total variance in the matrix. These two are, therefore, very important and illustrate a more complex scatter of chiefdoms (Fig. 6.3b). Tambakha and Sebora are at opposite ends. Magbaimba is still fairly close to Paki Masabong. Biriwa is fairly isolated, and the other chiefdoms tend to group in twos - Sanda Lokko and Gbanti Kamaranka; Libeisaygahun and Gowahun; Safroko Limba and Sanda Tenraren; Sella Limba and Makari Gbanti. The third graph relates factor I to factor IV (Fig. 6.3c). Here Sebora and Sella Limba form separate groups. There are three sets of clusters in the graph: a) Tambakha, Magbaimba and Paki Masabong; b) Biriwa, Libeisaygahun and Sanda Lokko; c) Makari Gbanti and Gowahun. Safroko, Gbanti Kamaranka and Sanda Tenraren are more closely associated with the third cluster.

The scatter of chiefdoms in the fourth and fifth graphs is along the factor I axis. In figure 6.3d there is a general group of eight chiefdoms, most of which are a sort of wedge separating Makeni from Kamakwie and Batkanu - Paki Masabong, Sanda Tenraren, Gbanti Kamaranka, Libeisaygahun,

Gowahun, Makari Gbanti and Safroko Limba. Biriwa and Sebora form two fairly opposite types. Tambakha and Libeisaygahun are in one group. Figure 6.3e is a slight modification of the distribution in figure 6.3d. Single-type chiefdoms here are Sebora, Sella Limba and Libeisaygahun. Paki Masabong is clustered with Biriwa, Gbanti Kamaranka and Sanda Tenraren; Gowahun with Safroko Limba and Makari Gbanti; Tambakha with Magbaimba.

The separation of chiefdoms is easier on a three factor rotation (Table 6.3) Factors I and II remain Sebora and Tambakha determinants respectively, while factor III mainly describes Magbaimba, Gbanti and Masabong chiefdoms. Sella Limba is still second to Sebora in Factor I, Biriwa second to Tambakha in factor II. Gowahun and Safroko have average values for both factors I and II. Sanda Lokko and Tenraren have average values in factor III and lower ones in other factors, while Makari has an average value in factor I alone. Libeisaygahun has generally low values on all factors, depicting the stagnating characteristics of this chiefdom and its administrative centre.

A simplified pattern of chiefdom separation produces the following group types:

a. Bombali a_1 Sella Limba a_2 Makari,

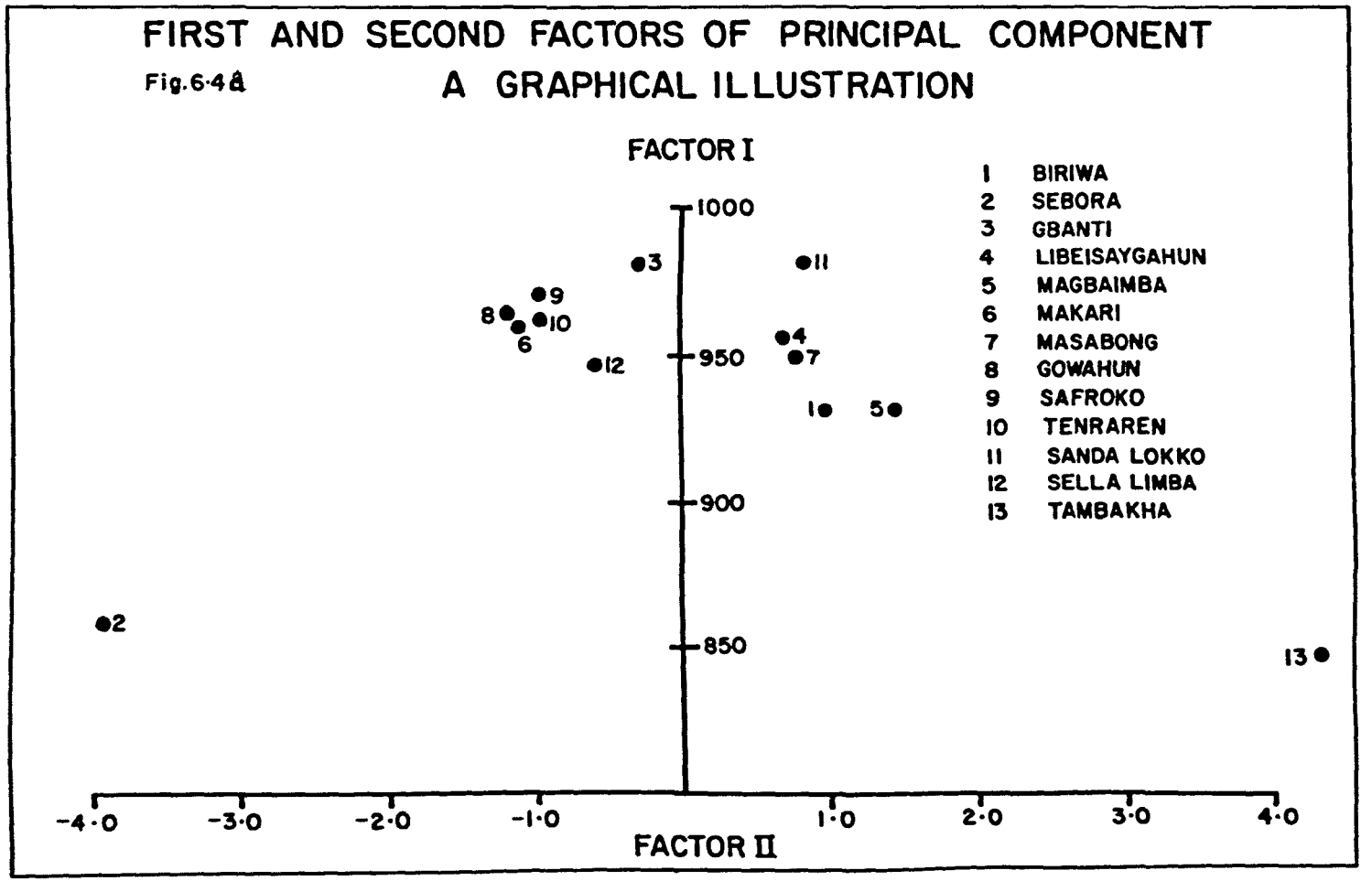
b. Tambakha b_1 Biriwa,

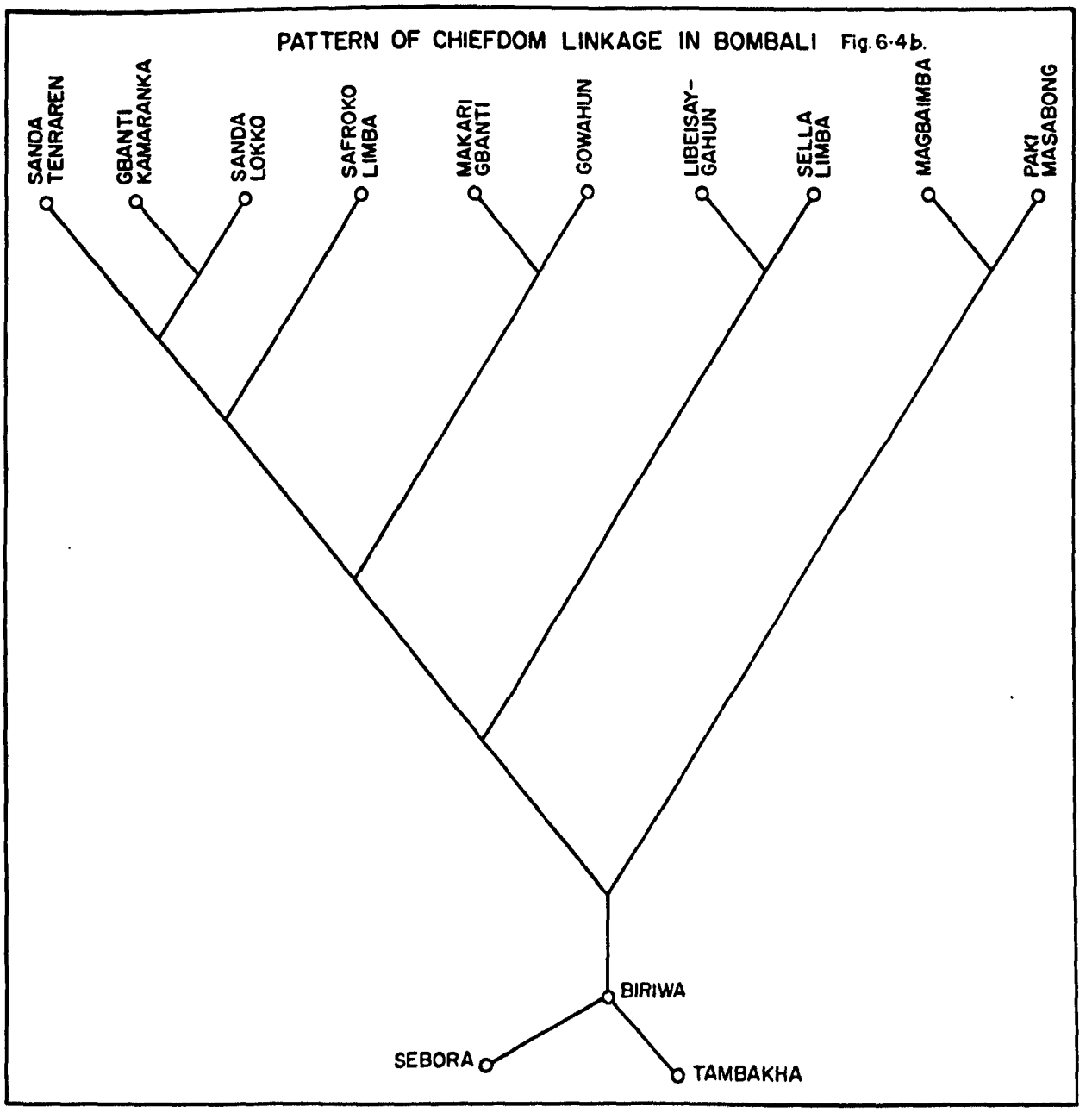
c. Magbaimba, Gbanti, Masabong,

d. Gowahun, Safroko,

Table 6.3 Normalized Varimax Factor Components

Chiefdom	Comm.	1	2	3
Biriwa	0.9015	0.3278	0.4236	0.2486
Sebora	0.9451	0.7923	0.0709	0.1368
Gbanti Kamaranka	0.9842	0.2832	0.1855	0.5318
Libeisaygahun	0.9372	0.3259	0.3465	0.3275
Magbaimba	0.9676	0.1244	0.2033	0.6723
Makari Gbanti	0.9424	0.4836	0.2272	0.2892
Paki Masabong	0.9463	0.1993	0.2041	0.5966
Gowahun	0.9404	0.4164	0.1547	0.4289
Safroko Limba	0.9548	0.4063	0.1657	0.4280
Sanda Tenraren	0.9507	0.3740	0.1388	0.4872
Sanda Lokko	0.9752	0.2559	0.2809	0.4632
Sella Limba	0.9390	0.4907	0.3089	0.2004
Tambakha	0.9691	0.0893	0.7631	0.1476


FIRST AND SECOND FACTORS OF PRINCIPAL COMPONENT
Fig.6·4a
A GRAPHICAL ILLUSTRATION
FACTOR I
1000
950
900
850
1 BIRIWA
2 SEBORA
3 GBANTI
4 LIBEISAYGAHUN
5 MAGBAIMBA
6 MAKARI
7 MASABONG
8 GOWAHUN
9 SAFROKO
10 TENRAREN
11 SANDA LOKKO
12 SELLA LIMBA
13 TAMBAKHA
-4·0
-3·0
-2·0
-1·0
1·0
2·0
3·0
4·0
FACTOR II


PATTERN OF CHIEFDOM LINKAGE IN BOMBALI Fig.6·4b.
SANDA TENRAREN
GBANTI KAMARANKA
SANDA LOKKO
SAFROKO LIMBA
MAKARI GBANTI
GOWAHUN
LIBEISAY-GAHUN
SELLA LIMBA
MAGBAIMBA
PAKI MASABONG
BIRIWA
SEBORA
TAMBAKHA

e. Sanda Lokko, Tenraren,

f. Libeisaygahun.

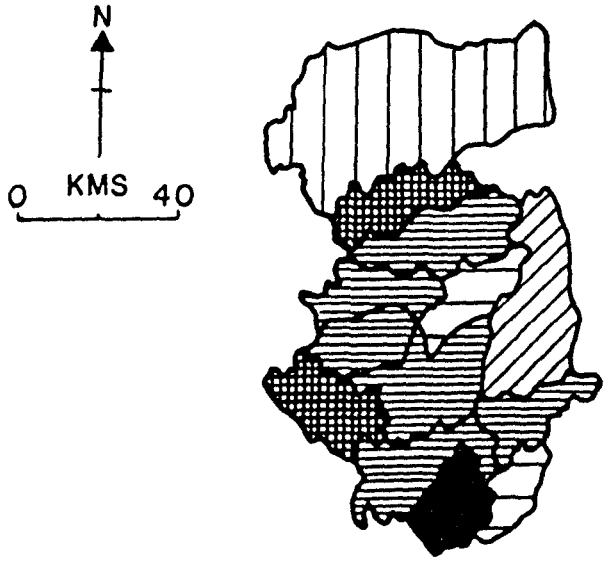
Difficulty in this type of simplified grouping arises from high values of some chiefdom scores in other factors. For example, Biriwa has a high score in factor II and a moderate one in this factor I. Sella Limba has a relatively high score in factor 1 and a moderate one in factor II. On the three factor rotation the main characteristics separating chiefdoms are more complex: accessibility, population as well as service concentrations.

On the principal component matrix a simpler grouping can be observed as the accessibility characteristic tends to be a singular eliminator of more developed and less developed chiefdoms (Fig. 6.4a) The scatter of chiefdoms in Figure 6.4a clearly indicates two most dissimilar chiefdoms: Sebora and Tambakha. Other single type chiefdoms like Sella Limba, Gbanti, Libeisaygahun, Masabong, Biriwa, Sanda Lokko and Magbaimba are within fairly average distances from Sebora and Tambakha. Within this scatter of single type chiefdoms are Libeisaygahun and Masabong which are fairly clustered. Beyond Sella Limba there is a large cluster of administrative units: Makari, Gowahun, Safroko and Tenraren. These are central chiefdoms in the district and are more accessible to Sebora than any other administrative units.

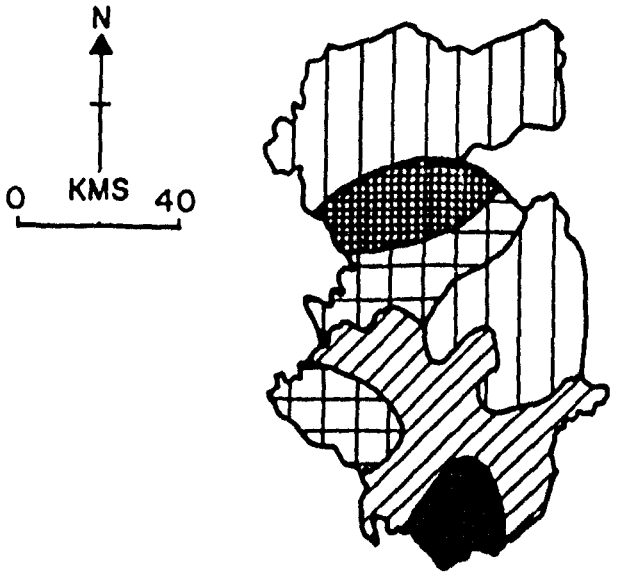
LINKAGES

Perhaps the separation of chiefdoms is better resolved by grouping algorithms. Individual chiefdom values in the

CHIEFDOM TYPE REGIONS Fig. 6·5



GROWTH TYPE REGIONS Fig.6·6



first rotation are computerised in a simple linkage programme (Appendix 6.5) to obtain a more accurate classification of chiefdom types (Figure 6.4b). As in the classification obtained from the three factor rotation nine chiefdom types have been identified by grouping algorithms. There are however a few variations as four of these types are in groups of two chiefdoms while five are single types. Magbaimba is grouped with Masabong; Libeisaygahun with Sella Limba; Makari with Gowahun; and Gbanti with Sanda Lokko. Single type chiefdoms are Sanda Tenraren, Safroko Limba, Sebora, Biriwa and Tambakha.

These variations are high considering the fact that Bombali only forms a small part of the underdeveloped Northern Area of Sierra Leone. They are however an indication of the amplitude of the problem one has to contend with in rural development even at this district level. A further generalisation of this classification provides a more simplified pattern (Fig. 6.5). The central chiefdoms separating Makeni, Kamakwie and Batkanu are a fairly contiguous zone. Provided present external boundaries of the district are not modified, these central chiefdoms will continue to restrain the imbalance in development of Makeni, Kamakwie and Batkanu.

Chiefdoms with special development problems are most likely to be Tambakha, Magbaimba and Biriwa - areas with few or no feeder roads, few if any large settlements, mass illiteracy of scattered peasant cultivators, remoteness from

centres of higher economic activity and contiguity to underdeveloped hinterlands of other chiefdoms. While Tambakha accounts for about one third of the district area its population is barely 5% of that of Bombali. On the other hand, Biriwa with about 11% of the district area accounts for 11·4% of its total population. One is thus confronted with two basic problems - the organisation of human occupance and land exploitation, and the construction of feeder roads.

GROWTH POLES

Probable growth pole/hinterland relationships in Bombali can be summed up from a simple distribution map in which five main types can be identified (Fig. 6.6). Type I is Sebora chiefdom in which Makeni, the district centre is located. Type II contains Kamakwie, in Sella Limba chiefdom which is a secondary growth pole for Bombali as a whole. Type III describes Batkanu in Libeisaygahun, a decaying pole whose growth tends to be hampered by its extreme location in the district transport network, and by the impact of more centrally situated chiefdoms like Gowahun, Makari Gbanti, Safroko Limba and Sanda Tenraren.

These central chiefdoms have tertiary centres (Type IV) but are of considerable potential for growth, provided that services are established in them. The remaining chiefdoms have weak or infantile growth centres (Type V) and are either at remote locations - Fintonya(Tambakha), Kagbaray (Magbaimba), Kamabai (Biriwa) - or being hampered by contig-

uity to more developed centres - Kamalo (Sanda Lokko), Kamaranka (Gbanti Kamaranka) in relation to Kamakwie, Mapaki (Paki Masabong) in relation to Makeni.

Planning for rural development in Bombali has to contend with considerable variations in chiefdoms. It is better to understand these variations before defining objectives for development. Problems of administration and traditional values are too numerous to mention and usually have one common characteristic, namely the unpredictable human response to the challenge of rural development. More basic structural problems are related to the inadequacy of the infra-structure as a whole. For example, one thinks of the immense concentration of basic services in chiefdom towns, the inaccessibility of these towns to their hinterlands, the disadvantageous displacement of some chiefdoms in the transport network, the preponderance of the population in low income primary activities and the sparseness of services in the district as a whole. Problems of illiteracy, traditionalism, and the persistence of rural poverty are related to remoteness of settlements from centres of innovation.

The human being that outlives these problems may have to evolve through a long process involving vital changes in concepts of production, family sizes, land ownership, local responsibility in the definition of development objectives and nationhood. The most capable agency to speed up such changes is government. The objectives at a national level

should involve a careful review of government priorities in rural development if only at a scale as low as the chiefdom.

Rural development has more often than not been regarded as a host of economic problems, to such an extent that local human and environmental factors have been neglected or underestimated. The orthodox indicators of development and economic growth are all too well known - per capita incomes, cost of living indices, saving potentials, marketing, the availibility of credit facilities and a host of other characteristics. In Bombali, such indicators are yet to produce sub-regional variations; for one is dealing with an environment where the human resource sector is probably slow to fit into some model of economic growth.

Another common problem with national governments is related to some obsession with increased primary production to protect feeble currencies. The United Nations Development Agencies have probably had some success in improving the lot of rural masses in underdeveloped countries; but one doubts whether it is realised that while the fruits of modern technology are being absorbed in such countries at a very rapid rate, the human being that is doing the absorption faces the challenge of change at a less rapid rate. Consequently, there are problems of mass wastage of capital goods and these economies experience greater strains in reaching stages of processing primary produce, let alone manufacturing.

A careful study of sub-administrative areas within a clearly defined political region can identify many local characteristics which may have far reaching effects upon the development process. For example, the study of patterns of underdevelopment in Bombali stresses four principal objectives in development: a) the identification of problem areas within a politically defined region, b) the definition of structural elements in local economies, c)the importance of the human factor and d) the need for a more objective definition of incentives for local development.

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CHAPTER VII

SOME HUMAN OBSTACLES TO DEVELOPMENT IN BOMBALI

INTRODUCTION

The population of Bombali is predominantly rural and poor. The occurrence of 90% of the working population in primary production affords the strongest index concerning the level of development in the district. In previous chapters, attempts have been made at describing in general terms what Forde calls "the visible results of economic growth "(1966, iii). Such results in the district closely describe situations in which incomes have not reached a stage of capital formation. The society has not been very successful in attracting various forms of internal, let alone external, investment. The district is a political rather than a geographical region, and this characteristic is expressed by its displacement across three parallel geographical (physical) regions of the country.

The present state of development in Bombali is clearly the result of external and internal influences which may have cultural, physical or structural expressions. For example there is the contiguity of tribal chiefdoms within and outside Bombali. The southwestern swamps form an eastern extent of a larger Boliland region of districts west and south of Bombali. The upland region extends south westward across Tonkolili while a more hilly landscape merges imperceptibly into Koinadugu. The transportation network depicts a situation where structures external to this district may be of greater significance.

Interest in this chapter concerns human responses to the present level of economic development, an aspect that has a considerable impact in both development policy planning and implementation. As Spencer puts it:

> "'Development' is a complex cultural process, one involving time, elements of culture, learning processes, psychological acceptances by the populations; and the understanding of the relations of peoples and cultures to environments: for no two peoples, two cultures, two environments can the same precise measure be applied as a judgement of 'developedness'." (1960, 37).

In other words, characteristics of human societies can be as difficult to generalise as their environments. The problem can be more accentuated in underdeveloped countries where the search for the nature of underdevelopment is at one initial stage at the local community level. The study of human obstacles to development involves a broad generalisation of the framework against which any suggestions for future development planning can be made. This in itself is of basic significance especially if one accepts that economic development is "the accumulation of productive means to meet the expressed needs of a particular population" (Randall, 1957, 263). The definition of particular human needs in development planning is not as problematic as the understanding by the human group involved.

The impression one has of local people in Bombali is uncertainty concerning their ability to define local needs

for development. It is less likely a problem of not knowing what one wants; rather it is probably an apathy emanating from an obsession that a land without known mineral resources has no bright prospects for investment and other forms of exploitation. The difficulty in transporting agricultural products to large townships tends to discourage any large-scale farmer. The district is unfavourably situated with respect to more prosperous townships in the country - Freetown and the mining areas. These larger townships have agriculturally productive hinterlands at shorter distances and compete favourably to more distant sources of food supply which have to resolve overhead costs of transportation and storage.

The response of various sectors of society to development must be examined with a recognition of Bombali as a remote and fairly difficult environment for which most economies of scale in primary productivity tend to be unfavourable. Increased agricultural productivity may have to contend with problems other than transportaion, marketing or credit facilities. Presently there is no processing industry in the district. The level of literacy is barely 2% of the total population and this portion of the population is concentrated in the administrative centres and engaged in non-farm service occupations. Education has hitherto been regarded by many as the primary means of abandoning the farming profession for more lucrative jobs, so that few if any educated people are full time farmers in Bombali. It thus appears that while agricultural development holds the key for economic growth in this part of the country, the organisational

basis for its smooth operation tends to be disturbed by an inefficient infrastructure and an agricultural population that is predominantly traditional in outlook.

SECTORS OF THE BOMBALI COMMUNITY

The characteristics of roles of nine sectors of the Bombali society have been studied - a) the illiterate and rural mass, b) the educated local population, c) local authorities, d) religious agencies, e) traders, both local and foreign, f) foreign business enterprises engaged in agriculture, g) external agencies involved in rural development study and work, h) the Fullah herdsman and i) central government agencies. Of these nine groups the sector most affected by any form of development should be the rural majority which is traditional, illiterate and poor, but which has control over land. From previous studies of the family as a unit of production it was observed that agricultural productivity is of a peasant nature, land tenure and land use are closely associated with local concepts of family sizes and property ownership (Chapter II).

Illiterate peasants

The problem posed by this sector of society is one of traditionalism which is expressed in various forms. The occurrence of group feeling is subtle but has its expression in associations like clans, tribes or membership of a secret society. While religion has contributed substantially in educating rural man, it has had little impact on his traditional beliefs. Land remains the most important expression

of wealth and security, for when every other source of income fails the peasant can always resort to farm work. For him therefore, poverty is not strange, it is a normal endowment with a perpetuity he is neither prepared nor qualified to change. The introduction of a cash economy to his environment has only had the effect of earning to produce some essentials of life - cheap clothing and shoes, paraffin for fuel and some house ware. It is all remote from capital saving.

This rural sector is tribal in outlook and suspicious of motives of other sectors, especially those who have been detribalised through education, and central government agencies whose civil servants are composed of other tribal elements and cannot speak the same language. The man who can read and write is often regarded as dishonest and proud, He is thought to have acquired tricks (education) at an early age and therefore no longer has respect for older members of the community who have more intelligence (common sense). Some of these local feelings may not be substantive but it is important to note a basic flaw in accepted thought which tends to equate the ability to read and write with common sense, experience and behaviour. In other words, if education erodes all the traditional values respected in a given community, then in the eyes of traditional leaders, there is no need for it.

What is normally regarded as good behaviour in such communities can be meaningless in more sophisticated circles.

For example a woman is expected to bow when passing across a male gathering or when serving drinks. She is not expected to discuss problems in common with males, and if she is old enough to attend meetings of male decision makers, her role is one of silence and peace making between rivals. The educated woman deviates from most of these accepted practices, for example she wears slacks - often interpreted as a challenge to male supremacy. Educated youngsters practising habits of cleanliness may be regarded as proud. The basic problem is not only one of ignorance, it is also a constant fear of breaking the society as it currently functions.

It is this fear that saps away local confidence of group leadership in a situation where the leader can read and write. A group leader is expected to protect the hierarchy in society, and upkeep tribal or clannish norms, and educated elements are too prone to forget such demands of office. Local leaders are consequently as traditional as members of their group. Those educated elements who succeed in being accepted by this sector are few and are probably lucky to have gone through all stages of child development in the locality - such as the rituals involved at the circumcision stage and early membership in secret societies. These fortunate few are normally less migrant - the primary or secondary school may not be far from home.

The importance of local leadership in the implementation of development policy needs no emphasis. In Sierra Leone, the establishment of the first boys' secondary school in

the provinces, at Bo, was to educate sons of chiefs who would in due course become the educated elite to rule the community. The hope of the colonial administration was to provide broader perspectives at levels of decision making. For example an illiterate chief may be influenced in ways of thinking and decision making by the presence of an educated heir while the educated chief can provide sound leadership over a community. This idea was constructive but shortsighted. What was not taken into consideration was the fact that the appointment of a chief is based on some democratic practice involving an election by a local authority, from a ruling house whose turn it was to present a candidate. Some ruling sons of chiefs had the opportunity of an early education but other incumbents did not. In Bombali only 7 of the 13 chiefs can read or write and three of these have had some high school education.

What most people still forget is the proposition that literacy is not always a guarantee of sound leadership, especially when education is limited to the secondary school stage. Perhaps former colonial administrators can attest that the implementation of development policy had better chances with uneducated chiefs who had sufficient common sense to accept innovations. What is difficult to explain in Bombali is that some of the chiefs are educated but this does not reflect the level of economic development in chiefdoms. There is an element of distrust between chiefs and their subjects and this arises from the role of the chief as defender of land rights for tribal groups.

The present situation on land transfers is that the chief, as signatory on any chiefdom land transaction, receives one third of the money paid for the transfer of land, excluding the usual hand shake fee. The land owner with only one third of the share is hardly satisfied and therefore reluctant to sell land. Some chiefs go to extremes of farming where they like. Local land owners accept this practise and even operate chiefs' farms with some quiet reservation. It is likely that this situation, where a peasant is silent over domination and exploitation, breeds a lack of interest in local participation in development. The peasants have a subtle way of showing outward respect and allegiance for authority, although within them lies bitter resentment.

The ultimate essence of existence hinges on a level of productivity that is enough to meet a family's needs for the next growing season. A small surplus is exchanged in cash or kind for other essentials of life. Excluding domestic food needs, there are two principal causes for agricultural surpluses: a) demands of ceremonial activities and b) the desire to increase the family size, the peasant's main index of prosperity and social security. In periods of good harvests a farmer sells farm produce for cash or exchanges for cattle. He then goes for a second, third or fourth wife. For the farmer, this is a perfectly logical move, because he is assured of two important in-puts in farm operation: a) there is more labour and b) access to other farm land. He reaches a point where he can no longer increase his family size and it is at this stage that he starts saving and petty

trading. He does not like banking services, because he can neither read nor write, but more important than anything else, banking exposes what he considers the most secret of all things - his income. In polygamous families the most beloved wife may have access to the keys of the food box, but a member of the family will be lucky to know where he keeps his money before he gives up the ghost.

Ceremonial activities absorb a fairly large proportion of farm incomes. The occurrence in the dry season of most festivals related to graduation ceremonies after initiations to secret societies, anniversaries of deaths of cherished ones is not a simple climatic necessity. It is at this time that money is most easily earned. Families in the upper sector of society tend to distinguish themselves by celebrating in the rainy season when food is scarce. For poorer families, failure to respect the dead by sacrifices and feasts is as great a shame as the inability to celebrate on the occasion of graduation from secret societies and circumcision. Most of the harvest that can be classified as surplus over seasonal food needs is sold and there is a tendency to sell beyond this surplus.

The spiral of poverty and indebtedness that overwhelms the peasant is hard to explain and the potential for saving is negligible. During the rainy season when food is scarce rice traders sell back to villagers the rice they bought from them at double the original cost price. If there is no

money to pay for rice which is badly needed in the home, it is usual to borrow with the hope of paying back at harvest time. In a case of need for building material like corrugated iron sheets, it is a common practice to borrow building materials from the Lebanese businessman for payment in kind in the harvest season. The cycle of events between production and income is fairly simple and involves an initial stage of farm work and debts, harvests, celebrations, payments of past debts and acquisition of fresh commitments.

Indebtedness in rural communities of peasants needs some qualification. Certainly, the ability to acquire debts and resolve them is vital in economic development. For the peasant, debts over lengthy periods are a burden to the entire production unit - the extended family. They are a form of slavery and a shame to the head of the family. The nature of indebtedness in this sort of society is different from that involving credits for investment in agricultural productivity and most farmers are loath to accept the latter. An introduction of credit facilities for long term investment must be capable of providing short term expression of these facilities to attract the ordinary farmer.

Levels of advancement in agricultural productivity have often been assessed by types of farm tools, efficiency in management and farm operation. In Bombali the peasant farmer is more dependent on the machete and hoe. The tractor is gradually being introduced. Currently about six farm operators own tractors in Bombali, three of these are owned by Fullah

herdsmen who are virtual absentee farmers employing cheap labour and returning to the farm at harvest time to supervise threshing and storage; the other three are owned by local politicians of national importance. The problem of mechanisation in Bombali arises from several factors - a) the control of economic forces of production by a small but viable sector of society - the absentee farmers, b) the inability to pay in cash for government tractor rentals and fertilisers, c) the need to operate larger farms, foreign to the practices of shifting cultivation, and d) the absence of a machinery to administer other systems of resolving credits on farm inputs to suit the peasant.

The question one faces on the role of the shifting cultivator is simple and relates to the extent to which one can judge agricultural productivity through levels of technology. Boserup's conclusion concerning this question is worth mentioning:

> ..."it was natural, therefore, to view agricultural development as determined by a process of gradual change to better and better tools whereby out-put per man-hour in food production was increased and part of the population made available for non-agricultural activities. This theory is apt to mislead because it ignores the fact that the kind of agricultural tool needed in a given context depends on the system of land use: some technical changes cam materialise only if the system of land use is modified at the same time and some changes in land use can come about only if they are accompanied by the introduction of new tools "(1965, 23).

In Bombali the tractor is gradually being introduced without changes in systems of land tenure and land use. These constraints on increased productivity are a disadvantage to the peasant farmer. The tractor may spell increased productivity but there is uncertainty concerning long-term returns of such an innovation in a situation where the peasant land owner is not directly participant. If a government can finance a tractor rental scheme it should be capable of undertaking peasant repayments in kind for credits accrued from tractor rentals. This part of the tractor innovation has not yet been introduced. The illiterate peasant farmer continues to till the uplands and narrow valley bottom swamps while the open fertile bolilands are exploited by government operated tractors on behalf of people who can afford the rents.

The peasant's hesitation in surrendering land rights stems from three probable factors - a) the growing awareness that upland areas cannot stand long periods of cultivation and that narrow valley bottom swamps cannot provide local farm land needs, b) a growing concern that the possible growth of large scale farming will disrupt traditional farm practices and c) a gradual development of absentee farmers whose exploitive operations are currently viewed with suspicion. These factors tend to breed total reluctance to change from the present state of land holding. The absentee farmer naturally has no interest in a role of guiding land owners to appreciate the importance of changes of this nature. Most land transactions are local and individual deals with

little administrative control. Contrasts between town and village are accentuated because accepted practises of land transfers for building in towns are not applicable in agricultural land.

Indigenous Literates

The educated rural population are too few to have much impact in economic change. The idea that the educated person can earn higher incomes in non-farm activities is still prevalent. The concentration of such educated elements in larger townships is related to some attraction to urban living even at this level, and the relative ease of finding non-farm occupations. Most of the higher educated elements within the district are probably foreign to it by birth - foreign businessmen, civil servants. It is interesting however, to note that while this sector of society is least trusted by the illiterates, it forms the strongest protector of land rights. Having been exposed to urban living, such elements are more conscious of their rights and aware of cash economies and needs for rural development. Their migrational tendency is largely due to the inadequate work opportunities and services at their places of birth. It is from this sector of society that the local businessman and entrepreneur emerges. He is a product of both the modern and the traditional, and apt to exploit both sectors of society. He introduces the foreign businessman to the local market and this function demands a creation of trust between the financier and the farmer.

A few local examples tend to show that this sector of society may have contributed considerably towards economic stagnation in Bombali. When Barclay's Bank established a branch at Makeni it was thought that the introduction of credit facilities to potentially productive elements in Makeni could induce greater business and local commercial enterprises. Large undisclosed sums of money were given to people on long term credits and most of this money was spent on building houses, purchase of trucks for transportation. In the end these loans were not resolved and Barclay's had to write them off. The district councils, in an effort to improve housing conditions in larger villages decided to offer advance loans on corrugated iron sheets in the early 1950's. The more enlightened sectors of society took advantage of this offer and accrued debts which also had to be written off. Again, Lebanese traders usually entrust their transport business to local drivers, mostly primary school drop-outs. It often happens that these lorry drivers get wealthy enough to buy trucks for themselves before the Lebanese 'bosses' are able to realise the initial cost of vehicles. Cases of embezzlement by persons in highly responsible positions are too common to mention.

The problems created by semi-educated elements have national rather than local dimensions, and there is a low level of trust between the middleman and the financier. The development of local responsibility to promote economic growth is constantly threatened by a resultant constraint on the expansion of local enterprises. Employment opportunities

from foreign commercial agencies are limited to low levels of responsibility, and it is difficult to criticize this policy when greater investment risks are evident. Lebanese enterprises have tended to become close family operations, Indian supermarkets are manned by Indians, while firms like PZ (Patterson Zochonis), CFAO (Compagnie Française de l'Afrique Ouest) and UAC (United Africa Company) have all had to be closed in the last ten years.

The level of literacy of this so-called literate sector is hardly beyond the secondary school stage: the odd drop-out, high school or teacher training college graduate. In politics these are the dangerous 'squealers' of an "Animal Farm" situation. With their limited perspective on national development they become the party political tools for moving the masses to action. They are never too sure of permanent jobs or large incomes and tend to exploit whatever possibility arises for quick financial gains. There is hardly any middle manpower and some of these educated people are absorbed in this class - the central Native Administration Clerk, other chiefdom clerks, mechanics, public works foremen and electrical assistants. University graduates are few and all are working in other parts of the country. By 1972, Bombali could boast of 30 university graduates. Incidentally, the number of graduates from Makeni, the district centre was only half (7) that for Kamakwie (14). Local leadership is far from enlightened. Consequently the small literate sector with all its frailties is the main source of strong leadership.

Local Authorities

The role of local authorities in development has often been given a greater emphasis than that of other sectors of society. The fact is that during early colonial periods, long before the introduction of party politics, the chiefs, apart from being natural rulers were extremely powerful. Their courts had absolute decision powers on most disputes especially those involving land or domestic issues. Their functions as local tribal leaders have been greatly modified since the advent of party politics. They no longer sit in courts as judges. In other words there has been some decentralisation of power in the chiefdom. This policy may have adverse effects on local administration especially as the tendency is common for court presidents to think that they are as important as chiefs. On the other hand the idea goes through in peasant quarters that days of unchallenged domination and exploitation are disappearing. A man can now face a court, put a case through without having to accept unfair verdicts.

Chiefs are currently prone to a conscious-ness of a gradual sapping of authority. Since they still have rights to choose tribal authorities, those selected for local leadership are often close friends sharing common views with chiefs. These are days when no local authority's power is permanent and chiefs are obsessed with this trend. It is probably during this period when a local authority is faced with pleasing central government and the masses that innovation for

for development can be effected. The problems involved are political - local development propaganda usually has political overtones. Anti-government localities can be least enthusiastic about central government efforts at development. Invariably these local authorities hold similar views to their subjects and central governments interpret such an attitude as 'not conducive to good administration'.

The greatest hopes for change in concepts of land tenure and land use rest on local authorities. As rulers over chiefdom sections these local authorities are members of large extended families whose sphere of influence is beyond territories of individual hamlets, or villages. Group organisation for communal as well as government sponsored projects can hardly be effected without their support. With some in-service training and experimentation on large scale farming affecting local leaders, it may be possible to map land properties and modify land tenure practices - a first step towards the recording of individual land rights and rights of land sales. In other words, the channelling of information on agricultural transformation is probably more effective if local authorities are subjected to innovations and their roles in society changed to development authorities. Local authorities have been subjected to party political rather than national consciousness, and where there is no concerted effort at central government level for the provision of development planning and policies, local leadership cannot be expected to appreciate the importance of social change or its responsibility in such change.

Missionaries

Activities of religious groups in Bombali are mainly responsible for most of the educational and medical services in the district. Moreover the introduction of practical hygiene and health services are commendable, not to speak of the development of moral consciousness and character. However, the virtual dominance of religious group control over important services like health and education leads to considerable constraint concerning their distribution in Bombali. The usual competition and conflict between Catholic and Wesleyan Methodist have subtle expressions and stagnating effects. For example, the Wesleyan Methodists have worked in Bombali for a period of 90 years and regard the district as their 'sphere of influence'. The Catholic church was introduced only 15 years ago but today there are more Catholic educational establishments than Wesleyan Methodist.

The main difference in the effect of these religious groups stems from their outlook in the process of developing the human mind. The Wesleyan church came to Bombali with the express desire of winning converts and preparing souls for a healthier and richer heaven. The message spread like wild fire because the peasant who was content with his state of poverty welcomed the feeling that there is wealth in heaven for him. Primary school graduates were lured to undertake biblical studies at the Wesleyan Bible School which was opened some 40 years ago. Graduates of this institution became the local pastors sent to preach in more remote areas.

Secondary schools were introduced as late as the early 1960's, which implies a subjection of the district population either to migrate in search of higher educational facilities or to limited education. The Catholics, on the other hand, won converts from the primary school stage to higher education - secondary schools, teacher training and the university.

The difference in local expansion of religious operations has financial overtones. The Catholics with probably stronger financial support have been more willing to invest heavily in education and health services. Monthly salaries for Wesleyan lay pastors and teachers were as low as £3·50 by 1950. Today the salary of a lay pastor is about £10 a month; but £1 is deducted for tithes and another £1 may be spent on subscriptions. This leaves the pastor with £8 which is just about enough to pay for a bag of clean rice during the rainy season. Charges for health services at all Wesleyan medical establishments are discretionary, but generally far higher than in other health institutions. For Catholics indoctrination is by the white father or sister, and there is no need to employ lay preachers. Teachers' salaries in Catholic schools were higher than those in Wesleyan Methodist schools in the early 1950's. Catholic health services are supported by international agencies like 'Catholic Relief Services Overseas'.

For the local villager free health services from Catholics means that the Roman Catholic church is more helpful.

For the educated worker the Catholics are more appreciated because they do not limit an individual's chances for higher education and income. The idea has hardly been understood that with the Wesleyan Methodists people are taught to help themselves in a harder way. Those who still hope to be wealthy through work in missions have been disappointed and the result is a blindness to efforts at reaching less fortunate individuals in remote places, and a growing hate for some of these agencies.

Local preferences usually favour Catholic establishments even though the aims of all religious agencies are similar. It may be necessary to find means of normalising these preferences, for it often happens that a village head may not permit one mission agency to establish a school or health centre because of a notion discrediting that particular agency, For example it took Catholics a period of five years before local permission was granted for the establishment of Catholic primary schools in Kamakwie and Kamabai. Religious leaders have an important responsibility in guiding local leadership in decision making. Care must be taken that the preservation of religious spheres of influence does not hinder the establishment of essential services.

Traders

A substantial proportion of local and foreign elements in non-farm occupations are engaged in trade. The working population of Bombali amounted to 70,606 in 1963, of which 63,620(90•1%) was occupied in primary activities of farming

and fishing. Sales workers accounted for 3·2% of the working population (2,250) which was lower than the number for craftsmen and labourers (3,065). In Bombali there are various types of people engaged in commerce of various sorts. The Mandingo are mainly in cloth dying and sales. The Fullah are engaged in small shanty shop operations. The Lebanese have larger business concerns than these local traders and their distribution over the district has not been affected by lack of electricity as has that of Indian shops and supermarkets.

A common characteristic of most of these commercial enterprises concerns the predominant one way type of trade involving cash payments for foreign manufactured goods purchased from larger commercial concerns in Freetown. The district does not have a strong form of any production to compensate for local expenditure on manufactured produce. Smaller traders in remote villages operate on credit terms with larger shops in the chiefdom towns. By the time a good reaches the consumer at a village or hamlet it costs three times its original value. The range of goods reaching more rural areas is limited to inexpensive commodities - rubber shoes, prints and cheap cloths fron Hong Kong, copper necklaces, ear rings, sugar, salt, onions and kitchen ware.

The nature of the market in Bombali epitomises rural poverty in an environment where most workers and consumers are engaged in low agricultural productivity. The commercial community in the district can participate in changing pres-

ent levels of cash economies by some participation in agricultural productivity. There are five possible lines of action: a) direct participation in agricultural ventures, b) the provision of credit facilities in cash or capital goods for repayments in cash or kind, c) the stabilisation of farm produce prices, d) the assumption of direct entrepreneural roles between farmer and foreign importer and e) the generation of capital for the establishment of processing facilities for agricultural produce. These suggestions have a common tendency of cumulative advantages of efficiency in business transactions, storage, marketing and credibility. Perhaps the greatest advantage is a probable enhance-ment of the status of farming which has hitherto been regarded as the last resort in the struggle for survival.

In Bombali the most prosperous commercial enterprises are close concerns of Lebanese and Indians who are by law not permitted to engage in the marketing of local farm produce. Before the country achieved independence UAC (United Africa Company) came closest to this role of entrepreneur and investor, for while providing imported goods for local markets it bought agricultural produce - palm kernels, beni-seed, ginger - destined for foreign markets. There is currently no substitute for this function and there is no processing industry. The implication here is that like other parts of the country the economy is a shade below a level of exportation of primary produce for manufactured commodities. The trade monopoly of the Sierra Leone Produce Marketing

Board is being buttressed by local co-operative societies, along with development and co-operative banks. The only farmer co-operative in Bombali involves local farmers with in Makeni.

It is probably too early to assess the effective role of co-operatives, credit banks or even the Produce Marketing Board. The advantage government has from these new institutions concerns a direct feed back effect from national investment to direct operation of marketing and control of returns. Government agencies therefore have a direct contact with farmers, but this sort of relationship modifies the vital element of competition in productivity. This element can best come from a commercial sector able to cope with a larger variety of produce rather than the current limitations involved in select cash crops for foreign markets and rice for local consumption. Government undertakes a responsibility of stabilising prices for select agricultural produce, but is incapable of controlling local price fluctuations of produce destined for local markets. The export oriented farmer benefits from this price stability but the producer for local markets does not and Bombali falls in this category.

Local businessmen are probably at some breaking point between peasant notions and broader perspectives of cash economies. In other words, they are gradually acquiring the ability to save but this level of capital formation is too low to permit diversified investment involving agricultural

and commercial enterprises. The problem here is most likely related to a feeling of risk in long term agricultural investment, the complexity of combining farming and commerce when a trader has not reached a level of sophistication that engages technical and managerial labour; and a possibly limited perspective on attendant economies of scale in situations where traders decide to join forces in local food and commercial ventures. This lack of perspective probably gave birth to the absentee farmer who has enough money to rent government tractor services and hire cheap labour while he runs a business in the larger townships.

Foreign Business Enterprises in Agriculture

Foreign enterprises engaged in trade and agriculture are few in Bombali. There are Lebanese who operate citrus plantations on a small scale and there are manufacturing industries like Sierra Leone Breweries Ltd., and Aureol Tobacco Company, which partly depend on local farm produce. For example the Aureol Tobacco Company has introduced tobacco growing in parts of the Northern Province. Field observations in Bombali indicate that company in-puts in local farms are so high that individual farmer incomes on tobacco are very low. The company supplies technical information through specially trained field officers, it provides fertilisers, seed, nurseries and there is effident supervision in harvesting, leaf fermentation and storage. Individual tobacco farms in Bombali average 0·5 acre, which makes it impossible to think of returns beyond marginal levels.

The problems in tobacco farming are three fold: a) the tobacco company introduced this type of cash crop to a system of shifting cultivation without considering the size of farms, b) it experimented with local farmers for whom tobacco growing is secondary to domestic food production and c) it tolerated shifting practices in tobacco growing. For many tobacco growers in Bombali the tobacco plot is just one of a number of crops destined for local markets - groundnuts, potatoes, cassava or beans. The fertiliser inputs in tobacco plots can be high, but this is a real waste because a fresh plot is usually selected at each growing season. Original farm in-puts have to be applied at every growing season and there is no visible sign of progress. The control of farm sizes by the community as a whole further limits the scope of an individual who plans to put a greater stake in tobacco growing.

Wellington Distilleries Ltd., near Freetown, depends on a large proportion of imported raw materials for its product - malt, sugar, hops, barley. Attempts have been made to refine local drinks and hence reduce the level of dependency on foreign raw materials. For example the company now manufacture drinks like Sierra Leone Power gin and 'Africoco' which are a refinement of distilled palm or bamboo wine ('omole'). The company buys 'omole' from individual producers but the palm wine tapper/distiller as well as the distillery at Wellington can further benefit from some modifications in marketing and production. Local palm wine distillers use imported sugar in making 'omole' which costs 10 pence a pint,

while 'Africoco' or 'Sierra Leone power gin' is five times as expensive. The distilley at Wellington can undertake direct sales of palm or bamboo wine, thereby gaining a monopoly and reducing local competition in sales of gin. Palm wine tapping can then become a more structured and all-season occupation for a sector of the farm population. It can also reduce out-migration especially in a chiefdom like Safroko Limba which breeds the best wine tappers now found in all parts of the country.

A few Lebanese traders own citrus plantations but these are small lots of under 4 acres. Most of these plantations are at some early stage of development, and some are already facing leasing problems. The presence of these small plantation enterprises is most exemplary as some landowners are devoting attention to backyard plantation schemes. Future problems in citrus plantations concern limitations of storage and marketing. Presently there is no fruit processing industry in the country, neither have people tried to export fruit like oranges, grapes or lemons. Certain varieties of pre-season oranges have a special attraction of being green though ripe, but foreign sales have not been tried.

Foreign Aid

External development aid agencies have a limited contribution in Bombali but this limitation is partly connected with government policy in directing development aid. Chinese farmers have helped introduce rice varieties that can be

cultivated two or three times in the year, but this innovation has its limitations. The provision of adequate seed-rice is a major set-back. Another problem concerns the distribution of demonstration farmers. For example the Chinese farmers in Bombali were resident at Makeni and expected to supervise this innovation in the Northern Area. A team of five demonstrators is inadequate for Bombali let alone the Northern Area. The country now receives American Peace Corps volunteers trained as development workers; there were two such workers in Bombali in 1971, stationed at Rogbin and Kamalo. The development worker at Kamalo expressed a reluctance on the part of the farmers to co-operate in experimenting with certain farm practices. His pilot project on poultry had to be abandoned as it encountered problems of local feed shortages and disease.

A few national research reports and feasibility studies by international experts are of relevance to Bombali. While government is generally content with such studies there has been minimal enthusiasm about the implementation of recommendations; even in conditions where the international agency expresses willingness to help. The reasons for this apparent apathy are: a) political instability, b) limitations in capital and personnel requirements, c) problems of integrating new projects with the existing economy and d) land ownership. An Israeli expert reported that there was a strong potential for citrus plantations in Bombali and the Northern Area (1972), the FAO surveyed agricultural potentials for

the bolilands (1969), a detailed study of food marketing in Sierra Leone was effected in 1967 (Mutti) and customary land tenure was studied on behalf of FAO in 1964 (Hussain). These studies are valuable contributions to an understanding of various aspects of development problems and prospects in the country. Present government opinion about such studies is that they are unrealistic if there is no immediate and direct participation in development at the expense of the external agency.

There is, however, one report in which an external agency was willing to help, but government action has been negative. Hussain's study of land tenure projected that within five years the country could have a machinery for land administration and adjudication (1964, 23) and the FAO was ready to provide experts in land tenure, a legal draftsman, a commissioner who would act as land policy adviser and a co-operative expert with knowledge of tribal land tenure and experience of rural reconstruction. It was willing to assist in the collection and compilation of land records, the preparation of land laws, the preparation of plans for cadastral surveys and land registration. These offers have not been given serious consideration even though these bottlenecks have to be resolved before one can talk of agricultural development. The problem here is that those reponsible for land policy making have strong local ethnic ties and are themselves unwilling to accept possible modification of the land tenure system.

The Fullah

The Fullah are the most successful intrusion into indigenous Bombali. Cattle herding and Fullah settlement can no longer be regarded as foreign to Bombali. This herdsman is prone to cultivate cassava, maize and a few vegetables for his family needs. He normally constructs wooden fences around his farm plots and this safeguards crops from destruction by cattle. The peasant farmer with larger acreages can hardly afford fences. The greatest threat to peasant farming concerns the unrestricted movement of cattle in search of pastures. There are no attempts from the Fullah at developing permanent pastures and the harvest and growing seasons are periods of tension between herdsman and peasant. The Fullah have higher incomes through cattle rearing than the peasants whom they cannot appease by providing them with employment.

Suggestions have however beem made at central government level about means of reducing tension between the peasant cultivator and the herdsman. The most popular suggestion concerns the introduction of cattle herder settlement schemes in such areas of tension. Such a scheme was proposed for Koinandugu district in 1965. In 1972, the Ministry of Agriculture proposed another alternative - the establishment of cattle ranching schemes. Possibilities for mixed farming had been studied as early as 1949 but these studies never went beyond a general policy planning stage. While these suggestions are probably the best one can think of , greater

emphasis should have been directed towards the study of human obstacles and methods of facilitating the establishment of these schemes. For example the introduction of settlement schemes cannot be effective without well defined boundaries of land property. The cattle herdsman will have to learn the art of sedentary animal husbandry - permanent pastures and the provision of water supply and fodder for cattle. Emphasis has to be placed on quality rather than number of cattle. More refined methods of tapping by-products like milk, butter and hides may have to be introduced. The peasant farmer will have to accept changes involved in mixed farming. New forms of indebtedness will arise, for example there may be credit schemes for cattle, seed, fertilisers; and the cherished system of bush fallowing will be gradually replaced by the sympathetic guidance of agricultural officers.

Major changes of this nature are dependent on both ecological and social factors within Bombali. For example the selection of areas for permanent settlement of herdsmen must consider levels of population density, the distribution of lowland area more suitable for farming and the establishment of a high level of understanding between the farmer and herdsman. These considerations have not yet been effected in Bombali and the stagnation in rural areas is probably a permanent characteristic describing the conflict between the different forms of peasant land exploitation.

Central Government

The performance of central government in rural development tends to be at variance with its policy for rapid economic growth. This may be due to limited capital resources for the improvement of present rural infrastructures. It may also be a result of political instability since independence. Within eleven years of nationhood there have been five governments, two of which have been army regimes. One party has had a rule of six years in which changes in leadership took place. The present government is about ending a first term of office (five years) which has been marked by local disturbances and a resultant concentration of government expenditure on internal security. The period that is most important to this study (1961-1971) is well defined by the short life-span of district councils which were well established by 1961 and which had been dissolved by 1972.

The essential role of the district councils was to co-ordinate local and central government development efforts. It was thus one important area in which local participation in development planning and implementation was possible. The dissolution of councils in 1972 resulted from problems of management of council finances and the shortage of personnel. Present government aims are towards greater administrative efficiency through a greater centralisation of power at a national level. Within Bombali the main administrative sectors of government are concentrated at Makeni. A few outposts like Kamakwie, Kamabai and Batkanu are sub-stations for

agricultural and veterinary officers. Such a concentration of civil service institutions can have the advantage of minimising the duplication of efforts in development and the ease of co-ordinating individual services in development projects.

There is no establishment to co-ordinate efforts of individual civil service departments which are responsible to higher authorities in Freetown. The central administration is probably undergoing some changes suitable for a planned economy while present economic structures are the result of an unplanned economy. This perhaps explains the current trend of decentralising powers of local governments - chiefs and district councils - while central government powers are becoming more centralised. The response of sectors of society to this new form of administration is beyond the scope of this study, but there are signs of uncertainty in Bombali concerning rapid social changes. Local attitudes can hardly be modified to facilitate development without an atmosphere of internal stability.

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CHAPTER VIII

DEVELOPMENT INCENTIVES FOR BOMBALI

INTRODUCTION

The study of underdevelopment in Bombali cannot be complete without suggestions of suitable incentives for economic change. Agriculture remains the most important source of income for a greater part of the working population. This sector of the gainfully occupied population is characterised by low incomes, mass illiteracy, traditionalism and relative isolation. These are economic and cultural obstacles for which short term solutions are not available. Problems of understanding environments with a preponderance of traditional farmers are further obstacles to development planning and implementation.

De Wilde aptly observed that the experience of several workers in development planning has been one of success and failure, arising from an inadequate understanding of the total environment in which development must take place (1967, 25). The study of underdevelopment in Bombali cannot claim a high level of understanding considering the fact that studies of this nature are a novelty in Sierra Leone. Also the inaccessibility of data on previous district expenditures and estimates deprives this study of an important index of the distribution of government investment at the chiefdom level. With the absence of detailed land capability data this study barely satisfies a primary level of feasibility studies for Bombali. Despite these limitations the study

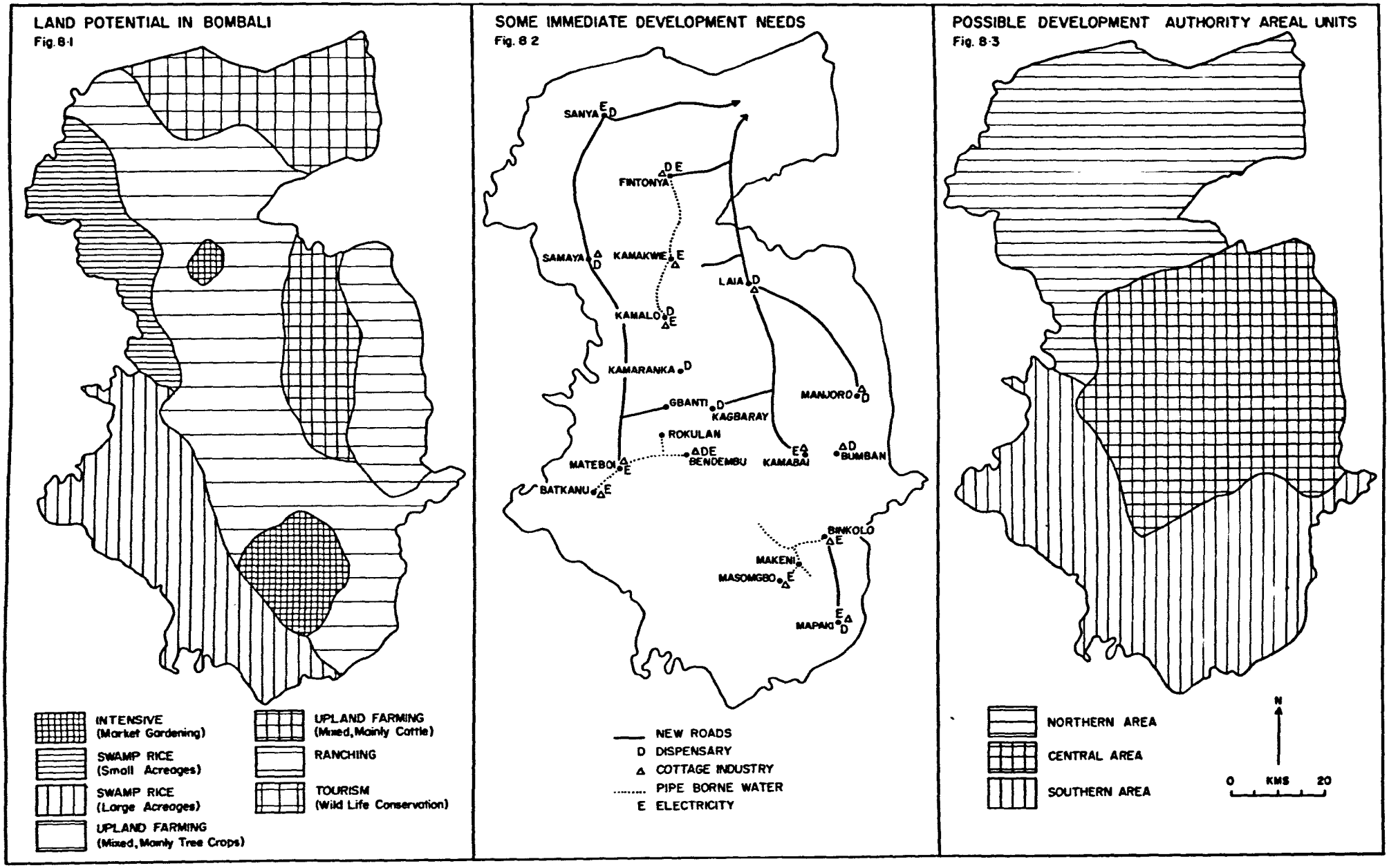
provides some indication of the depth from which suggestions can be made for development planning. The dangers of applying techniques and ideas suitable for economic systems that are foreign to Bombali are recognised; and an attempt is made to find innovations that can be adjusted to the present system of administration and land exploitation.

There is the tendency to reduce all subsistence systems to a pre-take-off stage in economic models which do not find variations at this level. In Bombali the economic system is at the lowest level of a pre-take-off stage where growth poles have not been fully developed. There is also a tendency to defend the essence of real third world situations by different interpretations of present day economic theory. For example, Abercrombie observed that although subsistence farmers have a low standard of living and are more liable to periodic food shortages than those who buy and sell on the market, there is an apparent stability and security in the subsistence economy that contrasts sharply with the fluctuations of the money economy (1966,10). Factors of stability and security are largely associated with no real advantage other than the conservation of traditional society - a closed system implicit in de Wilde's description of African farmers:

> "African farmers are caught in a vicious circle, for the inadequacies of the market prevent them from raising their output through specialisation while their own desire for security inhibits the growth of the market" (1967,22).

In other words, inherent values of stagnating economies are not necessarily an advantage to processes of economic change. The problems one faces in subsistence economies are probably best resolved by some form of compromise with conditions necessary for economic growth. Such a compromise must be localised to suit a given environment. This condition tends to be implied in Makings' study of agricultural problems of developing countries in Africa (1967). In this study right holder tenure is suggested as a basis for structural change. Makings envisaged a transitional stage from right holder tenure during which three conditions are suggested: a) an acceptability of change to those with an interest in land, b) the change should facilitate rather than impede agricultural development and c) it should be reasonably capable of administrative control (21). The basis for change is flexibility but this implies a general consciousness of the need for change and the availability of an administrative system that can control the process of change. These implications are not satisfied in Bombali because people are conscious of the fact that present obstacles to economic growth in Sierra Leone are more commonly found in rural areas.

Efforts of governments in accelerating economic growth have presently little impact on rural areas. For example road surfacing schemes tend to have greater impact on urban expansion. Beyond a few provincial towns, development tends to be concentrated in productive areas for export-oriented cash crops. Two attractive areas in Bombali are the bolilands


LAND POTENTIAL IN BOMBALI
Fig. 8·1
INTENSIVE (Market Gardening)
SWAMP RICE (Small Acreages)
SWAMP RICE (Large Acreages)
UPLAND FARMING (Mixed, Mainly Tree Crops)
UPLAND FARMING (Mixed, Mainly Cattle)
RANCHING
TOURISM (Wild Life Conservation)
SOME IMMEDIATE DEVELOPMENT NEEDS
Fig. 8·2
SANYA
FINTONYA
SAMAYA
KAMAKWIE
LAIA
KAMALO
KAMARANKA
GBANTI
KAGBARAY
MANJORO
ROKULAN
MATEBOI
BENDEMBU
KAMABAI
BUMBAN
BATKANU
BINKOLO
MAKENI
MASOMGBO
MAPAKI
NEW ROADS
D DISPENSARY
△ COTTAGE INDUSTRY
..... PIPE BORNE WATER
E ELECTRICITY
POSSIBLE DEVELOPMENT AUTHORITY AREAL UNITS
Fig. 8·3
NORTHERN AREA
CENTRAL AREA
SOUTHERN AREA
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and the township of Makeni, the bolilands being a productive area for swamp rice while Makeni is the regional centre for the Northern Area. Both are located, however, in the far south of the district (Chapter V).

As the country is presently being run with no development plan, local studies of this nature may provide clues to the identification of underdevelopment. Development incentives suggested for the district are based on present organisational structures and human problems. There is evidence of local variations in the infrastructure, which provides an index to priority areas for future development projects (Chapter V).

THE DETERMINATION OF DEVELOPMENT AUTHORITY AREAS

Suggested development authority areas are based on the district's land potential (Fig. 8.1) and immediate development needs (Fig. 8.2). Intensive market gardening is fast developing around townships like Makeni, and Kamakwie. The bolilands to the north are more densely populated than those to the south. Swamp acreages to the north are consequently smaller. Mixed farming with greater emphasis on tree crop cultivation is suggested for the central uplands. East of this north/south belt are: a) Eastern Tambakha where relief and forest preserve some wildlife attraction for tourists, b) Western Biriwa, a possible area for mixed farming with some emphasis on cattle rearing and c) Eastern Biriwa which is more suitable for ranching.

More immediate development needs include the construction of major trunk roads parallel to the main communication routes and the establishment of cottage industries (local crafts) at villages along these routes (Fig. 8.2). Tambakha chiefdom may need dispensaries at Samaya, Fintonya and Sanya. To the south, villages like Laia, Kamalo, Kamaranka, Kagbaray and Mapaki need health centres. While more remote settlements may still depend on streams and wells villages along pipe line routes can be supplied with treated water (Fig.8.2).

The district can be divided into three development authority areas (Fig. 8.3). The northern area includes the whole of Tambakha and Sella Limba, and parts of Sanda Lokko and Tenraren chiefdoms. Kamakwie is the central service town for a possible tourist industry further north, small scale swamp cultivation to the east, and upland farming to the west.

The central area is mainly a west to east transition from tree crop cultivation to ranching. The possibility of denser road networks is greater as none of the larger villages - Manjoro, Kamabai, Bendembu or Kagbaray, is centrally located with respect to this development area. South-eastern and western Bombali are included with the more developed south where Makeni is an effident service centre for these sectors. These suggested development areas have taken into account the need for: a) greater tribal admixture, b) a more complex transportation network and c) some form of specialisation in primary productivity.

DEVELOPMENT INCENTIVES

In a district where nine tenths of the population are engaged in farming, the greatest task for development planners concerns the classification of sources of income. This involves the provision of some gradual means of releasing labour from farming to secondary and tertiary occupations. The development of local consciousness concerning the need to improve standards of living is an important motivating force in the process of releasing labour from the agricultural sector. It is this force that can generate the necessary social change to enable economic change to take place. The assumption in economic change for Bombali implies a more diversified and intensive use of local manpower in the definition, formulation and implementation of local development plans. One assumes a greater participation of the public sector to a level where some form of integration is visible between commercial and agricultural enterprises. In other words emphasis must be placed on the direction of the total community towards increased productivity and incomes.

This can hardly be achieved by an initial increase in prices for agricultural products and subsequent price stabilisation in an area where farm produce mainly caters for domestic markets. There is a tendency for people to grow their own food requirements when prices rise. This simply contracts the local market and reduces productivity and incomes. The domestic market can be improved by an increase in demand for agricultural produce while the purchasing

power of the non-farm population is assured by other sources of income.

Perhaps one of the greatest obstacles in development planning concerns the time factor in expectations of results from implemented plans. There is the tendency to explain failure through local apathy on the part of the public. One vital lesson hardly appreciated relates to the long and hard process of saving and capital formation. The supply of capital to people that have not undergone a process of capital formation is no efficient solution; neither is the introduction of sophisticated manufacturing industries. The problem concerns the provision of jobs such that incomes are commensurate with effort - the type of earning that is less lavishly spent. With regular incomes and steady increases in wages the tendency for individual planning for the future is greater than with irregular returns from farm work. The limitation in Bombali is due to mass illiteracy and the incentives suggested appreciate this obstacle.

Incentives suggested for Bombali may have long and short term returns. Most services related to infrastructural needs have long term returns and involve heavy capital investment - educational institutions, health services, water supply and better roads (Fig. 8.2). Such priorities may absorb manual labour but jobs will be of a temporary nature. Emphasis must therefore be placed on priorities of short term returns which can assure more permanent sources of income and effective outlets for the farm population. The sort of incentives

suggested for Bombali are such that maximised participation of the local people is necessary in both planning and the plan implementation. These include: a) mass education, b) the designation of rural development areas and authorities (Fig. 8.3), c) the encouragement of less shifting practices in farming and animal husbandry, d) the demarcation of group or family land property within local development areas, e) the introduction of a taxation scheme for land holding beyond a state-legislated acreage per individual, family or group, f) the introduction of large-scale farming capable of justifying the need for larger farm operations by accepting the responsibility of taxation, g) the encouragement of small scale (cottage) industries, h) the establishment of self-help projects and i) the creation of a District Development Authority to supervide local rural development authorities.

Plans for mass education should involve adult education, the diffusion of information related to family planning, government policy in agricultural development, basic principles of agricultural economics and an introduction to methods of farm organisation. The introduction of local development authorities should modify the role of the section chief and village head which has hitherto been political. Such local leadership must be directed towards actual participation in systematic planning in land exploitation. Properly utilized, local leadership can help clarify local patterns of land holding and current rights; the demarcation and delimitation of group property can be more accurately carried out.

The encouragement of farmers to adopt less shifting practices in farming and animal husbandry is an important incentive. Provision must be made, however, for subsidies like money payments, supplies of seed, fertilisers and constant supervision. Similarly, self-help projects should be subsidised by token payments for community work. The district development authority will supervise all development projects and co-ordinate civil service operations in Bombali. This will modify the current anomaly of status between the agricultural and district officer. Long and short term incentives will then have a tendency to dove-tail with each other. The feeling will be created that local people are helping to build their community which is part of the national community and the world at large.

INCENTIVES WITH LONG TERM RETURNS

There are five principal development needs with long term returns in Bombali - communications, water supply, health, education and electricity supply. The present patterns of communications largely result in low levels of economic productivity, the dispersed nature of settlement and difficulties of access to more prosperous parts of the country. The importance of chiefdom administrative centres as service locations is emphasised in the transportation network. Two main types of roads have tended to evolve - a) feeder roads which converge on b) interchiefdom town roads. The main focus of feeder roads is presently towards chiefdom towns. These roads are yet very few in Bombali, consequently hinter-

lands have limited access to main roads and administrative centres, most of which are stagnating.

Feeder Roads

Physiographic characteristics of the district present some problems in feeder road construction. For example parts of the low land areas to the south west of Bombali are under seasonal floods; the north eastern uplands are associated with steep slopes and rock outcrops along a northwest to south east axis. The construction of roads within such a diverse topography can be more cheaply done through self-help projects. Present feeder roads in the district have been constructed with community labour under the supervision of chiefs and village headmen. Current methods of implementing local road construction projects in Bombali tend to exploit village labour and people are increasingly disinterested in such projects.

The chief normally asks villagers to construct roads to link their village or settlement with the main road. He supervises the work and provides food for the labourers while at work. The chief is compensated from district funds for this type of initiative. Villagers are aware of this gesture but reserve their dissatisfaction at not receiving part of this compensation. A more reasonable method of channelling this compensation can be devised. There should be some preliminary meeting of the district development authority with the chief and local development area representatives. The proposal for feeder road construction can then be discussed.

The road engineer can then suggest possible help like surveying, bridge construction and road levelling. The district officer offers some financial help as an inducement to village labour while the chief and local development authority are asked to organise the work and distribute the money to all workers. By this open discussion with local people no participant in the project is uninformed about motives for requesting local help.

Formal Education

Most of the primary schools in the district are located along some line of communication but larger settlements have attracted more of these establishments. There is need to control the location of essential services like education especially at primary level. As new feeder roads emerge, hinterland locations must be given priority in the future. Government's present objective is to achieve a 50% level of literacy in the country by 1980. The most effective level for rapid change is at the primary school age. There is need for a survey of the distribution of persons of this lower age that are not attending schools. Government would have to consider four possible measures if it hopes to raise the level of literacy in Bombali from 2% to 50% within a period of ten years. These measures include: a) the establishment of primary schools in remote villages with large proportions of persons of primary school age, b) the abolition of primary school fees, at least in remote areas, c) the introduction of compulsory primary education and d) the expansion of mass

education programmes. These suggestions imply greater demands for teachers, more expenditure on wages and school construction and more detailed assessments of local variations of literacy levels. As the establishment of schools will heavily depend on the rate at which road construction is taking place overhead costs will be subject to similar growth rates. Government may be inclined to increase local taxation and such a move can be acceptable because of one understandable cause - mass education.

There are presently five secondary schools in the district, three are located at Makeni. It may be necessary to to establish one more school at Bendembu to resolve one cause of out-migration in an area of considerable accessibility. If the assumption is made that six secondary schools can serve Bombali very adequately then the problem of out-migration for secondary education may not be important. Observations in Bombali however show that government controlled schools and mission establishments with a long history of academic achievements are more attractive to parents as well as children. The oldest secondary school in Bombali has had only ten academic sessions and the drift to other secondary schools in the country continues. It may be necessary for government to review its policy on education especially with regard to the efficiency of high schools. In other words, secondary schools in the district should be attractive enough to serve the needs of the people. Excluding high transport costs, there are socio-economic problems

arising from reduced parental control over children. Extra costs are involved in the provision of clothing, text books, pocket money - expenditure which can be reduced if a school were not too far from home.

Water Supply

The provision of water supply for domestic use must be given a high priority in future planning for Bombali. There are only four settlements with treated pipe-borne water supply in the district - Makeni, Kamakwie, Batkanu and Mateboi. Improvements in sources of good drinking water can be achieved through combined efforts of the government and local communities. There is a need to educate people on the dangers of drinking water from stagnant ponds, and to protect sources of drinking water against other uses like washing clothes, pollution from cattle and wild animals as well as dead vegetation. One cheap alternative to pipe-borne water is well water. Villagers can be encouraged to dig wells which can be fitted with hand driven pumps. Occasional shortages of water can take place as the water level fluctuates seasonally, but this can be resolved by silt clearing and further deepening. Left with some local communities, the need for this type of water is known but this is not important with other sources around. As in the case of roads, the local development authority has to organise community labour while government provides technical advice and hand operated pumps.

Health Services

Health services are fairly well distributed in Bombali, but the fact remains that some chiefdoms have no dispensaries, (Fig. 5.11) and that the number of persons per medical doctor is far above the national average (Chapter V). With only two general hospitals there is need for more dispensing centres. There is also need for a diversification of dispensary services. Hitherto, these small health centres treated only minor ailments, ulcers, worms, malaria and coughs. Vaccinations and minor operations could be introduced in such situations where qualified dispensers are available. Chiefdoms like Gbanti Kamaranka and Tambakha, with no health services should be given priority in future health service locations.

Much of the task of reaching remote areas is resolved through the efforts of missionary health services. Prices levied for medicines are arbitrary decisions of missionaries and some people are often too poor to afford the luxury of modern medication. At present there is no national health scheme and central government is faced with the responsibility of providing health services and supplementing mission hospitals with little returns from consumers. An increase in small health units may have some important effects in reducing mortality by checking the spread of contageous diseases and by greater exposure of modern medicine to environments where the witch doctor still has a great impact. The health officer has to work with the social welfare officer in an effort to explain the importance of practical hygiene - the

need for good water supply, the treatment of pit latrines often too close to the house and kitchen, the maintenance of clean villages, diet and hygiene practices in food preparation.

Electricity

The introduction of electricity supply in some larger settlements in Bombali is overdue. Presently only Makeni has electricity supply. There is no better index of the variation in living standards than the location of centres with electricity supply. The businessman or truck driver knows the difference between Makeni and other settlements in Bombali; the difference between Makeni and other districts where more towns are now supplied with electricity, or the difference between Bombali and the Freetown area. The impression people have is that Bombali, like other northern districts has been neglected, and governments which have given deaf ears to this fact have had little support from this part of the country. The problem however is related to government policy in introducing a national electricity corporation rather than an unwillingness to provide this service.

The electricity corporation is meant to operate on an essentially commercial basis. It cannot supply settlements where returns hardly resolve costs of establishing and maintaining an electricity plant. Excluding Makeni, only Kamakwie has a population of about 4,000 inhabitants. Other chiefdom settlements are far below a population of 2,000. Certain development in-puts like electricity, education or health

should not be expected to resolve initial costs of their establishment. It may be necessary for government to modify its policies so that the electricity corporation functions as any other public infrastructural need while expecting greater returns from increasing use of electricity. In other words the commercial outlook of electricity services must be modified to tolerate situations where long term returns can be favourable.

SHORT TERM INCENTIVES

Mass Education

Mass education remains the most effective incentive assuring short term returns in rural development. Much however depends upon a definition of objectives suitable for Bombali. Mass education in this district should involve adult education, the dissemination of information on family planning, village planning, and organisation, simple farm economies and discussions on government policy on agricultural development. These objectives can be achieved more efficiently by combined efforts of all sectors of the civil service. While thse objectives bring the civil servant into grips with the local communities, they also speed up the process of growth in individual motivation among peasants.

One great attraction to any villager concerns the offer of an opportunity to learn how to read and write. Literacy classes can be organised with the help of village teachers and pupils in the upper classes of primary schools. Once the

classes start, films on farming techniques can be introduced as well as the occasional discussion on family planning, child care and village organisation. As time progresses more sensitive topics can be discussd - water supply for the village, maintenance of pit latrines, the road from the village to the main motor road and the division of farm land. Discussions of this nature are meant to provide the teacher or field officer with some idea about individual attitudes to change. The literacy classes provide a forum where male and female members of the village can bury some of their prejudices and discuss topics of common interest. Graduates from such literacy classes can be deployed to other villages and paid as village development assistants. The motivation for social change will then spread at minimal cost.

Creation of Local Development Areas

The designation of local development areas should come after the introduction of mass education programmes. The local development authority should be concerned with the demarcation of group or family land holdings. It should help in devising methods of modifying shifting practices in farming and implementing necessary changes towards more intensive agricultural land use. Two types of farm operation are suggested: a) group farming or b) individual farm operation. In either case the development officer collaborates with agricultural assistants in finding what type of help is needed or suggested by farmers - tractor services, fertilisers, seeds. In other words, while solutions of peasant problems can be known by the master farmer, individual local cultivators must be given the opport-

unity to discover and express their priorities in the improvement of farm operations.

While this level of freedom is permitted for the discovery of a need to change, more co-operative members of the community should be encouraged by money compensations, ploughing services and seed supplies. As the farmer changes his farm techniques, he tends to realise a steady increase in farm incomes and starts thinking of plantations and large-scale farming. The greatest bottleneck in peasant farming concerns the labour involved in upland farming and woodland clearing. The hoe and machete are more adjusted to bush exploitation in a shifting system. A critical point in land management is related to soil maintenance so that yields do not fall at drastic rates. The problem for the development officer is two-fold: a) he may decide to offer ploughing services to people opting for less shifting and more intensive cultivation, and b) he has to convince the peasant that yields can be improved without having cause to shift.

In a situation where the tractor innovator is not sure of any bad effect of replacing the hoe, other problems may emerge. The traditional hoe is likely to be more adjusted to farming in areas of thin top soils. In such areas thin top soils are barely overturned to offer shoots of plants some initial easy stage of boring through increasingly infertile layers of subsoils. Erosion is checked by quick growth of grasses and tree stumps quickly develope branches to protect

the exposed soils. A tractor which takes over such a ploughing job must be fitted with ploughs of very shallow digging capacity. In areas of steeper slopes the hoe has no special advantages of checking erosion and these should form the tree crop areas of cultivation. The main area of competition between the hoe and tractor is on swampland and flat upland (Fig. 8.1).

Government must in any case help in reducing the volume of farm labour if it hopes to achieve any success in modifying land use practices. The tractor is perhaps the easiest answer; but farmers must be acquainted with techniques of land management, uses of chemical fertilisers, compost heaps and mixed farming methods. Animal husbandry may have to be introduced together with more systematic methods of crop rotation. If the government can help somehow in reducing farm labour it will win the peasant's confidence concerning policies in agricultural development. Farm acreages will increase, farm practices will be more adjusted to demands of large-scale farming, individual land hold rights will evolve as well as land taxation.

Land Taxation

Land taxation at this stage should only affect farms above state legislated sizes per family or group operator. Individuals who are reluctant to surrender excess land holding rights will tend to lease land to more ambitious farmers to pay land taxes. Some may combine efforts to produce on a large scale and resolve taxes. The Fullah herdsman may then

be offered an opportunity to own or lease land for cattle grazing and farming. On the other hand grazing land may be exchanged for cattle so that both peasant cultivator and herdsman have an opportunity to start mixed farming without incurring much expenditure. There are numerous advantages in land taxation at this level: a) land taxes can be transferred to local development funds to provide part of the cost of development projects, b) taxation of excess land creates some incentive for increased productivity and c) it will provide the most acceptable form of land reform for traditional farmers, since they do not lose their rights to land and still have the privilege of leasing taxable holdings.

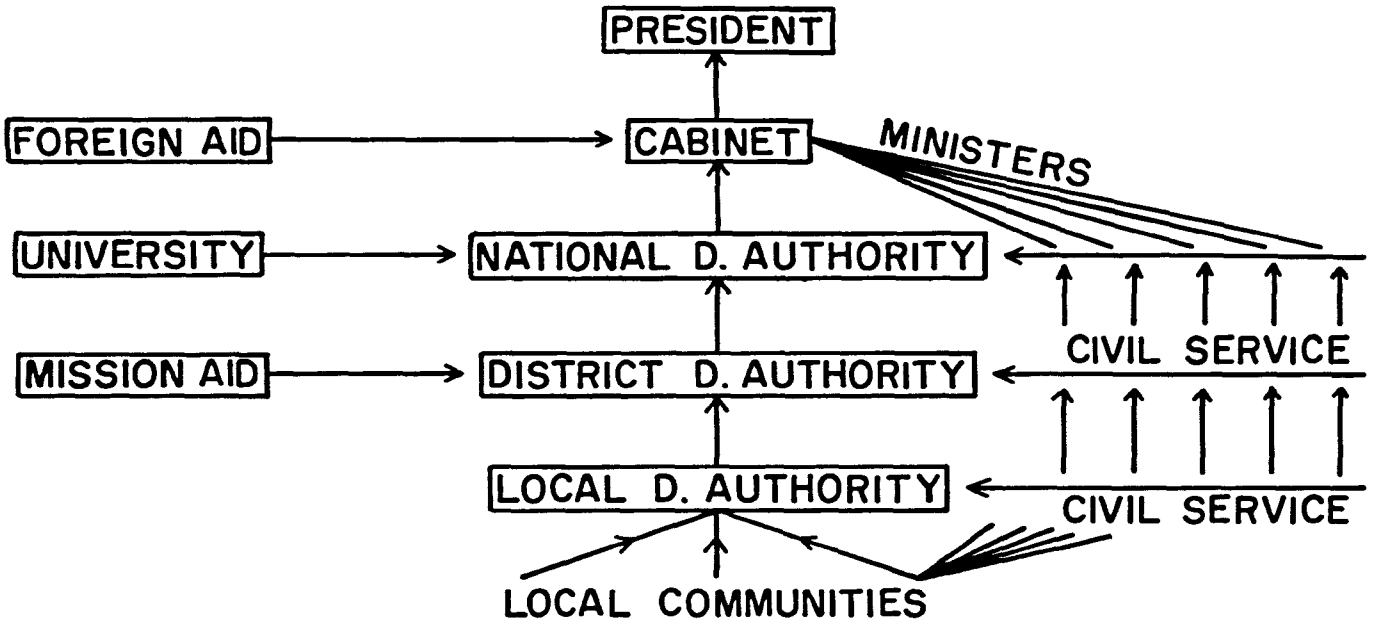
The main incentive for increased agricultural productivity is not only a matter of providing legislation on land rights. It is also related to some adjustment between the implementation of policy and the growing level of the peasant's confidence of government motives in changing land hold rights. In Bombali there appears to be no better method for such a change other than a gradual participation of government in peasant farm operations. The complex nature of land transfer in peasantry is better understood by the administration. Land capabilities will be known, limitations of the infrastructure will be felt by decision makers and the peasants can be more assured of other sources of social security. For government, the emphasis must be on a sympathetic attitude towards the peasant at this transitional stage.

Other sources of social security may have various expressions, but this study suggests five main trends resulting from legislation on land hold rights: a) large scale farming will be introduced in Bombali, b) agriculture will be integrated to commercial enterprises, c) less labour will be required in mechanised farming and d) this surplus labour will be absorbed in services and processing while e) greater demands on agricultural produce will spell an increase in incomes. As land presently functions as the main index of social security other sources of security must be created to reduce its overwhelming importance. Land itself is of little consequence if it is not developed. Education can help in reducing the number of people engaged in farming, but it takes long periods of time for it to have much impact on modifying the present system of land tenure. The productive capacity of the peasant can be improved and this must take place before a capital formation level can be reached.

Cottage Industries

It is likely to be at the level when agriculture starts losing its labour force that small scale industries are best introduced. The assumption here is that not all farm labour may be absorbed in tertiary occupations, let alone processing and modern manufacturing industries which may still not be present in the district. The economies of scale in local or cottage industries are immense and there are commercial possibilities in domestic and international markets. For example the cloth dying industry ('gara') in the district can be efficiently structured to produce goods that attract

Fig 8·4 A Diagrammatic Representation of Development Authorities



tourists. This may entail some large organisation investing in local dyes, standardised patterns, cloth processing, sewing of garments and marketing. Wood and ivory carving can be structured to similar standards of organisation.

Local industries of this nature may provide the required capital for improving production skills at a manufacturing level, the purchase of cloths and management training. Local ivory and hardwoods (mahogany) are obtainable in the district. Also there are local dyes like roots, backs of mango stems and kola nuts, while beeswax can be used in place of candle sticks. Carving and cloth dying are labour intensive industries which should absorb a considerable amount of the population engaged in agriculture. Some central marketing agency will be needed to stabilize price fluctuations of products which are currently purchased by individuals bargaining with small producers.

Local Development Authorities.

One of the most important conditions for social change in Bombali concerns the provision of an administration that can spearhead development incentives. This study suggests the creation of a district development authority which should co-ordinate all civil service efforts at rural development. This authority should supervise development projects and regulate the speed at which plan implementation progresses. Such an authority should be directly responsible to a national development authority which is in turn responsible to the cabinet (Fig. 8.4). The national develop-

ment authority will be responsible for certifying the feasibility of development projects and for recommending district development plans to central government for national or international aid.

The district development authority may, for purposes of efficiency, designate sub-development authorities with the responsibility of defining development needs, running of projects and making progress reports. The administrative hierarchy suggested here ranges from local to national development authorities with a representation of all sectors of society. At no level should indigenous members of the development area be excluded from planning and plan implementation. At the local development area level the community must be given an ample opportunity of making decisions. Representatives of these local groups attend district development authority meetings with chiefs who will be co-opted.

Sub-development areas (local development authorities) may cut across chiefdom boundaries especially in areas of homogeneous physiography. The district development authority, rather than chiefs, will be responsible for resolving problems of inter-chiefdom boundaries. It may not be necessary to create chiefdom development authorities because chances of social (tribal) friction are greater. More responsibility on local land development is thus transferred to individual groups claiming rights of freehold. The present lease system in which a chief receives one third of the income from leases

will be revised so that land holders have a higher share. Thus while land owners may have better incomes from leases they face a responsibility of limited ownership or taxation on excess land holding. Changes in land use practices will modify present clannish or tribal associations which are a hindrance to large scale farming. The modified role of chiefs in this thorny question of land ownership should be a safeguard against harrassment of traditional authority. On the other hand, the responsibility of changing the social structures is rooted in the local communities.

The civil service is not modified by any means. By creating development areas and authorities below a chiefdom level the provision is made for closer contact of politicians, civil servants and local communities in development. At the district level, members of the development authority could include a legal expert, a road engineer, an agricultural economist, health, social welfare and district officers(Fig. 8.4). Progress reports on local development projects would be prepared by field officers representing all the relevant sectors of the civil service rather than isolated reports. This will save duplication of activities and reduce the presently rigid compartmentalisation of civil service departments.

The role of the university in development is primarily one of personnel training, research, project study and experimentation. It should be able to provide adaptations of innovations to suit local environments. Like civil service departments the utility of the university can be maximised

by the establishment of development areas. The national development authority will have access to university research on underdevelopment. It will employ university services in feasibility studies of local development projects. There should be some combination of local and foreign based consultant reports. The indigenous expert can then share the experiences of external profeesionals, while the latter become better informed about local environments and possible modifications of projects to suit local community aspirations.

DETERRENTS TO CHANGES IN ORGANISATIONAL STRUCTURES

Present obstacles to development mainly stem from government policy on agricultural development. While efforts are being made to increase productivity there is no means by which the success or failure of current innovations can be ascertained. Also, if the sole aim of agricultural development is for increased productivity then this can be achieved without effecting great social changes among peasants in communities in Bombali. For example the introduction of the tractor rental scheme has benefitted the absentee farmer and richer people more than poorer and more traditional farmers.

The establishment of the rice corporation as a marketing agency for this crop is an example of weak organisation on the part of government. The tractor rental scheme is currently supervised by the Ministry of Agriculture which demands cash payments for ploughing services. The rice corporation has a monopoly to buy and resell local and imported rice. It

is also responsible for fixing local prices. There thus seems to be little distinction between the Ministry as a service and the corporation which is essentially a commercial establishment. In other words, the control of consumer prices can be more efficiently achieved by the rice corporation if it had more control over factors of increased productivity. This can be achieved by a transfer of the tractor rental scheme to the rice corporation which would be advised to devise more suitable means of payments for agricultural services of this nature. For example a farmer interested in the tractor scheme but who has no money can be helped and asked to pay in kind or cash during harvests. This measure could help the corporation in checking the growing number of absentee farmers who are deeply involved in the rice trade.

The provision of capital for local development projects is a heavy responsibility for government. Assurances for the viability of projects must therefore be based on detailed studies which could suggest local sources of capital to supplement direct government investment. The dependence on foreign aid is a bottleneck to local development, and governments in Sierra Leone have not yet been able to devise a policy that channels profits from agricultural trade to this type of development. Presently about 70% of the expenditure on national development is derived from external loans and aid - The World Bank, the International Monetary Fund, the Federal Republic of Germany and Great Britain (Crown Agents). These loans are mainly for principal highway construction.

Successive governments have tended to regard these loans and effective changes as a credit to their administration.

For example under the French government loan scheme three townships have been provided with pipe-borne water within a period of seven years. A loan from the Federal Republic of Germany for road construction between Lunsar and Makeni brought 14 miles of metalled road to Bombali. The government may have to find local sources of income for rural development in the district. For example some increase in local head taxation can be regarded as reasonable if government decides to abolish primary school fees. Female taxation may reduce the size of the family and the polygamous nature of some family units. Land taxation can be another important source of income while the Produce Marketing Board and the Rice Corporation may be reorganised to assume some responsibility in financing development projects.

The rate at which development will take place in Bombali is bound to be very slow. The fact that governments of independent Sierra Leone have never implemented any development plan leaves one with no yardstick of economic change. The general political instability during the last eleven years offers little optimism for rapid changes in human attitudes towards economic development. Current government efforts at increased agricultural productivity may only achieve a surplus in foreign trade to resolve expenditure on imported food supplements. The problem of providing capital for local development must be viewed in the light of these observations.

One advantage Bombali has in future development planning relates to the possibility of incorporating local communities at this level. Chiefdom boundaries can hardly be modified neither can the role of chiefs be changed without internal unrest. The involvement of local people in rural development seems the most reasonable approach to social and economic change. As people become aware of the need for development it becomes easier for modifications of traditional institutions to be effected.

The choice of areas to establish innovations for social change will depend on the current location of the larger settlements - the chiefdom towns. At an interchiefdom level priority must be given to administrative areas with the most development problems. For example problems of communication and literacy are more accentuated in chiefdoms like Magbaimba, Biriwa, Tambakha and Paki Masabong. These are special cases which deserve priority considerations in future planning. Variations in the size of chiefdoms can have little effect on local development provided community participation is assured and that local administrative boundaries are non-demarcators of development areas.

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CONCLUSION

THE DILEMMA IN UNDERDEVELOPMENT STUDIES

The dilemma in underdevelopment studies concerns paucity of data. With the availability of funds and specialists, physical characteristics of underdeveloped environments can more easily be known than the nature of traditional, tribal, rural man. Underdevelopment cannot be studied without an assessment of human obstacles to economic change. This, however is one of the most difficult aspects to quantify and forecast; and the geographer tends to be less capable of objective generalisations without figures. This problem has been given enough consideration and the geography of underdevelopment may have to accept this possible weakness until the developing world is capable of facing objective criticism and more willing to participate in the search for the nature of underdevelopment.

THE PRESENT

Bombali as most parts of Northern Sierra Leone is of secondary priority in national development. Presently there are no known mineral resources for economic exploitation. There is little cash crop cultivation for an export market. The agricultural productive capacity of the district contends with unfavourable domestic market forces - the relative isolation of Bombali, the presence of large proportions of farmers in gainfully occupied sectors of other districts, family sizes, concepts of cash economies, traditionalism and low prices for food products. There is need to consider

the implementation of suggested incentives for development, especially those concerned with mass education, land rights, communications and the restructuring of the civil service. As a producer of domestic food requirements the district's contribution to national economic growth can mean the reduction of the country's dependence on imported food.

THE FUTURE

Problems on land rights and land use competition will continue to hinder changes in land exploitation. There are probably no short-term solutions to land holding problems. There is the conflict between the Fullah herdsman and the shifting cultivator. A probably more explosive problem concerns the difference in land laws between the Western Area - the proletariat sector of the country - and the provinces. There are institutional differences that go a long way in splitting the country into factions and this saps national consciousness among those who should diffuse this vital element in nation building.

A current testimony of the acting Fullah tribal headman in Freetown on current beef shortages in Sierra Leone is an important forecast of future land problems. The testimony is quoted in a recent publication of "West Africa", in which the chief explains:

> "One of the reasons for scarcity of meat was the exodus of herdsmen and cattle from grazing to barren areas because of molestation and heavy fines levied...

> by local administration authorities... another reason was cruelty to cattle "(West Africa, 1972, 1706).

Further the chief cited an instance when over 600 cows were slaughtered by angry people who claimed that herdsmen had encroached on farms and destroyed plants. Consequently, cattle rearers ran from chiefdom to chiefdom as their cattle were being macheted by farmers.

The problem of land rights is probably more deep rooted than one can imagine. Fullah herdsmen are permanently settled in the district and the best compromise should appease both cultivator and cattle rearer. There were about 65,250 cattle in Bombali out of an estimated 191,378 for the Northern Area in 1968. In other words nearly one third of the cattle in the north are found in Bombali. Considering the national total of 204,855 cattle (CSO, 1968) Bombali accounted for over one fourth of this total. The land problem is therefore a national dilemma and it is unfortunate that local administrative authorities who belong to farming communities are still entirely responsible for decisions on land use conflicts.

UNDERDEVELOPMENT IN BOMBALI

Underdevelopment can be explained in terms of characteristics of a defined geographical area in which the exploitation of resources is far from maximised. Neither the human nor physical environment is capable of improvement without major political, social and economic modifications. Such local changes must be flexible enough to fit into national plans and established institutions for economic change. The

development incentives suggested for the district are intended to bridge the gap between sophisticated establishments serving modern cash economies on the one hand, and peasant economies on the other. Similarly planning for the district can be more efficiently carried out by considering other administrative areas around it. For example it has been observed that larger settlements in the district are not situated at most central locations. Service areas of these centres probably cut across administrative boundaries, competing with settlements of similar size in the country. Future distributions of services must contend with this problem while attempts are made at normalising inequalities at chiefdom levels.

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APPENDIX 2.1

Questionnaire on basis of land inheritance.

Code

A. Head of Family's Tribe.

B. Origin of Land Claims 1. Bought 2. Father 3. Mother 4. Wife's Parents 5. Chief 6. Casual settlement 7. Gift.

C. Tribe/s of Wife/Wives.

1. A.

B. 1, 2, 3, 4, 5, 6, 7.

C. 1 _____ 2_____ 3_____ 4_____ 5_____

2. A.

B.

C.

3. A.

B.

C.

4. A.

B.

C.

5. A.

B.

C.

6. A.

B.

C.

Appendix 5.1. Service Scores by Settlement with a Population of 450 and over.

	Maximum Score.	(744) Bumban	(952) Kamabai	(564) Kamba	(779) Makama	(1304) Makeni	(516) Kamaranka	(523) Batkanu	(551) Buya	(595) Makari	(1038) Kamagbo	(1182) Bendembu.	(782) Kalangba	(500) Kamaka	(1482) Binkolo
Administrative Status	2.0	0.5	1.0	0.25	0.5	2.0	1.0	1.0	0.25	0.5	1.0	0.5	1.0	0.25	1.0
Court Class	2.0	0.5	1.5	0.25	0.5	2.0	1.5	1.5	0.25	0.5	1.5	0.5	1.5	0.25	1.5
Religion	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0
Higher Education	2.0	0.0	1.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Primary Education	2.0	1.0	1.0	1.0	1.0	1.5	1.0	1.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0
Health Centres	2.0	0.0	1.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	1.0
Maternity Clinics	1.0	0.0	1.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0	0.0	1.0
Special disease Clinics	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Treated pipe-borne water	1.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	1.0	0.0	0.5	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.5
General Post Office	2.0	0.0	1.0	0.0	0.5	2.0	0.5	1.0	0.0	0.0	1.0	0.5	0.5	0.0	1.0
Telephones	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government Police Station	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chiefdom Police Station	1.0	0.0	1.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	0.0	1.0	0.0	1.0
Agricultural and Veterinary post	2.0	0.0	0.25	0.0	0.0	2.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Banks	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Supermarkets	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Stores	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale Stores	1.0	0.5	0.5	0.5	0.5	1.0	1.0	0.5	0.5	0.5	0.5	1.0	1.0	0.5	1.0
Recreation - Cinemas, clubs.	1.0	0.0	0.5	0.0	0.0	1.0	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5
Total:	28	4.5	13.25	3.0	5.0	26.5	9.5	14.0	3.0	4.5	10.5	8.5	9.5	2.0	13.0

	(508) Kadanda	(655) Kasem-gbe.	(950) Mate-bai	(646) Rogbla	(1122) Kamalo	(3572) Kamakwie	(504) Pimbowya	(450)[1] Babala	(450)[1] [illegible]	(450)[1] Kagbaneh	(450)[1] [illegible]	(450)[1] Kagbamy	(450)[1] [illegible]	(450)[1] Makongolo	(450)[1] Kambia	(450)[1] Loko
Administrative Status	0.25	0.25	0.5	0.25	1.0	1.0	1.0	0.25	0.5	1.0	1.0	1.0	0.5	0.25	0.5	0.25
Court Class	0.25	0.25	0.5	0.25	1.5	1.5	1.0	0.25	0.5	1.5	1.0	1.0	0.25	0.0	0.5	0.25
Religion	1.0	1.0	1.0	2.0	2.0	2.0	1.0	1.0	1.0	2.0	1.0	2.0	1.0	2.0	2.0	2.0
Higher Education	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Primary Education	0.0	0.0	1.0	1.0	1.0	1.25	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Health Centres	0.0	0.0	0.0	0.25	0.0	2.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maternity Clinics	0.0	0.0	0.0	0.5	1.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0
Special disease Clinics	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Treated pipe-borne water	0.0	0.0	1.0	0.25	0.0	1.0	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
General Post Office	0.0	0.0	0.5	0.25	0.5	1.0	0.25	0.25	0.0	0.5	0.25	0.0	0.25	0.0	0.25	0.0
Telephones	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government Police Station	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chiefdom Police Station	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0
Agricultural and Veterinary post	0.0	0.0	0.25	0.0	0.0	1.5	0.0	0.0	0.25	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Banks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Supermarkets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Stores	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale Stores	0.25	0.25	0.5	0.25	1.0	1.0	0.25	0.25	0.25	0.5	0.25	0.25	0.25	0.0	0.25	0.25
Recreation - Cinemas, clubs.	0.0	0.0	0.0	0.0	0.5	0.5	0.25	0.0	0.0	0.5	0.25	0.25	0.0	0.0	0.0	0.0
Total:	1.75	1.75	5.25	5.0	9.5	18.75	6.0	4.5	3.5	9.0	4.75	6.5	3.25	3.25	5.5	3.75

1. estimated population by 1963.

Appendix 5.2 Actual Inter-vertex sums of Distances In Bombali, 1972.

	Samaya	Mabunyele	Fintonya	Kamakwie	Kamalo	Laia	Kamaranka	Gbanti	Rogbin	Kagbaray	Rokulan	Rogbore	Mateboi	Batkamu	Bendembu	Kamabai	Bumban	Kalangba	Kunsho	Masomgbo	Makama	Mapaki	Binkolo	Makeni
Samaya																								
Mabunyele	3																							
Fintonya	26	23																						
Kamakwie	13	10	13																					
Kamalo	21	18	21	8																				
Laia	33	30	33	20	12																			
Kamaranka	30	27	30	17	9	21																		
Gbanti	41	38	41	28	20	32	11																	
Rogbin	38	35	38	25	17	29	10	9																
Kagbaray	44	41	44	31	23	35	14	13	8															
Rokulan	39	36	39	26	18	30	9	8	3	7														
Rogbore	41	38	41	28	20	32	11	10	5	9	2													
Mateboi	57	54	57	44	36	48	27	26	21	25	18	16												
Batkamu	62	59	62	49	41	53	32	31	26	30	23	21	5											
Bendembu	46	43	46	33	25	37	16	15	10	14	7	5	15	20										
Kamabai	86	83	86	73	65	77	56	55	50	54	47	45	55	60	40									
Bumban	85	82	85	72	64	76	55	54	49	53	46	44	54	59	39	7								
Kalangba	53	50	53	40	32	44	23	22	17	21	14	12	22	27	7	33	32							
Kunsho	61	58	61	48	40	52	31	30	25	29	22	20	30	35	15	25	24	8						
Masomgbo	73	70	73	60	52	64	43	42	37	41	34	32	42	47	27	27	26	20	12					
Makama	69	66	69	56	48	60	39	38	33	37	30	28	38	43	23	23	22	16	8	6				
Mapaki	82	79	82	69	61	73	52	51	46	50	43	41	51	56	36	36	35	29	21	19	13			
Binkolo	71	68	71	58	50	62	41	40	35	39	32	30	40	45	25	15	14	18	10	12	8	21		
Makeni	68	65	68	55	47	59	38	37	32	36	29	27	37	42	22	22	21	15	7	5	1	14	7	
TOTAL	1142	1076	1162	876	748	1012	642	692	598	698	562	558	818	928	566	1120	1098	608	672	864	774	1060	812	754

Appendix 5.3 Accessibility of Chiefdom Towns.
Sums of distance x population.

	Fintonya	Kamakwie	Kamalo	Kamaranka	Kagbaray	Rogbore	Batkanu	Kamabai	Kalangba	Masomgbo	Mapaki	Binkolo	Makeni
Fintonya		6552	10584	15120	22176	20664	31248	43344	26712	36792	41328	35784	34272
Kamakwie	46436		28576	60724	110732	110016	175028	260756	142880	214320	246468	207176	207176
Kamalo	23562	8976		10098	25806	22440	46002	72930	35904	58344	68442	56110	52734
Kamaranka	15480	8772	4644		7224	5676	16512	28896	11868	22188	26832	21156	19608
Kagbaray	19800	13950	10350	6300		4050	13500	24300	9450	18450	22500	17550	16200
Rogbore	18450	12600	9000	4950	4050		9450	20250	5400	14400	18450	13500	12150
Batkanu	32426	32426	21443	16736	15690	10983		31380	14121	24581	29288	23535	21966
Kamambai	81872	69496	61880	53312	51408	42840	57120		31416	25704	34272	14280	20944
Kalangba	41446	31280	25024	17986	16422	9384	21114	25806		15640	22678	14076	11730
Masomgbo	75774	62280	53976	44634	42558	33216	48786	28026	20760		19722	12456	5190
Mapaki	36900	31050	27450	23400	22500	18450	25200	16200	13050	8550		9450	1800
Binkolo	105222	85956	74100	60762	57798	44460	66690	22230	26676	17784	31122		10374
Makeni	836672	676720	578288	467552	442944	332208	516768	270688	184560	61520	49216	86128	
TOTAL	1334040	1040058	905315	781574	819308	644378	1027418	844806	522797	518273	610318	5m91	414144

Appendix 5.4. Total Vertex accessibility - Sums of Distances of Population times the Population at all Vertices.

	Samaya	Mabunyele	Fintonya	Kamakwie	Kamalo	Laia	Kamaranka	Gbanti	Rogbin	Kagbaray	Rokulan	Rogbere	Mateboi	Batkanu	Bendembu	Kamabai	Bumban	Kalangba	Kunaba	Masengbo	Makama	Mapaki	Binkolo	Makeni
Samaya		1350	11700	5850	9450	14850	13500	18450	17100	19800	17550	18450	25650	27900	20700	38700	38250	23850	27450	32850	31050	36900	31950	37800
Mabunyele	1350		10350	4500	8100	13500	12150	17100	15750	18450	16200	17100	24300	26550	19350	37350	36900	22500	26100	31500	29700	35550	30600	29250
Fintonya	13104	11592		26552	10584	16632	15120	20664	19152	22176	19656	20664	28728	31248	23184	43344	42840	26712	30744	36792	34776	41328	35784	30600
Kamakwie	46436	35720	46436		28576	71440	60724	100016	89300	110732	92872	100016	157168	175028	117876	260765	257184	142380	171456	214320	200952	246469	207176	196469
Kamalo	23562	20196	23562	8976		13464	10098	22440	19074	25806	20196	22440	40392	46002	28050	72930	71808	35934	44880	58344	53856	68442	56100	52734
Laia	14850	13500	14850	9000	5400		9450	14400	13050	15750	13500	14400	21600	23850	16650	36450	34200	19800	23400	28800	27000	32850	27900	26550
Kamaranka	15480	13922	15480	8772	4644	10836		5676	5160	7224	4644	5676	13932	16512	8256	28896	28380	11868	15996	22188	21672	26832	21156	19608
Gbanti	18450	17100	18450	12600	9000	14400	4950		4050	5850	3600	4500	11700	13950	6750	24750	24300	9900	13500	18900	17100	22950	18900	16650
Rogbin	24548	22610	24548	16150	10982	18734	6460	5814		5168	1938	3230	13566	16796	6460	32300	31654	10982	16150	23902	21318	29716	22610	20672
Kagbaray	19800	18450	19800	13950	10350	15750	6300	5850	3600		3150	4050	11250	13500	6300	24300	23850	9450	13050	18450	16650	22500	17550	16200
Rokulan	17550	16200	17550	11700	8100	13500	3150	3600	1350	3150		900	8100	10350	3150	21150	20700	6300	9900	15300	13500	19350	14400	13050
Rogbere	18450	17100	18450	12600	9000	22500	4950	4500	2250	3150	900		7200	9450	2250	20250	19800	5400	9000	22500	12600	18450	13500	12150
Mateboi	54150	51300	54150	41800	34200	45600	25650	24700	19950	23750	17100	15200		4750	14250	52250	51300	20900	28500	39900	36100	48450	38000	35150
Batkanu	32426	30857	32426	25627	21443	27719	16736	16213	13598	15690	12029	10983	2615		10460	31386	30857	14121	18305	24581	22489	29258	23935	21966
Bendembu	54372	50826	54372	39006	29550	43734	18912	17730	11820	16548	8274	5910	17730	23640		47280	46098	8274	17730	31914	27186	42552	29550	26004
Kamabai	81872	79016	81872	69496	61880	73304	53312	52360	47600	51408	44744	42840	52360	57120	38080		6664	31416	23800	25704	21896	34272	24280	20944
Bumban	63240	61008	63240	53568	47616	56544	40920	40176	36456	39432	34224	32736	40176	43896	29016	5208		23808	17856	19344	16368	26040	20416	15624
Kalangba	41446	39100	41446	31280	25024	34408	17986	17204	13294	16422	10958	9384	17204	21114	5474	25806	25024		6256	15640	12512	22678	14076	11730
Kunaba	27450	26100	27450	21600	18000	23400	13950	13500	11250	13050	9900	9000	13500	15750	6750	11250	10800	3600		5400	3600	9450	4500	3150
Masengbo	75774	72660	75774	62280	53976	66432	44634	43596	38406	42558	35292	33216	43596	48796	28026	28026	26988	20760	12456		6228	19722	12456	9190
Makama	53751	51414	53751	43624	37392	46740	30381	29602	25707	28823	23370	21812	29642	33497	17917	17917	17138	12464	6232	4674		10127	6232	779
Mapaki	36900	35550	36900	31050	27450	32850	23400	22950	20700	22500	19350	18450	22950	25200	16200	16200	15750	13950	9450	8550	5850		9450	6300
Binkolo	105222	100776	105222	85956	74250	92070	60885	59280	51870	57798	47424	44460	59280	66690	37050	22230	20748	26676	14820	17784	11856	31122		10374
Makeni	836672	799760	836672	676720	578288	725936	467552	455248	393728	442944	356816	332208	455248	516768	270688	270688	258384	184560	86128	61520	12304	172256	82128	
Total:	1676855	1586117	1684451	1292657	1123255	1494343	961170	1011069	874215	1008179	813677	787625	1117847	1268347	732887	1167611	1139617	685175	643159	778857	654095	1047293	765349	621735

Appendix 5.5 Total Accesibility of Chiefdom Population from Chiefdom Towns.

	Chiefdom Population	Fintonya.	Kamakwie.	Kamalu.	Kamaranka.	Kagbaray.	Rogbore.	Batkanu.	Kamabai.	Kalangba.	Masomgbo.	Mapaki	Binkolo	Makeni
Fintonya	9,784		127192	205464	293520	430496	401144	606608	841424	518552	714232	802288	694664	665312
Kamakwie	18,763	243919		150104	318971	581653	525364	919387	1369699	750520	1125780	1294647	1088254	1088254
Kamalu	12,528	263088	100224		112792	288144	250560	513648	814320	400896	651456	764208	626400	588816
Kamaranka	13,921	417630	236657	125289		194894	153131	445472	779576	320183	598603	723892	570761	528998
Kagbaray	6,124	269456	189844	140852	85736		55116	183720	330696	128604	251084	306200	238836	220464
Rogbore	12,922	529802	361816	258440	142142	116298		271362	581490	155064	413504	529802	387660	348894
Batkanu	8,384	519808	410816	343744	268288	251520	176064		503040	226368	394048	469504	377280	352128
Kamabai	24,546	2110956	1791858	1595490	1374576	1325484	1104570	1472760		810018	662742	883656	368190	540012
Kalangba	22,141	1173473	88564	708512	509243	464961	265692	597807	730653		442820	642089	398538	332115
Masomgbo	19,696	1437808	1181760	1024192	846928	807536	630272	925712	531792	393920		374224	236352	98480
Mapaki	11,277	924714	778113	687897	586404	563850	462357	631512	405972	327033	214263		236817	45108
Binkolo	16,612	1179452	963496	830600	681092	647868	498360	747540	249180	299016	199344	348852		116284
Makeni	22,078	1501304	1214290	1037666	838964	794808	596106	927276	485716	331170	110390	88312	154546	
	TOTAL	10571410	7444630	7108250	6058616	6467512	5118736	8242804	7623558	4661344	5778266	7227674	5378298	4924865

Appendix 5.6 Squared Differences between Actual and Desire Line distances.

	Samaya	Mabunyele	Fintonya	Kamakwie	Kamalo	Laia	Kamaranka	Ghanti	Rogbin	Kagbaray	Rokulan	Rogbore	Mateboi	Batkanu	Bendembu	Kamabai	Bumban	Kalangba	Kunsho	Masongbo	Makama	Mapaki	Binkolo	Makeni
Samaya																								
Maitunele	1.0																							
Fintonya	110.25	90.25																						
Kamakwie	6.25	4.0	2.25																					
Kamalo	64.0	49.0	9.00	2.25																				
Laia	182.25	182.25	256.00	121.00	12.25																			
Kamaranka	100.00	72.25	16.00	6.25	1.00	81.00																		
Ghanti	400.00	324.00	121.00	100.00	64.00	182.25	20.25																	
Rogbin	169.00	132.25	30.25	25.00	9.00	110.25	12.25	25.00																
Kagbaray	289.00	256.00	169.00	121.00	81.00	420.25	49.00	6.25	1.00															
Rokulan	144.00	121.00	25.00	16.00	4.00	100.00	1.00	4.00	1.00	0.00														
Rogbore	182.25	156.25	42.25	25.00	12.25	132.25	4.00	9.00	6.25	2.25	2.25													
Mateboi	756.25	600.25	256.00	225.00	156.25	324.00	81.00	210.25	72.25	36.00	36.00	20.25												
Batkanu	930.25	756.25	324.00	289.00	225.00	400.00	121.00	289.00	121.00	64.00	64.00	49.00	6.25											
Bendembu	196.00	156.25	42.25	30.25	16.00	156.25	6.25	16.00	9.00	16.00	4.00	0.00	4.00	30.25										
Kamabai	2116.00	2025.00	1980.25	1681.00	1444.00	2756.25	1296.00	992.25	961.00	1681.00	841.00	729.00	729.00	900.00	576.00									
Bumban	1764.00	1722.25	1722.25	1406.25	1156.00	2450.25	992.25	702.25	676.00	1296.00	576.00	484.00	484.00	600.25	361.00	9.00								
Kalangba	225.00	132.25	64.00	49.00	25.00	210.25	16.00	20.25	12.25	49.00	6.25	0.25	36.00	81.00	1.00	324.00	306.25							
Kunsho	289.00	240.25	121.00	81.00	64.00	342.25	42.25	42.25	30.25	110.25	20.25	4.00	64.00	144.00	4.00	121.00	100.00	1.00						
Masongbo	529.00	484.00	272.25	225.00	169.00	552.25	144.00	169.00	144.00	240.25	121.00	81.00	306.25	484.00	81.00	49.00	12.25	64.00	30.25					
Makama	324.00	272.25	132.25	100.00	64.00	361.00	49.00	49.00	49.00	121.00	30.25	16.00	110.25	225.00	16.00	16.00	2.25	9.00	2.25	6.25				
Mapaki	441.00	380.25	1225.00	210.25	156.25	625.00	121.00	100.00	90.25	256.00	72.25	42.25	156.25	256.00	36.00	144.00	132.25	30.25	20.25	25.00	2.25			
Binkolo	529.00	600.25	380.25	306.25	225.00	756.25	182.25	132.25	121.00	324.00	100.00	64.00	121.00	196.00	49.00	20.25	6.25	25.00	4.00	0.25	0.25	49.00		
Makeni	324.00	576.00	144.00	100.00	64.00	400.00	49.00	49.00	49.00	121.00	25.00	16.00	100.00	196.00	16.00	25.00	49.00	9.00	1.00	1.00	0.16	4.00	1.00	
Total.	10071.5	9333.75	7534.75	5132.0	4072.25	11113.75	3463.0	4027.25	2856.25	5709.25	2314.25	2079.75	4890.5	6751.25	1822.5	21416.0	17010.0	1696.0	1878.5	4190.0	1957.41	4565.0	4181.25	2319.16
(The network = 243.73)	419.65	388.91	313.95	213.83	169.68	463.07	144.29	167.8	119.01	237.89	96.43	86.66	203.77	281.3	75.94	892.33	708.75	70.67	78.27	174.58	81.56	190.21	174.22	96.63

Appendix 5.7 Invertex Link Demands in Bombali

Vertex.	Population.	Samaya	Mabunyele	Pintonya	Kamakwie	Kamalo	Laia	Kamaranka	Gbanti	Rogbin	Kagbaray	Rokulan	Rogbere
Samaya	450												
Mabunyele	450	22500.00											
Pintonya	504	335.5	4287.30										
Kamakwie	3572	9511.24	16074.00	10652.59									
Kamalo	1122	1144.91	1158.33	1282.29	62621.63								
Laia	450	185.99	225.00	208.26	4018.90	3506.25							
Kamaranka	516	258.00	318.52	288.96	6377.69	7147.56	526.53						
Gbanti	450	120.46	140.24	134.92	2050.26	1262.25	197.75	1919.60					
Rogbin	646	201.32	237.31	225.47	3692.02	2508.00	345.66	3333.36	3588.89				
Kagbaray	450	104.60	120.46	117.15	1672.60	954.44	165.31	1184.69	1198.22	4542.19			
Rokulan	450	133.14	156.25	149.11	2377.81	1558.33	225.00	2866.67	3164.06	32300.00	4132.65		
Rogbere	450	120.46	140.24	134.92	2050.26	1262.25	197.75	1919.00	2025.00	11628.00	2500.00	5062.5	
Matebei	950	131.58	146.60	147.37	1752.79	822.45	185.55	672.43	632.40	1391.61	684.00	1319.44	1669.92
Batkanu	523	61.23	67.61	68.57	778.07	349.08	83.78	263.54	244.90	499.79	261.50	444.90	533.67
Bendembu	1182	251.37	287.67	281.53	3877.05	2121.93	388.53	2382.47	2364.00	7635.72	2713.78	10855.10	21276.00
Kamabai	952	57.92	62.19	64.87	638.12	252.82	72.26	156.64	141.62	246.00	146.91	193.93	211.56
Bumban	744	46.34	49.79	51.90	512.65	203.80	57.96	126.91	114.81	200.18	119.19	158.22	172.93
Kalangba	782	125.28	140.76	140.31	1745.82	856.84	181.77	762.78	727.07	1748.00	797.96	1795.41	2443.75
Kunsho	450	54.42	60.20	60.95	697.66	315.56	74.89	241.62	225.00	465.12	240.78	418.39	506.25
Masongbo	1030	87.65	95.33	98.17	1029.93	430.71	114.04	289.67	264.80	489.81	277.87	404.07	465.15
Makama	779	73.63	80.48	82.47	887.30	379.36	97.38	264.28	242.76	462.11	256.06	389.50	447.13
Mapaki	450	30.12	32.45	33.73	337.62	135.69	38.00	85.87	77.85	137.38	81.00	109.52	120.46
Binkolo	1482	132.30	144.23	148.17	1573.63	665.12	173.49	454.91	416.81	781.53	438.46	651.27	741.00
Makeni	12304	197.40	1310.49	1341.09	14528.89	6249.47	1590.58	4396.72	4044.41	7762.09	4272.22	6583.59	7595.06
TOTAL LINK DEMANDS:		36,864.81	44,376.88	16,477.03	149,458.13	97,589.06	12,860.19	36,237.82	25,297.48	84,421.46	26,982.04	121,011.38	108,776.76

Vertex.	Population.	Matebei	Batkanu	Bendembu	Kamabai	Bumban	Kalangba	Kunsho	Masongbo	Makama	Mapaki	Binkolo	Makeni
Samaya	450												
Mabunyele	450												
Pintonya	504												
Kamakwie	3572												
Kamalo	1122												
Laia	450												
Kamaranka	516												
Gbanti	450												
Rogbin	646												
Kagbaray	450												
Rokulan	450												
Rogbere	450												
Matebei	950												
Batkanu	523	19874											
Bendembu	1182	4490.67	1545.47										
Kamabai	952	298.98	138.30	703.29									
Bumban	744	242.39	111.78	578.18	14454.86								
Kalangba	782	1534.92	561.02	18863.76	683.62	568.17							
Kunsho	450	475.80	192.12	2364.00	685.44	581.25	5498.44						
Masongbo	1030	559.01	245.76	1683.01	1355.52	1142.41	2029.29	5243.75					
Makama	779	512.50	220.34	1740.60	1401.91	1197.47	2579.60	5477.54	22461.17				
Mapaki	450	164.36	75.05	410.42	330.56	273.31	418.43	459.18	1293.91	2074.26			
Binkolo	1482	879.94	382.76	2802.75	6270.51	5625.55	3576.93	6669.00	10682.75	18038.72	1912.24		
Makeni	12304	8538.20	3647.95	30048.20	24201.26	20757.77	42763.24	112995.92	510862.08	9584816.00	23254.98	372133.22	
TOTAL LINK DEMANDS:		47,626.11	30,651.19	120,165.5	52,769.09	47,347.82	90,343.17	142,008.28	559,596.86	9,643,982.57	36,480.39	438,893.29	10,779,[illegible]

Appendix 6.1 Chiefdom characteristics on 49 variables.

NO.	VARIABLE. / CHIEFDOMS.x'	BIRIWA	SEBORA	GBANTI KAMARANKA	LIBEIS-AYGA-HUN	MAGBAI-MBA.	MAKARI GBANTI	PAKI MASABONG	GOWAHUN	SAFROKO LIMBA	SANDA TENDAREN	SANDA LOKO	SELLA LIMBA	TAMBA-KHA
1	Percentage of dominant tribe	78.4	77.7	88.7	72.5	76.5	76.0	53.8	84.9	97.5	77.9	46.7	81.6	90.7
2	Percentage of chiefdom to crude activity rate.	5.16	3.5	2.1	1.75	1.1	3.28	2.25	3.84	2.9	1.86	2.41	3.82	2.34
3	Crude activity rate for chiefdom	41.78	31.49	30.68	41.57	36.41	33.08	39.82	34.45	34.7	28.6	38.29	40.44	47.38
4	Crude activity rate (males)	21.82	21.29	21.37	23.8	23.5	21.47	21.58	21.81	22.29	18.3	21.7	21.65	23.91
5	Crude activity rate (females)	19.96	10.2	9.3	17.78	12.92	11.61	18.24	12.64	12.41	10.3	16.59	18.79	23.67
6	Seasonal feeder roads	0.0	10.0	2.0	10.0	3.9	8.0	0.0	0.0	6.0	2.0	2.0	13.0	14.2
7	Chiefdom town link demand (all vertices)	0.528	107.999	0.362	0.307	0.27	5.596	0.365	0.903	4.349	1.088	0.976	1.495	0.165
8	Link demand (chiefdom vertices)	0.501	102.219	0.308	0.307	0.27	3.508	0.365	1.053	4.349	0.905	0.552	0.969	0.267
9	Chiefdom town accessibility(d ip,jp)	0.586	1.608	1.04	0.788	0.992	1.284	0.955	1.459	1.342	1.27	0.89	0.774	0.594
10	Population (1963)	245.6	220.78	139.21	83.84	61.24	196.96	112.77	221.41	166.12	129.22	125.28	187.63	97.84
11	Population (Chiefdom town,1963)	9.52	123.04	5.16	5.23	4.50	10.38	4.50	7.82	14.82	4.50	11.22	35.72	5.04
12	% Literacy in English (1963)	1.7	11.2	2.1	1.4	1.5	1.9	1.9	2.1	1.4	3.7	1.3	2.5	0.6
13	No. of Settlements >500 (1963)	2.0	3.0	1.0	1.0	0.0	3.0	0.0	3.0	3.0	2.0	1.0	1.0	1.0
14	Agricultural Population(1963)	89.80	37.65	37.10	31.25	17.94	57.92	41.54	65.36	52.50	31.08	44.35	64.31	43.25
15	Area	2.83	0.97	1.48	1.47	0.98	2.19	0.79	2.85	1.49	1.39	2.28	1.50	8.80
16	Land > 500 ft.high	153.8	0.0	6.54	0.0	32.38	0.62	4.98	14.32	15.57	4.98	36.12	4.98	191.16
17	Land < 200 ft.	33.62	94.65	98.38	171.86	7.47	229.77	6.23	135.12	8. 72	108.35	37.36	63.51	154.42
18	Land 200 - 500 ft.	132.01	40.47	38.61	6.23	96.52	34.25	68.49	78.46	94.02	23.66	136.37	96.52	454.56
19	Motorable roads (miles)	40.2	40.8	26.5	36.9	8.9	45.9	10.3	29.2	14.7	26.5	16.4	41.0	45.0
20	Basic ServiceScores (Chiefdom total)	17.75	34.5	12.75	14.0	6.5	23.5	9.0	20.0	16.5	19.5	13.25	22.0	9.5
21	Basic Service Scores (Chiefdom Town)	13.25	26.5	9.5	14.0	6.5	10.5	9.0	9.5	13.0	4.75	9.5	13.75	6.0
22	Time-space convergence(1900-1925).	211.17	90.85	59.63	90.38	59.57	106.57	90.94	71.4	109.14	59.51	57.56	86.73	59.69
23	Time-space convergence(1925-1955)	2.3	2.42	2.04	1.51	1.86	1.93	1.43	2.48	2.37	2.45	1.64	1.36	1.0
24	Time-space convergence(1900-1955)	1.13	1.72	1.76	1.36	1.64	1.65	1.31	1.99	1.57	2.0	1.65	1.28	1.0
25	Travel Time (1900)	1.13	1.71	1.76	1.26	1.64	1.49	1.21	1.99	1.58	2.03	1.5	1.29	1.0
26	Travel Time (1925)	2.07	2.29	2.0	1.47	1.83	1.85	1.4	2.4	2.25	2.42	1.61	1.35	1.0
27	Travel Time (1955)	1.13	1.71	1.76	1.23	1.64	1.49	1.22	1.99	1.7	2.22	1.5	1.29	1.0
28	Service Score, Education.	3.0	5.5	2.0	2.0	1.0	3.0	1.0	2.0	1.0	3.0	2.0	3.25	2.0
29	Service Score, Medical	2.0	3.0	1.0	2.0	0.0	3.0	1.0	3.0	3.0	1.75	1.0	4.0	0.0
30	Telecommunications and Posts	1.0	3.5	0.75	1.0	0.0	1.25	0.5	1.0	1.0	1.25	0.5	1.0	0.25
31	Commerce & Banks	2.0	5.0	1.25	1.0	0.25	1.5	0.5	2.5	1.5	1.25	1.25	1.0	0.5
32	Administration	4.5	7.5	4.25	3.5	3.0	6.0	3.5	5.0	4.5	5.0	4.0	4.25	4.0
33	Recreation	0.5	1.0	0.5	0.5	0.25	0.5	0.5	1.0	0.5	0.25	0.5	0.5	0.25
34	Special Government & Mission development	0.75	4.0	0.0	2.0	0.0	0.0	0.0	0.5	1.0	2.0	0.0	3.0	0.5
35	Religion	4.0	5.0	3.0	2.0	2.0	8.0	2.0	5.0	4.0	5.0	4.0	4.0	2.0
36	Shape Index $\bar{d}_R/\bar{d}_A$	0.681	0.464	0.723	0.585	0.489	0.776	0.839	0.895	0.667	0.504	0.641	0.765	0.875
37	" " $\bar{d}_A/\bar{d}_P$	1.2	2.3	1.2	1.1	1.1	1.3	1.1	1.2	1.2	1.2	1.5	1.6	1.3
38	" " r_I/r_E	0.312	0.324	0.348	0.28	0.318	0.41	0.35	0.433	0.298	0.384	0.4	0.394	0.395
39	Boundary/Area	0.392	0.578	0.527	0.531	0.653	0.511	0.655	0.358	0.658	0.46	0.382	0.489	0.165
40	Shape Index $\bar{d}/A$	9.303	8.43	6.85	8.43	7.71	7.83	4.34	7.39	7.19	9.0	8.97	5.94	13.056
41	" " $\bar{d}_P$	7.556	3.7	5.869	7.735	6.817	6.036	4.2	6.1	6.047	7.394	6.012	3.763	10.04
42	Population density at 1 mile radius of Chiefdom Town	42.966	325.0	27.053	32.338	26.0	49.332	22.279	50.923	63.654	28.419	47.74	130.49	3.819
43	Population density at 2 mile radius of Chiefdom town	11.794	47.581	12.731	10.638	9.749	15.922	13.333	13.261	15.495	20.0	14.835	22.809	2.652
44	Circuity of chiefdom towns (all vertices)	1.12	10.35	6.93	3.55	4.2	5.73	5.26	14.15	5.75	11.54	5.89	4.68	3.19
45	Circuity of chiefdom vertices	1.25	11.22	6.41	3.55	4.33	7.91	5.26	13.64	5.74	5.93	3.16	3.32	2.75
46	Accessibility - d(ip,jp) Chiefdom Town vertices	1.18	2.41	1.28	0.97	1.22	1.93	1.64	1.99	1.96	1.55	1.1	0.96	0.75
47	Accesibility - d(ip,jp) Population of Chiefdom	1.312	2.031	1.651	1.213	1.346	1.731	1.384	2.145	1.859	1.954	1.407	1.343	0.946
48	Accesibility - d(i,j) Chiefdom town Vertices	1.748	3.04	2.732	1.953	2.551	2.32	1.852	3.096	2.457	3.155	2.331	1.996	1.55
49	Link demand - Chiefdom town	3.427	100.717	2.333	2.551	1.27	52.91	3.267	4.371	39.854	1.997	8.221	10.383	1.43

x' Most values were converted weightings to fit computer format.

Appendix 6.2

SPEARMAN CORRELATION MATRIX

	VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12
1	TRIBE	1.0000	0.2802	-0.0549	0.1703	-0.0604	0.1354	-0.0229	0.0369	0.0989	0.3132	0.1209	0.0673
2	DISTCAR	0.2802	1.0000	0.1209	-0.1049	0.1646	-0.0920	0.5446	0.6209	0.1758	0.4955	0.6974	0.2514
3	DCACAR	-0.0549	0.1203	1.0000	0.7637	0.5615	0.2261	-0.5500	-0.5110	-0.8242	-0.2527	-0.0110	-0.6360
4	MALECAR	0.1704	-0.1049	0.7637	1.0000	0.6445	0.2445	-0.6044	-0.5165	-0.5110	-0.2956	-0.1154	-0.3091
5	FEMCAR	-0.0604	0.1643	0.5615	0.6445	1.0000	0.1250	-0.4470	-0.4835	-0.8242	-0.2143	-0.2469	-0.5316
6	FEEDERS	0.1554	-0.0920	0.2256	0.2445	0.1250	1.0000	0.0948	0.0014	-0.2674	-0.2522	0.3503	-0.1195
7	LINKVERTS	-0.0228	0.5449	-0.5500	-0.6044	-0.4470	0.0948	1.0000	0.8615	0.5454	0.6533	0.7308	0.5206
8	LINKMEAN	0.0369	0.6209	-0.5110	-0.5165	-0.4835	0.0014	0.8615	1.0000	0.7088	0.7203	0.7153	0.5179
9	TCNACCESS	0.0989	0.1758	-0.8242	-0.5110	-0.8242	-0.2679	0.3614	0.7088	1.0000	0.4550	0.2196	0.5041
10	DOMPOP	0.3132	0.4955	-0.2527	-0.2956	-0.2143	-0.2321	0.6533	0.7203	0.4550	1.0000	0.6154	0.5179
11	TCNPOP	0.1209	0.6978	-0.0110	-0.1154	-0.2469	0.3503	0.7308	0.7253	0.2196	0.6154	1.0000	0.1525
12	LITERACY	0.0673	0.2514	-0.6360	-0.3091	-0.5316	-0.1195	0.5206	0.5179	0.5041	0.5179	0.1525	1.0000
13	TOWNS	0.3764	0.6291	-0.3709	-0.2143	-0.3374	0.0714	0.7735	0.4234	0.6068	0.7775	0.5934	0.3503
14	AGPOP	0.2691	0.5121	0.3132	[illegible]	0.3626	-0.1470	0.4571	0.4341	-0.0739	0.7363	0.5604	-0.0349
15	AREA	0.4266	0.5165	0.3571	0.4341	0.3791	0.0310	-0.0879	-0.0110	-0.2308	0.3352	0.3363	-0.4382
16	UPLAND	0.3665	0.2758	0.4390	0.5714	0.4650	-0.2143	-0.4396	-0.5297	-0.3483	-0.0733	-0.1717	-0.5726
17	SWAMP	0.0334	0.0165	-0.1374	-0.1055	-0.1758	0.4107	0.0220	0.0330	0.0110	0.0659	0.0495	0.0673
18	FARM	0.2242	0.0305	0.5965	0.4966	0.2077	0.0305	-0.2240	-0.1662	-0.4299	-0.0041	0.1552	-0.4565
19	ROADS	0.1511	0.6429	0.1736	-0.1769	0.1703	0.2060	0.2143	0.2115	-0.0659	0.6264	0.3344	0.4268
20	DOMSERVE	0.0981	0.6648	-0.1571	-0.4780	-0.1747	0.2017	0.6297	0.8297	0.4451	0.7302	0.6923	0.6113
21	TONSERVE	-0.0117	0.5648	[illegible]	-0.0330	[illegible]	[illegible]	0.5055	0.5069	0.3874	0.5165	0.6077	0.2139
22	TIMEX	0.1209	0.6165	0.2418	0.0934	0.1044	0.1005	0.3352	0.3846	0.1374	0.5000	0.5846	0.0234
23	TIMET	0.2418	0.3632	-0.7053	-0.4231	-0.4413	-0.0405	0.4479	0.5934	0.4357	0.3879	0.1484	0.5314
24	TIMED	-0.0612	-0.1305	-0.9162	-0.5702	-0.8715	-0.3077	0.3140	0.4165	0.7074	0.2019	-0.1289	0.5416
25	TRAVEX	0.1424	-0.1319	-0.8456	-0.5440	-0.8462	-0.2459	0.3407	0.4721	0.7527	0.1508	-0.0055	0.5755
26	TRAVET	0.2253	0.2194	-0.7308	-0.4615	-0.6978	-0.4144	0.4780	0.5324	0.8187	0.5549	0.1209	0.5451
27	TRAVED	0.1456	-0.0934	-0.9011	-0.3434	-0.6571	-0.1454	0.3901	0.4676	0.7747	0.2253	0.0440	0.5573
28	SCHOOLS	0.0440	0.5275	-0.3264	-0.4505	-0.0879	[illegible]	0.5659	0.4670	0.0824	0.6099	0.5275	0.6140
29	MEDICAL	0.2308	0.6841	-0.1531	-0.2850	-0.1659	0.2019	0.7527	0.5297	0.3974	0.7505	0.7582	0.4986
30	POSTS	0.0631	0.4363	-0.4423	-0.5165	-0.4396	0.1470	0.7940	0.7302	0.5467	0.6648	0.5165	0.6457
31	BANKS	0.2857	0.8489	-0.2720	-0.3764	-0.2410	0.1714	0.7582	0.3297	0.4753	0.4231	0.7835	0.5714
32	ADMIN	0.2926	0.6195	-0.5573	-0.5701	-0.5261	0.0041	0.7471	0.5208	0.6745	0.6263	0.6151	0.6030
33	RECREATION	0.0865	0.6745	-0.0426	-0.1055	-0.1030	-0.0275	0.6550	0.6717	0.5473	0.7019	0.6854	0.4505
34	DEVELOP	0.2885	0.2967	0.0577	-0.0467	0.0335	0.4568	0.4149	0.4144	0.2604	0.3187	0.4470	0.4135
35	RELIGION	0.0907	0.5962	-0.3494	-0.5522	-0.4598	-0.0577	0.6442	0.8344	0.6621	0.7720	0.5402	0.5797
36	DRAD	0.3077	0.3846	0.2912	0.1593	0.2721	-0.1352	-0.2473	-0.0424	-0.1978	0.2143	-0.0989	-0.1225
37	DISTAP	0.1541	0.5632	-0.0714	-0.2555	-0.0439	0.5120	0.5962	0.5165	0.0879	0.4598	0.7473	0.2459
38	RIKET	-0.0440	0.3132	-0.1703	-0.2747	-0.0055	-0.1591	0.1473	0.1946	0.0769	0.2143	0.0330	0.1497
39	RA	-0.2253	-0.3736	[illegible]	-0.1319	-0.3022	0.0206	0.1264	0.1099	0.2967	-0.2527	-0.0385	0.1332
40	DA	-0.0385	0.0330	0.1978	0.1323	0.1868	0.1615	-0.1099	-0.1703	-0.1978	0.0000	-0.0330	-0.2871
41	DIPOP	0.1756	-0.2692	0.4011	0.6464	0.3846	0.0371	-0.5769	-0.5330	-0.3626	-0.3077	-0.4725	-0.5453
42	DENPAD	0.1093	0.6758	-0.2582	-0.2692	-0.0912	0.0709	0.8407	0.8791	0.4615	0.6478	0.9066	0.4052
43	DENRADA	-0.0934	0.4791	-0.5385	-0.7527	-0.4615	0.1113	0.9286	0.3516	0.4835	0.4945	0.5879	0.0690
44	CIRTON	0.1923	-0.0110	-0.8571	-0.5659	-0.8462	-0.1882	0.4011	0.5275	0.8791	0.2967	0.0385	0.6442
45	CIRDOM	0.0879	0.0549	-0.8407	-0.5769	-0.8297	-0.1367	0.4670	0.5769	0.8901	0.3407	0.0879	0.6305
46	TONSIL	0.0440	0.2473	-0.7098	-0.5000	-0.6978	-0.2549	0.5824	0.7088	0.9615	0.4890	0.1923	0.5041
47	TONDOM	0.1374	0.1758	-0.8791	-0.5824	-0.8242	-0.2734	0.6099	0.7143	0.9560	0.4505	0.1978	0.5948
48	DIJ	0.1154	-0.0989	-0.8901	-0.5494	-0.8407	-0.2157	0.5901	0.4615	0.7802	0.2088	0.0385	0.5948
49	DEMAND	-0.0659	0.6978	-0.1923	-0.3352	-0.2363	0.1267	0.5736	0.8791	0.4451	0.6758	0.5901	0.2788

SPEARMAN CORRELATION MATRIX

VARIABLE	13	14	15	16	17	18	19	20	21	22	23	24
1 TRIBE	0.3764	0.2692	0.4286	0.3468	0.0989	0.2246	0.1511	0.0989	-0.0110	0.1209	0.2418	-0.0618
2 DISTCAR	0.6791	0.9121	0.5165	0.1163	0.0165	0.3365	0.5429	0.6648	0.5385	0.5166	0.2692	-0.1305
3 DOMCAR	-0.3764	0.3132	0.3571	0.4190	-0.1374	0.3275	0.1758	-0.3571	0.1319	0.2418	-0.7028	-0.9162
4 MALECAR	-0.2143	0.1099	0.4341	0.5218	-0.2335	0.4956	-0.0769	-0.4780	-0.0330	0.0934	-0.4231	-0.6352
5 FEMCAR	-0.3874	0.2625	0.3681	0.4102	-0.1758	0.5277	0.1703	-0.3297	-0.0110	0.1648	-0.5813	-0.8723
6 FEEDERS	0.0714	-0.1470	0.0316	-0.2143	0.4107	0.0385	0.2088	0.2319	0.3201	0.0096	-0.4409	-0.3077
7 LINKVERTS	0.7335	0.3571	-0.0879	-0.4462	[illegible]	-0.2749	0.2143	0.6197	0.5055	0.3352	0.4470	0.3640
8 LINKMEAN	0.8214	0.4341	-0.0110	-0.1687	0.0330	-0.2212	0.2115	0.6277	0.5055	0.3846	0.5934	0.4135
9 TONACCESS	[illegible]	-0.0330	-0.2308	-0.2283	0.0110	-0.4291	-0.0589	0.4451	0.0824	0.1374	0.6352	0.7624
10 DCMPOP	0.7771	0.7363	0.3752	-0.0783	0.0989	-0.1041	0.6244	0.7802	0.5165	0.5000	0.5479	0.2019
11 TONPOP	0.5934	0.5604	0.2153	-0.1737	0.0495	0.1552	0.3544	0.6921	0.4297	0.3846	0.1464	-0.0288
12 LITERACY	0.3502	0.0343	-0.4082	-0.2724	[illegible]	[illegible]	0.2048	[illegible]	0.2739	0.0234	0.5014	0.5426
13 TOWNS	1.0000	0.4835	0.5626	-0.1429	0.4148	[illegible]	0.5720	0.8132	0.4121	0.4396	0.7360	0.4258
14 AGPOP	0.4330	1.0000	0.6923	0.2216	0.0110	0.4245	0.5297	0.4575	0.3956	0.5165	0.0659	-0.2453
15 AREA	0.3626	0.6923	1.0000	0.2192	0.3726	0.5788	0.4625	0.1209	-0.0330	0.1330	-0.0165	-0.2157
16 UPLAND	-0.1424	0.2815	0.2195	1.0000	[illegible]	0.2462	-0.0657	-0.4356	-0.4227	-0.1592	-0.1168	-0.3297
17 SWAMP	0.4147	0.0220	0.3736	-0.3755	1.0000	-0.4272	0.5379	0.4176	0.0495	-0.1044	0.0549	0.2451
18 FARM	-0.1381	0.4245	0.5298	0.4467	-0.4272	1.0000	0.0124	-0.3176	-0.1148	-0.0975	-0.3503	-0.5385
19 ROADS	0.5132	0.5357	0.4835	-0.0952	0.5879	0.0124	1.0000	0.6154	0.3074	0.5919	0.0907	-0.1500
20 DCMSERVE	0.8137	0.4505	0.1209	-0.4459	0.4176	-0.3118	0.6154	1.0000	0.6044	0.3407	0.4835	0.3173
21 TCNSERVE	0.4122	0.3956	-0.0330	-0.4227	0.0495	-0.1148	0.3074	0.6044	1.0000	0.5824	0.0604	-0.1744
22 TIMEX	0.4396	0.5165	0.0330	-0.1592	-0.1044	-0.0975	[illegible]	0.3407	0.5824	1.0000	0.0769	-0.4272
23 TIMET	0.7359	0.0659	-0.0165	-0.1168	0.0549	-0.3503	0.0507	0.4135	0.0604	0.0769	1.0000	0.7376
24 TIMED	0.4255	-0.2353	-0.2157	-0.3297	0.2451	-0.5385	-0.1500	0.3173	-0.1744	-0.4272	0.7376	1.0000
25 TRAVEX	0.3874	0.3187	-0.1382	-0.2149	0.2714	-0.4227	-0.3012	0.2747	-0.1534	-0.4451	0.7582	0.9582
26 TRAVET	0.7220	0.0110	-0.0594	-0.1332	0.0495	-0.3777	0.0714	0.4780	0.0330	0.0549	0.3946	0.7431
27 TRAVED	0.4470	0.2747	-0.2308	-0.2404	0.2759	-0.4259	-0.2857	0.3777	-0.1209	-0.3456	0.7802	0.9527
28 SCHOOLS	0.4973	0.2912	0.1099	-0.3201	0.4451	-0.1945	0.7473	0.3137	0.5055	0.1374	0.2253	0.1602
29 MEDICAL	0.7194	0.5714	0.1071	-0.4574	0.2253	-0.2415	0.4066	0.8791	0.7527	0.5412	0.3709	0.1429
30 POSTS	0.8095	0.2170	-0.0797	-0.5920	0.4258	-0.5309	0.5099	0.6148	0.5385	0.4093	0.5044	0.4272
31 BANKS	0.7394	0.6340	0.2418	-0.2549	0.1621	-0.0507	0.5457	0.8474	0.5758	0.3074	0.5604	0.2720
32 ADMIN	0.9201	0.3442	0.1854	-0.2843	0.3723	-0.2826	0.5714	0.4723	0.3228	0.3091	0.7164	0.4959
33 RECREATION	0.5944	0.5371	0.1525	-0.2040	0.1745	-0.2571	0.5470	0.4123	0.7184	0.4901	0.4574	0.5434
34 DEVELOP	0.4396	0.0742	-0.0962	-0.3352	0.1896	-0.1497	0.3187	0.6071	0.5632	0.2477	0.2390	-0.0261
35 RELIGION	0.8544	0.4286	0.2143	-0.2473	0.3516	-0.1142	0.4623	0.6764	0.2830	0.1751	0.6423	0.5962
36 DRAC	0.0577	0.6044	0.5604	0.2514	0.1153	0.2540	0.2240	-0.1494	-0.1864	0.1033	-0.2537	-0.2706
37 DISTAP	0.4594	0.3901	0.3544	0.0110	0.2995	0.3077	0.5064	0.4091	0.4093	-0.0440	0.0357	0.0907
38 RIKET	0.1868	0.3681	0.4451	0.1113	0.1736	0.1799	0.2747	0.2418	-0.3297	-0.3571	-0.0330	0.2788
39 BA	-0.1374	-0.4286	-0.8022	-0.4519	-0.4945	-0.3970	-0.5412	-0.1725	0.2143	0.3571	-0.0165	-0.0096
40 DA	0.2443	-0.0348	0.3956	0.3328	0.3516	0.2250	0.4297	0.0879	-0.1538	-0.1648	0.0989	-0.0728
41 DIPOP	0.0027	-0.0989	0.4341	0.4272	0.3297	0.1010	0.1456	-0.3077	-0.3791	-0.0769	-0.0330	-0.2486
42 DENRAD	0.7143	0.4945	0.0934	-0.3475	0.0659	-0.0783	0.2747	0.8352	0.7692	0.3407	0.4231	0.2549
43 DENRADA	0.5165	0.1703	-0.2967	-0.5426	-0.0220	-0.3908	0.0707	0.7418	0.3956	0.1374	0.3407	0.3570
44 CIRTON	0.5055	-0.2088	-0.3407	-0.4849	0.1649	-0.6085	-0.1319	0.3571	0.0000	-0.0494	0.7088	0.8173
45 CIRDOM	0.5577	-0.1264	-0.2912	-0.5508	0.2692	-0.6360	-0.0055	0.4451	0.0440	0.0330	0.6593	0.7926
46 TONSIL	0.6484	0.0549	-0.2902	-0.3613	-0.0824	-0.4217	-0.0330	0.4176	0.1154	0.3187	0.7637	0.6223
47 TONDOM	0.6536	-0.0330	-0.1868	-0.2898	0.0385	-0.3860	-0.1071	0.4835	-0.0110	-0.0714	0.8462	0.8555
48 DIJ	0.4231	-0.3132	-0.2802	-0.2651	0.0659	-0.4160	-0.2637	0.3242	-0.1154	-0.4176	0.7747	0.9327
49 DEMAND	0.6731	0.5714	0.0769	-0.3723	0.0275	-0.0728	0.2214	0.7473	0.7308	0.5330	0.2527	0.1030

SPEARMAN CORRELATION MATRIX

	VARIABLE	25	26	27	28	29	30	31	32	33	34	35	36
1	TRIBE	0.1429	0.2253	0.1968	0.0440	0.2005	0.0632	0.2857	0.2926	0.0865	0.2885	0.0907	0.3077
2	DISTCAR	-0.1319	0.2198	-0.0934	0.5275	0.6841	0.4368	0.6484	0.6195	0.6745	0.2967	0.5962	0.3846
3	DOMCAR	-0.8956	-0.7308	-0.9011	-0.1264	-0.1621	-0.4413	-0.2720	-0.3573	-0.0426	0.0577	-0.5494	0.2912
4	MALECAR	-0.5440	-0.4615	-0.5494	-0.4505	-0.2390	-0.3165	-0.3764	-0.5701	-0.1095	-0.0467	-0.5522	0.1593
5	FEMCAR	-0.8462	-0.6973	-0.8571	-0.0879	-0.1648	-0.4396	-0.2610	-0.5261	-0.1035	0.0385	-0.4698	0.3791
6	FEEDERS	-0.2459	-0.4244	-0.2404	0.2283	0.2019	0.1470	0.0014	-0.0041	-0.0275	0.4588	-0.0577	-0.1332
7	LINKVERTS	0.3407	0.4780	0.3901	0.5659	0.7830	0.7940	0.7582	0.7871	0.5591	0.4149	0.8462	-0.1613
8	LINKMEAN	0.4121	0.5824	0.4670	0.4670	0.8297	0.7802	0.8297	0.8026	0.6717	0.4148	0.8544	-0.0824
9	TUNACCESS	0.7527	0.8187	0.7747	0.0824	0.3874	0.5407	0.4753	0.4745	0.5453	0.0604	0.5521	-0.1976
10	DOMPOP	0.1653	0.5549	0.7253	0.6099	0.7308	0.4605	0.7231	0.8283	0.7019	0.3187	0.7720	0.2143
11	TONPOP	-0.0055	0.1209	0.0440	0.5275	0.7582	0.5165	0.7585	0.5151	0.6854	0.4670	0.5302	-0.0769
12	LITERACY	0.5755	0.5151	0.5573	0.6140	0.4505	0.6497	0.5714	0.6030	0.4505	0.4135	0.5797	-0.1243
13	TOWNS	0.3874	0.7225	0.4423	0.4973	0.7198	0.6091	0.7426	0.4273	0.5948	0.4396	0.8544	0.0577
14	AGPOP	-0.3187	0.0110	-0.2747	0.2912	0.5714	0.3173	0.6346	0.3942	0.5371	0.0742	0.4286	0.6044
15	AREA	-0.3562	-0.0604	-0.2308	0.1099	0.4071	-0.0797	0.2418	0.1854	0.1525	-0.0962	0.2143	0.5604
16	UPLAND	-0.0549	-0.1332	-0.3404	-0.3201	-0.4574	-0.5920	-0.2149	-0.2843	-0.2060	-0.3352	-0.2473	0.2514
17	SWAMP	0.0714	0.0495	0.0769	0.4451	0.2253	0.4258	0.1621	0.3721	0.1745	0.1896	0.3516	0.2253
18	FARM	-0.4217	-0.3777	-0.4299	-0.2195	-0.2418	-0.5319	-0.0509	-0.2815	-0.0371	-0.1497	-0.2412	0.2349
19	ROADS	-0.2912	0.0714	-0.2857	0.7473	0.4038	0.5006	0.5453	0.5714	0.3970	0.3167	0.4629	0.3049
20	DOMSERVE	0.2747	0.4733	0.3077	0.5187	0.6791	0.8148	0.8874	0.6723	0.6113	0.5071	0.8764	-0.0494
21	TONSERVE	-0.1523	0.0330	-0.2209	0.5055	0.7527	0.5385	0.6758	0.3026	0.7124	0.5632	0.2830	-0.1658
22	TIMEX	-0.4451	0.0549	-0.3956	0.1374	0.5412	0.4093	0.3474	0.3041	0.4621	0.2473	0.1731	0.2033
23	TIMET	0.7582	0.9945	0.7802	0.2253	0.3709	0.6044	0.5604	0.7184	0.4574	0.2390	0.6923	-0.2637
24	TIMED	0.9382	0.7431	0.9327	0.1662	0.1429	0.4272	0.2720	0.4259	0.3434	-0.0261	0.5962	-0.2706
25	TRAVEX	1.0000	0.7637	0.9945	0.1099	0.1758	0.3626	0.2940	0.4409	0.2816	0.0962	0.5192	-0.3462
26	TRAVET	0.7637	1.0000	0.7857	0.2473	0.3462	0.5236	0.5275	0.7184	0.3997	0.2610	0.6923	-0.3187
27	TRAVED	0.9945	0.7857	1.0000	0.1099	0.2253	0.4011	0.3352	0.4821	0.3118	0.1291	0.5467	-0.3242
28	SCHOOLS	0.1099	0.2473	0.1099	1.0000	0.5687	0.7390	0.6841	0.6772	0.3887	0.6071	0.6593	-0.1044
29	MEDICAL	0.1758	0.3462	0.2253	0.5687	1.0000	0.7871	0.8613	0.6731	0.6992	0.6113	0.6882	0.0907
30	POSTS	0.3626	0.5236	0.4011	0.7390	0.7871	1.0000	0.7445	0.8599	0.5412	0.6497	0.8187	-0.1923
31	BANKS	0.2940	0.5275	0.3352	0.6841	0.8613	0.7445	1.0000	0.8187	0.7802	0.5426	0.7871	0.0549
32	ADMIN	0.4409	0.7184	0.4821	0.6772	0.6731	0.8599	0.8187	1.0000	0.5412	0.4107	0.9286	0.0124
33	RECREATION	0.2816	0.3997	0.3118	0.3887	0.6992	0.5412	0.7802	0.5412	1.0000	0.3338	0.5261	0.2431
34	DEVELOP	0.0962	0.2610	0.1291	0.6071	0.6113	0.6497	0.5426	0.4107	0.3338	1.0000	0.3077	-0.2104
35	RELIGION	0.5192	0.6923	0.5467	0.6593	0.6882	0.8187	0.7871	0.9286	0.5261	0.3077	1.0000	0.0055
36	URAD	-0.3462	-0.3187	-0.3242	-0.1044	0.0907	-0.1923	0.0549	0.0124	0.2431	-0.2104	0.0055	1.0000
37	DISTAP	0.0742	0.0357	0.0934	0.7280	0.44[illegible]	0.4137	0.6126	0.5563	0.3605	0.3791	0.5728	0.0082
38	RIKET	0.[illegible]429	-0.0604	0.1319	0.2473	0.0824	0.0247	0.1868	0.2871	0.2019	-0.2485	0.4588	0.5879
39	BA	0.0659	0.0000	0.0714	-0.3187	0.0659	0.0522	-0.1978	-0.2047	0.1862	0.0165	-0.2225	-0.3846
40	DA	-0.1703	0.1319	-0.1813	0.3681	-0.2418	0.1429	-0.0330	0.1854	-0.1497	0.2143	0.1648	-0.2692
41	DIPOP	-0.2582	-0.0220	-0.2692	-0.1813	-0.3434	-0.1731	-0.4011	-0.2321	-0.3475	0.0275	-0.2418	0.0385
42	DENRAD	0.2857	0.3956	0.3297	0.5440	0.9011	0.6951	0.8901	0.6552	0.7321	0.5577	0.7088	-0.1648
43	DENRADA	0.3901	0.3681	0.4286	0.5879	0.6868	0.7220	0.6429	0.5607	0.4712	0.4560	0.7363	-0.2088
44	CIRTON	0.8242	0.6923	0.8407	0.0659	0.3352	0.4808	0.3709	0.5426	0.5151	0.1181	0.4973	-0.0714
45	CIRDOM	0.7473	0.6374	0.7582	0.1319	0.3956	0.5357	0.3984	0.6003	0.5453	0.0440	0.5824	0.0000
46	TONSIL	0.5934	0.7418	0.6209	0.0385	0.4093	0.5330	0.4670	0.6387	0.6056	0.0467	0.6016	-0.0769
47	TONDOM	0.8736	0.8352	0.8901	0.1538	0.3984	0.5385	0.5055	0.6854	0.4849	0.1044	0.7253	-0.1813
48	DIJ	0.9945	0.7502	0.9890	0.1484	0.2115	0.4065	0.3524	0.4766	0.3091	0.1511	0.5522	-0.3846
49	DEMAND	0.0440	0.2253	0.0989	0.4560	0.8104	0.6346	0.7802	0.6305	0.7079	0.3159	0.6676	0.0165

SPEARMAN CORRELATION MATRIX

VARIABLE	37	38	39	40	41	42	43	44	45	46	47	48
1 TRIBE	0.1841	-0.0440	-0.2753	-0.0365	0.1763	0.1069	-0.0474	0.1023	0.0879	0.0440	0.1374	0.1154
2 DISTCAR	0.5632	0.3132	-0.3736	0.0330	-0.1632	0.1758	0.3791	-0.0110	0.0549	0.2473	0.1758	-0.0989
3 DOMCAR	-0.0714	0.1703	-0.3069	0.1976	0.4011	-0.2582	-0.1347	-0.3571	-0.7407	-0.7088	-0.8791	-0.3901
4 MALECAR	-0.2555	-0.2747	-0.1319	0.1923	0.6484	-0.2692	-0.7527	-0.6159	-0.5769	-0.5000	-0.5824	-0.5434
5 FEMCAR	-0.0659	-0.0055	-0.3022	0.1868	0.3846	-0.2912	-0.4615	-0.4462	-0.8297	-0.5378	-0.8242	-0.8407
6 FEEDERS	0.5110	-0.0391	0.0206	0.1635	0.0371	0.1907	0.1117	-0.1882	-0.1387	-0.3448	-0.2734	-0.2157
7 LINKVERTS	0.5362	0.1813	0.1264	-0.1099	-0.5769	0.4407	0.5984	0.4011	0.4670	0.5604	0.6099	0.3901
8 LINKMEAN	0.5165	0.1868	0.1099	-0.1703	-0.5330	0.5791	0.6511	0.6275	0.5769	0.7088	0.7143	0.4615
9 TONACCESS	0.0879	0.0769	0.2967	-0.1374	-0.3626	0.4616	0.4835	0.4791	0.6901	0.6615	0.9560	0.7501
10 DOMPOP	0.4695	0.0143	-0.2577	0.0100	-0.1077	0.5978	0.4945	0.1067	0.3462	0.4890	0.4505	0.2065
11 TONPOP	0.7474	0.0330	-0.0385	-0.0330	-0.4775	0.5064	0.5879	0.0385	0.0470	0.1923	0.1978	0.0305
12 LITERACY	0.2483	0.1447	0.1332	-0.2471	-0.5473	0.4002	0.6659	0.6442	0.6305	0.5941	0.5948	0.5946
13 TOWNS	0.4694	0.1868	-0.1374	0.2445	0.0147	0.7143	0.5144	0.5055	0.5377	0.5404	0.5538	0.4211
14 AGPOP	0.3901	0.3681	-0.4205	-0.0365	-0.0335	0.4945	0.1757	-0.2088	-0.1144	0.0549	-0.0130	-0.0132
15 AREA	0.3044	0.4451	-0.5022	0.2956	0.4341	0.0934	-0.1357	-0.3407	-0.2912	-0.2601	-0.2484	-0.2802
16 UPLAND	0.0121	0.1113	-0.4519	0.3334	0.4278	-0.2479	-0.5424	-0.4843	-0.5508	-0.5513	-0.5494	-0.2651
17 SWAMP	0.2944	0.3736	-0.4945	0.3445	0.2247	0.3684	-0.0010	0.1044	0.0692	-0.1824	0.0385	0.0659
18 FARM	0.3077	0.1749	-0.3370	0.2266	0.1036	-0.0743	-0.3564	-0.4685	-0.5360	-0.4617	-0.3346	-0.4462
19 ROADS	0.5065	0.2747	-0.5412	0.4698	0.1456	0.2747	0.0747	-0.1319	-0.0988	-0.0330	-0.1071	-0.2637
20 COMSERVE	0.6191	0.1418	-0.2124	0.0973	-0.3077	0.5582	0.7414	0.5571	0.4451	0.4176	0.4335	0.3242
21 TONSERVE	0.4015	-0.2297	0.2143	-0.1684	-0.2741	0.7692	0.4474	0.0000	0.0441	0.1154	-0.0110	-0.1154
22 TIMEX	-0.0442	-0.3571	0.3571	-0.1648	-0.0719	0.0497	0.0174	-0.0494	0.0241	0.3187	-0.0714	-0.4176
23 TIMET	0.0357	0.0330	-0.0165	0.0989	-0.0300	0.4251	0.3407	0.7048	0.6593	0.7637	0.8462	0.7747
24 TIMED	0.0907	0.2788	-0.7044	-0.0734	-0.2466	0.2349	0.3470	0.8173	0.7676	0.6221	0.8568	0.9327
25 TRAVEX	0.0741	0.1429	0.0659	-0.1703	-0.0681	0.2857	0.3301	0.6241	0.7473	0.6934	0.8736	0.9945
26 TRAVET	0.0357	0.0604	0.0000	0.1319	-0.0220	0.0556	0.3471	0.6921	0.6774	0.7418	0.8352	0.7802
27 TRAVED	0.0934	0.1319	0.0714	-0.1913	-0.1136	0.5037	0.4044	0.8407	0.7581	0.6209	0.8901	0.9890
28 SCHOOLS	0.7280	0.1473	-0.0187	0.3681	-0.0137	0.5440	0.5475	0.3659	0.1313	0.1385	0.1596	0.1484
29 MEDICAL	0.4423	0.0624	0.0659	-0.3418	-0.3414	0.4011	0.6468	0.3351	0.3451	0.4093	0.3984	0.2115
30 POSTS	0.4107	0.6247	0.0522	0.1429	-0.1731	0.4551	0.7245	0.4808	0.5357	0.5330	0.5385	0.4066
31 BANKS	0.6176	0.1608	-0.1378	-0.0330	-0.40[illegible]	0.4991	0.6429	0.3704	0.3941	0.4670	0.6355	0.3524
32 ADMIN	0.5557	0.2471	-0.2047	0.1654	-0.2003	0.6552	0.6507	0.5424	0.6000	0.6387	0.5654	0.4766
33 RECREATION	0.3801	0.2019	0.1882	-0.1497	-0.2475	0.7321	0.4712	0.6152	0.5495	0.6058	0.4449	0.5091
34 DEVELOP	0.0791	-0.2385	0.0165	0.2143	0.0073	0.5577	0.4560	0.3181	0.0440	0.0467	0.1044	0.1511
35 RELIGION	0.5728	0.4583	-0.2225	0.1646	-0.2418	0.7012	0.7360	0.4973	0.5824	0.6016	0.7253	0.5521
36 DRAD	0.0082	0.5879	-0.3846	-0.2492	0.0385	-0.1648	-0.2083	-0.0734	0.0000	-0.0769	-0.1913	-0.3046
37 DISTAP	1.0000	0.4560	-0.3929	0.3049	-0.3491	0.6099	0.5667	-0.0055	0.0522	-0.0027	0.1703	0.1126
38 RIKET	0.4560	1.0000	-0.6154	0.0220	-0.1813	0.0604	0.2198	0.1209	0.2308	0.0495	0.2308	0.1374
39 BA	-0.3929	-0.6154	1.0000	-0.5879	-0.4011	0.0165	0.1703	0.2857	0.2637	0.3846	0.1429	0.0769
40 DA	0.3049	0.0220	-0.5879	1.0000	0.6154	-0.1484	-0.2198	-0.3846	-0.3681	-0.2802	-0.3979	-0.1374
41 DIPOP	-0.3483	-0.1813	-0.4011	0.6154	1.0000	-0.4835	-0.6978	-0.3901	-0.4066	-0.4066	-0.3791	-0.2747
42 DENRAD	0.6099	0.0604	0.0165	-0.1484	-0.4835	1.0000	0.7198	0.3132	0.3516	0.4231	0.4835	0.3352
43 DENRADA	0.5667	0.2193	0.1703	-0.2198	-0.6978	0.7198	1.0000	0.4231	0.4505	0.4780	0.5604	0.4341
44 CIRTON	-0.0055	0.1209	0.2857	-0.3846	-0.3901	0.3132	0.4231	1.0000	0.9670	0.8352	0.8901	0.8297
45 CIRDOM	0.0522	0.2308	0.2637	-0.3681	-0.4066	0.3516	0.4505	0.9670	1.0000	0.8571	0.8791	0.7582
46 TONSIL	-0.0027	0.0495	0.3846	-0.2802	-0.4066	0.4231	0.4780	0.8352	0.8571	1.0000	0.8791	0.8264
47 TONDOM	0.1703	0.2308	0.1429	-0.3979	-0.3791	0.4835	0.5604	0.8901	0.8791	0.8791	1.0000	0.8956
48 DIJ	0.1126	0.1374	0.0769	-0.1374	-0.2747	0.3352	0.4341	0.8297	0.7582	0.8264	0.8956	1.0000
49 DEMAND	0.5962	0.1484	0.1264	-0.1923	-0.6044	0.5791	0.7308	0.7363	0.3352	0.4650	0.3846	0.0934

SPEARMAN CORRELATION MATRIX

	VARIABLE	49
1	TRIBE	-0.0659
2	DISTCAR	0.0973
3	DOMCAR	-0.1923
4	MALECAR	-0.3352
5	FEMCAR	-0.2363
6	FEEDERS	0.1367
7	LINKVERTS	0.8736
8	LINKMEAN	0.8791
9	TONACCESS	0.4451
10	DOMPOP	0.6754
11	TOWPOP	0.8904
12	LITERACY	0.2734
13	TOWNS	0.6734
14	AGPOP	0.5714
15	AREA	0.0769
16	UPLAND	-0.3723
17	SWAMP	0.0276
18	FARM	-0.0726
19	ROADS	0.6814
20	DOMSERVE	0.7473
21	TOWSERVE	0.7308
22	TIMEX	0.5333
23	TIMET	0.7507
24	TIMED	0.1030
25	TRAVEX	0.0440
26	TRAVET	0.2253
27	TRAVED	0.0999
28	SCHOOLS	0.4560
29	MEDICAL	0.8104
30	POSTS	0.6346
31	BANKS	0.7802
32	ADMIN	0.6305
33	RECREATION	0.7679
34	DEVELOP	0.3159
35	RELIGION	0.6576
36	DRAD	0.0165
37	DISTAP	0.5962
38	PIKET	0.1494
39	PA	0.1264
40	DA	-0.1923
41	DIPOP	-0.6044
42	DENRAD	0.8791
43	DENRADA	0.7308
44	CIRTON	0.2363
45	CIRDOM	0.3352
46	TONSIL	0.4890
47	TONDOM	0.3846
48	DIJ	0.0934
49	DEMAND	1.0000

Appendix 6.1. Six highest correlations by variables.

	Variable	Variable of Highest Correlation.	Value	2nd Highest Correlation.	Value	3rd Highest Correlation.	Value	4th Highest Correlation.	Value	5th Highest Correlation	Value	6th Highest Correlation.	Value.
1	Percentage of dominant tribe.	15	0.429	13	0.373	16	0.369	10	0.313	36	0.307	32	0.293
2	% Chiefdom to District CAR.	14	0.912	10	0.896	31	0.849	11,49	0.698	29	0.694	42	0.676
3	CAR for Chiefdom.	5	0.962	24	-0.916	27	-0.901	25	-0.896	48	-0.890	47	-0.879
4	CAR (males).	12	-0.809	3	0.764	43	-753	5	0.665	41	0.648	24	-0.633
5	CAR (females).	3	0.962	24	-0.872	27	-0.857	25,24	-0.846	48	-0.841	45	-0.830
6	Seasonal feeder roads.	37	0.511	34	0.459	23	-0.441	26	-0.424	17	0.411	11	0.350
7	Chiefdom Town Link demand.	8	0.962	43	0.929	49	0.874	35	0.846	42	0.841	20	0.830
8	Chiefdom Link Demand.	7	0.962	42,49	0.879	35	0.854	43	0.852	20,29, 31.	0.830	32	0.823
9	Chiefdom Town accessibility. ($d_{[ip,ij]}$).	46	0.962	47	0.956	45	0.890	44	0.879	23	0.835	3,5	-0.824
10	Population (1963) Chiefdom.	31	0.923	2	0.896	32	0.828	20	0.780	13	0.778	35	0.772
11	Population (1963) Chiefdom Town	42	0.907	49	0.890	21	0.830	31	0.789	29	0.758	37	0.747
12	% Literacy in English (1963).	4	-0.809	43	0.669	30	0.650	44	0.644	3	0.636	45	0.631
13	Settlements > 500 (1963).	32	0.920	35	0.854	8	0.821	20	0.813	30	0.809	31	0.793
14	Agricultural Population (1963).	2	0.912	10	0.736	15	0.692	31	0.635	36	0.604	29,28	0.571
15	Area.	39	-0.802	14	0.692	16	0.620	36	0.560	18	0.529	2	0.517
16	Land > 500 ft. high	18	0.846	15	0.620	30	0.592	12	-0.573	45	-0.551	43	-0.543
17	Land < 200 ft. high	19	0.588	39	-0.495	28	0.445	18	-0.427	30	0.426	20	0.418
18	Land 200ft. - 500 ft. high	16	0.846	45	-0.636	5	0.628	44	-0.609	3	0.587	30	-0.540
19	Motorable roads (miles).	28	0.747	2	0.643	10	0.626	20	0.615	17	0.588	32	0.571
20	Service Stores (Chiefdom).	30	0.915	31	0.887	35	0.876	32	0.872	42	0.835	7,8	0.830
21	Service Stores (Chiefdom Town).	11	0.828	42	0.769	29	0.753	49	0.731	33	0.718	31	0.676
22	Time-Space Convergence(1900-1925).	21	0.582	29	0.541	49	0.533	2,14	0.517	10	0.500	33	0.482
23	Time-Space Convergence(1925-1955).	26	0.995	47	0.846	9	0.835	27	0.780	48	0.775	46	0.764
24	Time-Space Convergence(1900-1955).	25	0.938	27,48	0.933	3	-0.916	5	-0.872	47	0.856	44	0.817
25	Travel Time (1900).	27,48	0.995	24	0.938	3	-0.896	47	0.874	5	-0.846	44	0.824
26	Travel Time (1925).	23,25	0.995	47	0.835	9	0.819	27	0.786	48	0.780	25	0.764
27	Travel Time (1955).	25	0.995	48	0.989	24	0.933	3	-0.901	47	0.890	5	-0.857
28	Educational Services.	20	0.819	19	0.747	30	0.739	37	0.728	31	0.684	32	0.677
29	Medical.	42	0.901	20	0.879	31	0.861	8	0.830	49	0.810	30	0.787
30	Telecommunications, Posts.	20	0.915	32	0.860	35	0.819	13	0.809	7	0.794	29	0.787
31	Commerce, Banks.	10	0.923	42	0.890	20	0.887	29	0.861	2	0.849	8	0.830
32	Administration.	35	0.929	13	0.920	20	0.872	30	0.860	10	0.828	8	0.823
33	Recreation.	31	0.780	49	0.768	21	0.718	10	0.702	29	0.699	11	0.685
34	Government and Mission development.	30	0.650	29	0.611	20,29	0.611	28	0.607	21	0.563	42	0.558
35	Religion.	32	0.929	20	0.876	13,8	0.854	7	0.846	30	0.819	31	0.787
36	$\bar{d}_n/\bar{d}_A$.	14	0.604	38	0.588	15	0.560	2,39, 48	±0.385	5	0.379	27	-0.346
37	$\bar{d}_A/\bar{d}_p$.	11	0.747	28	0.728	20	0.629	31	0.613	42	0.610	7,49	0.596
38	r_I/r_E.	39	0.615	36	0.588	35	0.459	37	0.456	15	0.445	17	0.376
39	Boundary/Area.	15	-0.802	38	-0.615	40	0.588	19	-0.541	17	-0.495	16	-0.452
40	$\bar{d}_A$.	41	0.615	39	-0.588	19	0.470	15	0.396	44	-0.385	28,45	±0.368
41	$\bar{d}_p$.	43	-0.698	4	0.648	40	0.615	49	-0.604	7	-0.577	12	-0.545
42	Population density 1mile from Main town.	11	0.907	29	0.901	31	0.890	8,49	0.879	.7	0.841	20	0.835
43	Population density 2 miles from Main town.	7	0.929	8	0.852	4	-0.753	20	0.742	35	0.736	49	0.731
44	Circuity, Chiefdom. town, all vertices.	45	0.967	47	0.890	9	0.879	3	-0.857	5	-0.846	27	0.841
45	Circuity , Chiefdom towns.	44	0.967	9	0.890	47	0.879	46	0.857	3	-0.841	5	-0.830
46	d(ip,jp) Town vertices.	9	0.962	47	0.879	45	0.857	44	0.835	23	0.764	26	0.742
47	d(ip,jp) Chiefdom Population.	9	0.956	48	0.896	27,44	0.890	3,45 46	±0.879	25	0.874	24	0.856
48	d(i.j) Town vertices	25	0.995	27	0.989	24	0.933	47	0.896	3	-0.890	5	-0.841
49	Link demand, Chiefdom towns.	11	0.890	8,42	0.879	7	0.874	29	0.810	31	0.780	33	0.768

APPENDIX 6.4. A CLASSIFICATION OF VARIABLES BY SCORES IN FACTOR MATRIX

A. 1.0 - 1.5. Variable.	Low.	Description.	B. 1.51 - 2.0 Variable.	Medium.	Description.	C. 2.0 Variable.	High.	Description.
FACTOR I								
21	1.386	Service Score(Chiefdom Town).	11	1.192	Chiefdom Town - Population).			
28	1.313	Education.	8	1.904	Link demand (Chiefdom)			
20	1.265	Service Score(Chiefdom).	7	1.901	Link demand(Chiefdom town).			
6	1.214	Seasonal feeder roads.	34	1.884	Govt. & Mission development.			
13	1.146	Settlements >500.	42	1.856	Population density.			
37	1.123	$\bar{d}A/\bar{d}p$.	49	1.837	Link demand			
33	1.022	Recreation.	12	1.638	% Literacy.			
			31	1.551	Commerce, banks.			
			43	1.542	Population Density.			
			30	1.533	Telecom. & Posts.			
FACTOR II								
17	1.499	Land < 200' high.	40	1.884	$\bar{d}A$.	16	2.49	Land >500' high.
19	1.302	Motorable roads.	41	1.76	$\bar{d}p$.	18	2.427	Land 200' - 500' high.
31	1.294	dr/dA(shape).	5	1.734	CAR(female).	6	2.411	Seasonal feeder roads.
4	1.284	CAR(male).	3	1.508	CAR(Chiefdom).	15	2.403	Area.
38	1.147	$I/^2E$(shape).						
FACTOR III								
47	1.446	Accessibility.	4	1.833	CAR(male).	39	2.788	Boundary/area.
13	-1.424	Settlements - >500.	24	1.777	TSC(1900-1955).			
26	1.412	Travel Time,1925.	25	1.704	Travel Time(1900).			
3	1.355	CAR(Chiefdom).	48	1.664	Accessibility.			
23	1.345	TSC(1925-1955).	27	1.591	Travel Time,1955.			
17	-1.301	Land< 200 feet.						
19	-1.261	Motorable roads						
38	1.258	$I/^2E$(shape).						
9	1.193	Accessibility						
46	1.099	Accessibility.						
36	1.02	dr/dA (shape).						
FACTOR IV								
39	-1.206	Boundary/Area.	44	1.797		17	2.801	Land < 200 ft.
34	-1.712	Govt.& Mission development.	35	1.76		13	2.669	Settlements >500.
29	1.12	Medical.	45	1.692				
11	- 1.043	Population (Chiefdom town).	19	1.57				
5	1.027	CAR(female).						
FACTOR V								
45	-1.304	Circuity.	16	1.868	Land - 500 ft.	22	2.677	TSC (1900-1925)
23	1.276	TSC(1925-1955).				14	2.429	Agricultural Population.
19	1.239	Motorable roads.				2	2.337	CAR chiefdom).
44	-1.127	Circuity.				6	-2.31	Seasonal feeder roads.
						10	2.114	Chiefdom population.
						17	-2.059	Land < 200 ft.
FACTOR VI								
39	-1.43	Boundary/Area.	17	-1.77	Land<200 ft.	29	-2.751	Medical.
8	1.316	Link demand.	18	1.696	Land 200 - 500 ft.	6	-2.386	Seasonal feeder roads.
7	1.293	Link demand.				16	2.241	Land - 500 ft.
15	1.194	Area.				34	-2.075	Govt.& Mission development.
21	-1.206	Basic Services.						
5	-1.1	CAR(females)						
19	-1.075	Motorable roads.						
49	1.005	Link demand.						

APPENDIX 6.5 GROUPING OF CHIEFDOMS BY LINKAGE

Linkage between Gbanti and Sanda/Loko
Matrix distance sum = 348212·56
Distance of link = 1601·16.

Linkage between Makari and Gowahun
Matrix distance sum = 305534·06
Distance of link = 2214·53.

Linkage between Gbanti and Tenraren
Matrix distance sum = 258861·94
Distance of link = 2357·59.

Linkage between Gbanti and Makari
Matrix distance sum = 216893·81
Distance of link = 2480·18.

Linkage between Libeisaygahun and Sellalimba
Matrix distance sum = 178472·31
Distance of link = 2538·33.

Linkage between Gbanti and Safroko
Matrix distance sum = 142381·81
Distance of link = 2579·95.

Linkage between Magbaimba and Masabong
Matrix distance sum = 111720·69
Distance of link = 3108·89.

Linkage between Gbanti and Libeisaygahun
Matrix distance sum = 80581·69
Distance of link = 3249·82.

Linkage between Gbanti and Magbaimba
Matrix distance sum = 57189·10
Distance of link = 3247·29.
Linkage between Biriwa and Gbanti
Matrix distance sum = 35868·08
Distance of link = 4011·22.

Linkage between Biriwa and Sebora
Matrix distance sum = 19441·44
Distance of link = 5269·73.

Linkage between Biriwa and Tambakha
Matrix distance sum = 5772·21
Distance of link = 5772·21.

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Fig. 3·1