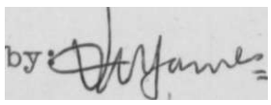
LAND PRESSURE AS A MAJOR CONSTRAINT IN RURAL DEVELOPMENT. A CASE STUDY OF VUNJO WEST DIVISION-MOSHI DISTRICT-TANZANIA.



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"A thesis submitted in "part" fulfilment for the degree of Masters of Arts (Planning) in the University of Nairobi".

DEPARTMENT OF URBAN AND REGIONAL PLANNING.
UNIVERSITY OF NAIROBI.

JUNE 1979

"This thesis is my original v/ork and it has not been presented for a degree in any other University".

This thesis has been submitted for examination with our approval as University Supervisors.

Dr. Y. Okulo Epak.

ACKNOWLEDGEMENTS

I would like to acknowledge the Ministry of Lands, Housing and Urban Development, Dar-es-Salaam, Tanzania for paying for my tuition and stay at the University of Nairobi,

I gratefully acknowledge my debt to the lecturers in the Urban and Regional Planning Department for their encouragement which enabled me to undertake the study.

My sincere thanks are due to Dr. Y. Okulo-Epak, my supervisor whose advice and guidance has helped me accomplish this work.

I also thank Kilimanjaro regional and district officials together with Vunjo West division officials for availing to me some of the data and information I needed for the study.

Special thanks also go to the people of Vunjo West division who sacrificed part of their time to answer the questions in my questionnaire.

Finally my gratitudes to Miss Dorothy Loko Mututo who sacrificed her valuable time to type this thesis.

V.M. JAMES

ABSTRACT

This study has found out that the problem of land pressure in Vunjo West division does exist and its cause is mainly rural overpopulation. In this division, the existing population exceeds the capacity population based on the concept of land carrying capacity of the area.

Furthermore, it has also been found out that Vunjo West division is mainly dependent on an agricultural economy geared mainly to the production of subsistence food crops such as bananas, beans, maize, vegetables and sweet-potatoes. Coffee has also been found to be the only cash crop and major source of peoples income.

Inter-planting of coffee, bananas, maize and beans has also been found to be the common farming practise. This farming practise has been found to be partly due to inadequate usable land and partly due to other factors such as saving of farm labour per plot, type of farming technology used, and the type of crops commonly grown which render themselves possible to inter-planting. Sub-division of plots to sons once they marry is also a common traditional practise.

In respect to all this, the main strategies to resolve the problem of land pressure and the related ones are firstly introduction of rural transformation programmes which will incorporate an agricultural development strategy^ through land use reform programme.

Another strategy is the introduction of resettlement schemes and Social Welfare development programme involving educating the rural people on family planning.

However, since land is the most limited resource, all attempts towards resolving the problem of land pressure would depend on the extent to which population growth rates could be controlled.

TABLE OF CONTENTS:

•Mcit of maps;

1.	Kilimanjaro region	National Context.
2.	Kilimanjaro region	Administrative Units.
3.	Moshi district	Administrative Units.
4.	Vunjo West division	Physical features. v
5.	Vunjo West division	Ecological zones. c'
6.	Vunjo West division	Soil characteristics. ^
7.	Kilimanjaro region	Mean annual rainfall.
8.	Vunjo West division	Existing settlement pattern. <
9.	Vunjo West division	Population distribution.——
10.	Vunjo West division	Population density, is
11.	Vunjo West division	Existing land use. *
12.	Vunjo West division	Transportation network.
13.	Vunjo West division	Distribution of services and earmarked development projects.

•Mat of tables

•piflt of fibres:

A north-South Gross-section of Vunjo West division.

2. Sketches of homestead's development in Vunjo West division.

3. Settlement patterns (sketches) before re-organisation.

4. Settlement patterns (sketches) after re-organisation.

5. Alternative settlement pattern - models.

6. Inputs on modern farming technique.

I

CHAPTER ONE

INTRODUCTION

<u>tement of the problem:</u>

Kilimanjaro region is one of the densely settled regions in Tanzania and has been experiencing the shortage of land progressively. "It was during the 20th century when land pressure began to increase substantially in the region. For instance farm size in the highlands which is the mostly settled, fell from 2.2. hectares per household in 1921 to 0.5. hectares per household in 1967'"

Actually the government has been very much concerned with the problem mostly because this problem has led into serious constraints in terms of development, not only in Kilimanjaro region, but also in areas with similar ecological backgrounds, but yet facing similar problem. The seriousness of the problem can be seen in the ht that the response to such a problem has in most areas^been that the former fallow grazing areas in the highlands have come under permanent utilization; steep river banks have been interplanted with coffee and bananas and more marginal areas of land in both highlands and lowlands have been put under cultivation, an increase in farm plot sub-division among the number of sons one has, destruction of natural pockets of forest along river valleys and this has led into soil erosion in some areas and also drying of some streams which were previously permanent. Secondly due to this land pressure problem, it is difficult to provide any infrastructural facilities

and services to the rural population in the division without having to slice part if not the whole of someones piece of land, whereby in doing so one requires compensation.

Land pressure has definitely led into low productivity per household because the land utilisation techniques have always remained simple and traditional. With such a situation it means that given the high rates of rural population increase, there will inevitably be a redundant labour, which will in turn imply under employment or disquised employment. This will also suggest that the working population is excessive particularly so given the fact that the farming techniques, have upto now not changed significantly.

Consequently it has been the governments policy to resettle people from the over populated rural areas to others which are relatively under-populated. Secondly it has also been government's policy to resettle the excess population in a region into Ujamaa villages whereby they could be provided with enough land to earn them their living and have their activities done on Ujamaa basis. For instance on 22-8-1978, already 125 families from Kilimanjaro region had moved into Kilombero in Kilosa district, Morogoro region, and 5,000 more families from the same region were expected to have moved to the same region by the end of 1978.

But given the peoples customs and adherence on individual holdings which in fact reflects the mere spreading of the traditional agrarian system over a new settlement, it only

are not going to be a worked out

MAP NO 1

INTERNATIONAL BOUNDARY

REGIONAL BOUNDARY

DISTRICT BOUNDARY

---- WATER BODIES

KILIMANJARO REGION

TRUNK ROADS

^M4^ RAILWAYS

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it in the area and when?

means that if there are not going to be a worked out strategies to increase productivity by realising higher yields per household farm size, then the whole government efforts will be as less rewarding as if there hadn't been any move at all.

Thus arising from the above controversy it becomes very essential that for any Tanzanian policy maker and planner dealing with such a situation should incorporate in his/her consideration such relevant questions as follows:-

(a) What the magnitude of the problem of land pressure and rural development is in Tanzania as a whole and the study area in particular^.

(b) What the high rate of land pressure mean to the economy of the Country and the young energetic labour force in the rural areas.

(c) What would be the appropriate policy as regards land, population and rural development.

(d) What are the causes and consequences of land pressure.

(e) In what ways do these factors affect the quality of life of the people as regards to standards of living, the environment health, mutrition and the productivity of the people.

(f) What carrying capacity in terms of the available and potential resources is in the Vunjo West division.

(g) What will be alternatives for future development in the area.

(h) To what extent outmigration will help in bringing development in the area and when?

(i) What level and type of technology is people facing land pressure problem are unable to adopt for development.

It is in view of such questions that concrete and realistic answers to them will form the theme of my study.

Si pjnificance of the Problem:

The problem of land pressure and its resultant effects poses serious constraints as regards rural development. This may result into serious environmental destruction such as cultivating steep sloi|s, destroying the natural pockets of forests along river valleys thereby causing soil erosions and furthermore, further subdivision of the already inadequate farm plots, per household. As population increases on a given limited land resource, the land available for cultivation also decreases, with plots also decreasing in size.

The sub-division of farm plots results into the individual plots becoming very fragmented and this in turn leads into poor farm management consequenting demage to the environment.

At the same time it is clear that if the environment deteriorates, the carrying capacity will be lowered causing more serious land pressure problems since land will still be the main resource of the rural population. Morever, land pressure may lead into a decline in the national exports since the peasant farmers will conditionally be forced to cultivate more food crops intercropped with few cash crops of which the yield would undoubtedly be very low due to food competition.

W

Also following the land pressure problem is that the standards of living of the rural population may drastically decli[ae] since the farmers may not be able to afford some services due to their little saving if any, and due to the diffi[cul]'[t]y [of] Providing any infrastructural facility without having to acquire somebodys piece of land or part of it which will i[n] "turn calls for compensation. Further still, the land pressure problem will inevitably lead into outmigration of the young and energetic population to urban areas leaving behind the old and less energetic one who can not contribute much in rural development and this tendency will definitely results into acute problems in the urban areas in terms of providing adequate facilities and services.

Hence given such views, the problem of land pressure and its associated consequences are very serious especially with regards to rural development and the general national development. Thus strategies are required for resolving these problems, and the contribution of this study should henceforth be seen in the light of this context.

Ob.iectives and Scope of the Study:

The study is basically concerned with the problems of land pressure and rural development in Vunjo West division with a view to laying down strategies to resolve such problems.

In fact it is practically impossible at this juncture to study all areas experiencing land pressure problem given the financial, time and manpower constraints. Hence in chapter two the study will give a general background of the problem in Kiliman-ja^Q [region as a whole] and then focuses itself in

Vunjo West division as a case study. Vunjo West division has been selected for study because according to the 1975 population profile, it is one of the most densely populated divisions in Kilimanjaro region.

A field survey for Vunjo West division was conducted to evaluate the extent at which land pressure has been a problem in rural development thereby being able to come up with some strategies to resolve it

Hence it is anticipated that the proposals and recommendations which will be put forward in chapter four will act as a guide for the future settlement, land use, environmental planning and measures to increase productivity thereby fostering socio-economic development in the area under study. Although this study focuses mainly in Vunjo West division, it is hoped that the finding proposals and recommendations would be enlightening on aspects which limit significant rural development in other areas of Tanzania having relatively similar environmental and socio-economic conditions.

Assumptions and Limitations:

The first assumption, and the one that has given rise to this study is that a serious problem of land pressure exists in Kilimanjaro region and in Vunjo West division in particular resulting in farm plot sub-division, low productivity per household farm size, cultivation of steepslojfe and river banks and soil erosion in the area. This assumption will be tested through the application of land carrying capacity concept although the concept itself has certain weaknesses.

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According to Kalifa, J.H.M. the carrying capacity concept does not envisage a time when the present forest g^d game reserves will be re-zoned for agricultural purposes, not does it put into consideration the possibility of terracing present day steep lands to avoil them for settlement and other economic purposes. Secondly the concept excludes urban areas as though they are not human settlements which, as a matter of fact, save on land by concentrating people on small piece of land. The second assumption is that land pressure in Vunjo West division is a function of uneconomic land use functions. It is uneconomic because only traditional methods of cultivation are being applied on small and fragmented piece of land to grow coffee and bananas as the main cash and food crops respectively. And if bananas are to act as food crop that can satisfy an average household of five people, then a minimum of one hectare is necessary yet it becomes obvious that the fragmentation is not good and still the bananas can not serve effectively a high density rural area as food crop.

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The third assumption is that outmigration in the area is a result of push factors in the rural area and not due to pull factors in the urban centres. This means that the rural area has no more room for its evergrowing population consequently, the excess population funds itself being pushed out of the rural areas to urban centres mainly, although a few look for settlements in other less densely populated regions.

The last assumption is that the most appropriate strategy in resolving the land pressure problem will be "that one which will be able to come up with practical

poli[c]*[es] addressing themselves to land, population and rural development as regards the present and the future. No matter how sounding such policies could seem to be, effective implementation should be followed by appropriate approaches by well trained extension officers, and also there must be readily available resources for initiating the programmes.

rto-fMnition of important terms:

To begin this section, it is important that one starts by defining the term definition. According to Kalifa, [5] a definition purports to determine the boundaries of a term or a word as used in a certain context.

Land pressure is another term which is synonymous to population pressure or land shortage. This implies that the present habitable land is smaller compared to the existing population and its rate of growth. Hence it can also be said that land pressure is a function of land carrying capacity.

Another term is the land carrying capacity which can be defined as a unit of land holding from which production one can satisfy a certain income level. For the purpose of planning the calculation of land carrying capacity must be based on the assumption that habitable land is the most important natural resource for the livelihood of the rural population.

Carrying Canary! ty is another term which means that capacity of the areas environment, both physical and social, to absorb new growth of all forms. It must be noted here that carrying capacity is not fixed. It is bound to change

through technological improvements to overcome environmental limitations or problems, and it may expand or decline through natural or man-made circumstances.

Habitable land refers to that land which can be used for development. It excludes forests, swamps, game, reserves, national parks, roads, very high and steep mountains, open water, bodies, mining areas and urban areas.

FftiTPi*1 aeve1°T>men,b is here meant to reflect quantitative and qualitative changes which should occur among a given rural population, and the resultant effects must, given time, show a rise in the standards of living and favourable changes in the way of life.

DMethodology:

X Source of data:

As expressed earlier, the objective of this study is to analyse the problem of land pressure and rural development in Vunjo West division. Given the limitations of time and finance, it was not easy to study the problem as it occurs in the entire region, instead Vunjo West division was selected for study.

Most of the time was spent on documentary research and as a result most of the data for this study were obtained from written documents. Most of these were obtained from the offices of Regional and District Development directors; Bureau of Resource Assessment and land use Planning; Regional and District Offices of the departments of the Ministries of Agriculture, Works, Health, Education,

Ifl$_a$ter and Natural Resources and Tourism. The rest of the written documentary data and information were obtained from studies done by other schoolars and the defunct Klimanjaro Native Cooperative Union (KNCU).

A second major source of data and information was the field work conducted in Vunjo West division which included a household survey using questionnaires.

Some information was also obtained through personal and verbal interviews together with my own observations.

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Throughout my research, data and information Collection was done in three main methods.

(1) The first and primary one was through documentary research which aimed at examining relevant documents in government departments. These were the source of statis-
r
tical information that was necessary for the explovation fof the existing situation in the region and in the study area in particular.

(2) The second method was that of questionnaires, copies of which are included in the appendix. These were used in the division during a field survey. The household survey was conducted in Swahili although the questionnaires are written in English.

(3) The third method used was that of personal contact and open interviews with individuals from Moshi district including Vunjo West division and relevant officers from

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J$_{va}$rious departments of the government.

For the household survey, a sample of households which about 10$ of the total households in the division was selected by using systematic randomn sampling technique.

structure of the thesis:

The study has been organized into four chapters and the conclusion. The first chapter deals with the general introductory formalities of the problem. These include statement of the problem, significance of the problem, objectives and scope of the study, assumptions and limitations, definition of important terms and the methodology. And under methodology, there are also sub-sections which give an account as to how the study has been conducted.

Chapter two deals with the analysis of the existing situation. Firstly it gives a histonical background of the region and then physiographic and climatic conditions in the study area and their impact on developments and activities talcing place in the study area. The subsection examines landownership and settlement patterns in the area.

The second section deals with land and population and this takes into account such things as habitable land and activities therein, population density and distribution, then population land carrying capacity, The third section in this chapter deals with land and development. Under this section factors attributing

to rural development with the main focus on land pressure examined. Also infrastructure^, facilities in the area together with some few selected development projects are examined in relation to the problem of land pressure.

Chapter three is concerned with the synthesis of the analysis of chapter two. It is also concerned with finding out spatial models for alternative pattern of development that can optimise development vis-a-vis constraints, alternative farming practice that optimises land shortage, climate, type of crops, farming income and population distribution in the division, and finally spatial model for the development of public utilities based on the other models of spatial pattern of development, population distribution and unit population for the services.

The last chapter deals with proposals and recommendations which if successfully implemented, would help raising the living standards of the people. The proposals and recommendations are structured into specific strategies to achieve the stated goals and objectives.

Finally the study is summarised and concluded. References are given at the end of each chapter, while selected bibliography appears after the conclusion.

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CHAPTER 2

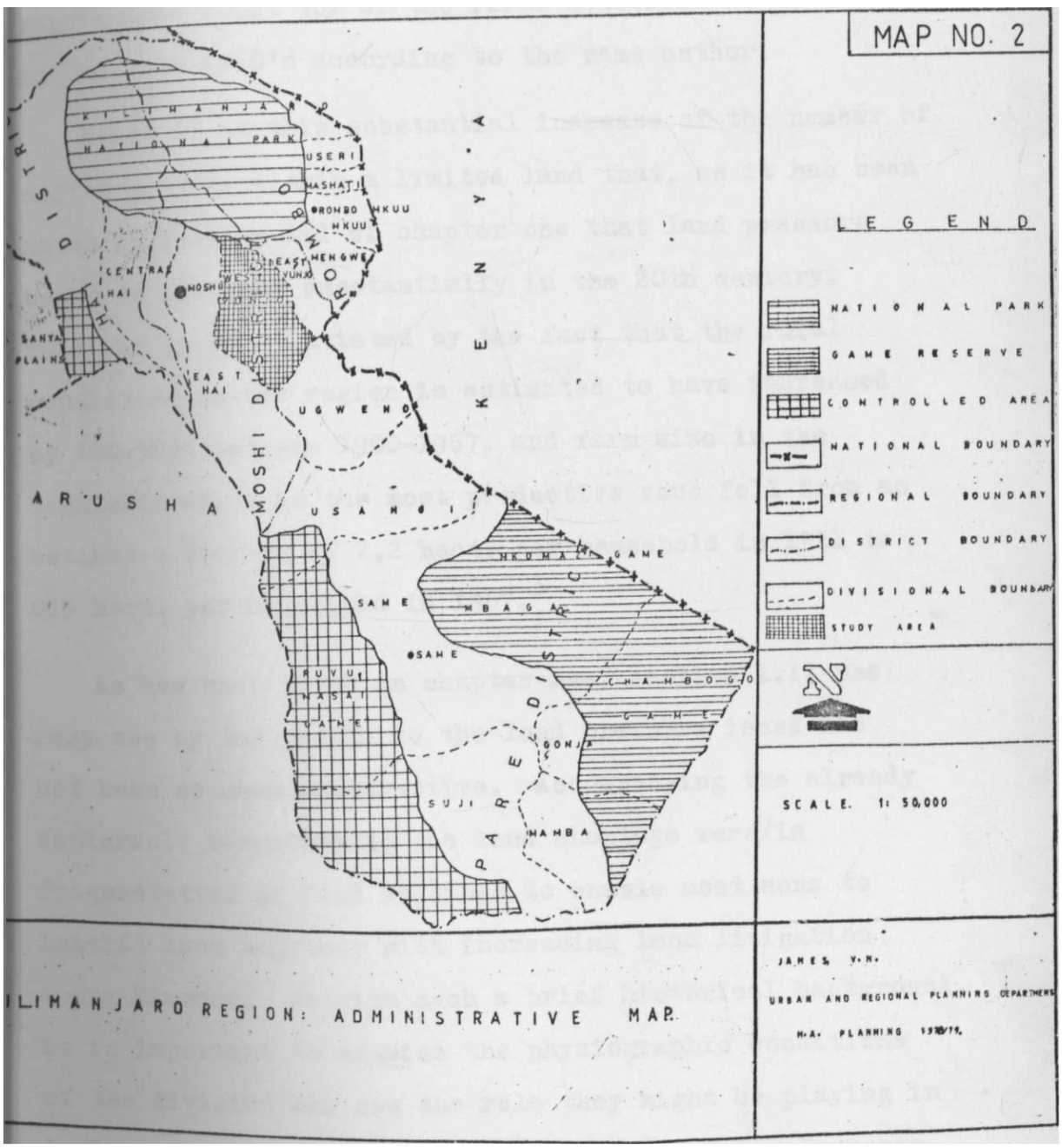
flffftTlYgTS OF THE EXISTING SITUATION

utstORICAL BACKGROUND:

For at least two centuries, Kilimanjaro region has been primarily populated by the members of Chagga tribe who are themselves an amalgamation of several East African tribes who moved into the region over a long period of time Historically, Kilimanjaro region was not under one King or chief during the 19th century, instead it had several chiefs who were continually thriving for power and local domination.

It was during the middle of 19th century when the first European visit to the region took place, but its influence was relatively minimal until in the late 1880's when the Germans began to establish administrative centres and exercise effective control.

Basically being a potentially agricultural region, Coffee which is the main cash crop was introduced by a German Missionary Charles Dundas in 1893; and as it has been observed by Iliffe the first substantial area of African owned coffee was planted in 1900. It was firstly grown by the chiefs and the chiefs clan and later on by the common people. Many people began to plant coffee as their cash crop and after a generally slow beginning, its acreage and production began to expand after 1925. For instance i_n the then Kilimanjaro district which today


MAP NO. 2
KILIMANJARO
NATIONAL PARK
USERI
MASHATI
ROMBO
HKUU
HKUU
MENGWE
EAST
VUNJO
WEST
CENTRAL
HAI
MOSHI
SANYA
PLAINS
EAST
HAI
UGWENO
MOSHI DISTRICT
ARUSHA
KENYA
USANGI
HKUHAI GAME
SAME
MBAGA
SAME
RUVU
MASAI
GAME
CHABOGO
GAME
GONJA
SUJI
MAMBA
PARE DISTRICT
LEGEND
NATIONAL PARK
GAME RESERVE
CONTROLLED AREA
NATIONAL BOUNDARY
REGIONAL BOUNDARY
DISTRICT BOUNDARY
DIVISIONAL BOUNDARY
STUDY AREA
SCALE. 1: 50,000
ILIMANJARO REGION: ADMINISTRATIVE MAP.
JAMES, V.M.
URBAN AND REGIONAL PLANNING DEPARTMENT
M.A. PLANNING 1978/79.

includes Moshi, Rombo and Hai districts, there were according to Br. Maro[2] 3,300 African coffee growers in 1923/24; 16,800 growers by 1933/34; 36,900 growers in 1953/54 and 87,000 growers in the late 1960's. This represented about 90$ of the rural household in Kilimanjaro la the late 1960's according to the same author.

Hence it is this substantial increase of the number of coffee growers within a limited land that, as it has been noted in Section 1.1 of chapter one that land pressure began to increase substantially in the 20th century. This can be substintiated by the fact that the rural population in the region is estimated to have increased by 400-500$ between 1900-1967, and farm size in the highlands which is the most productive zone fell from an estimated average of 2.02 hact. per household in 1921 to 0.5 hact. per household in 1967.

As has been noted in chapter one, section 1.1, the response by the people to the land pressure issue has not been so much constructive. Accompanying the already deplorable responses to the land shortage were/is fragmentation of land holdings to enable most sons to inherit land together with increasing land litigation among Kinsmen. So with such a brief historical background, it is important to examine the physiographic conditions of the division and see the role they might be playing in influencing various types of activities and developments

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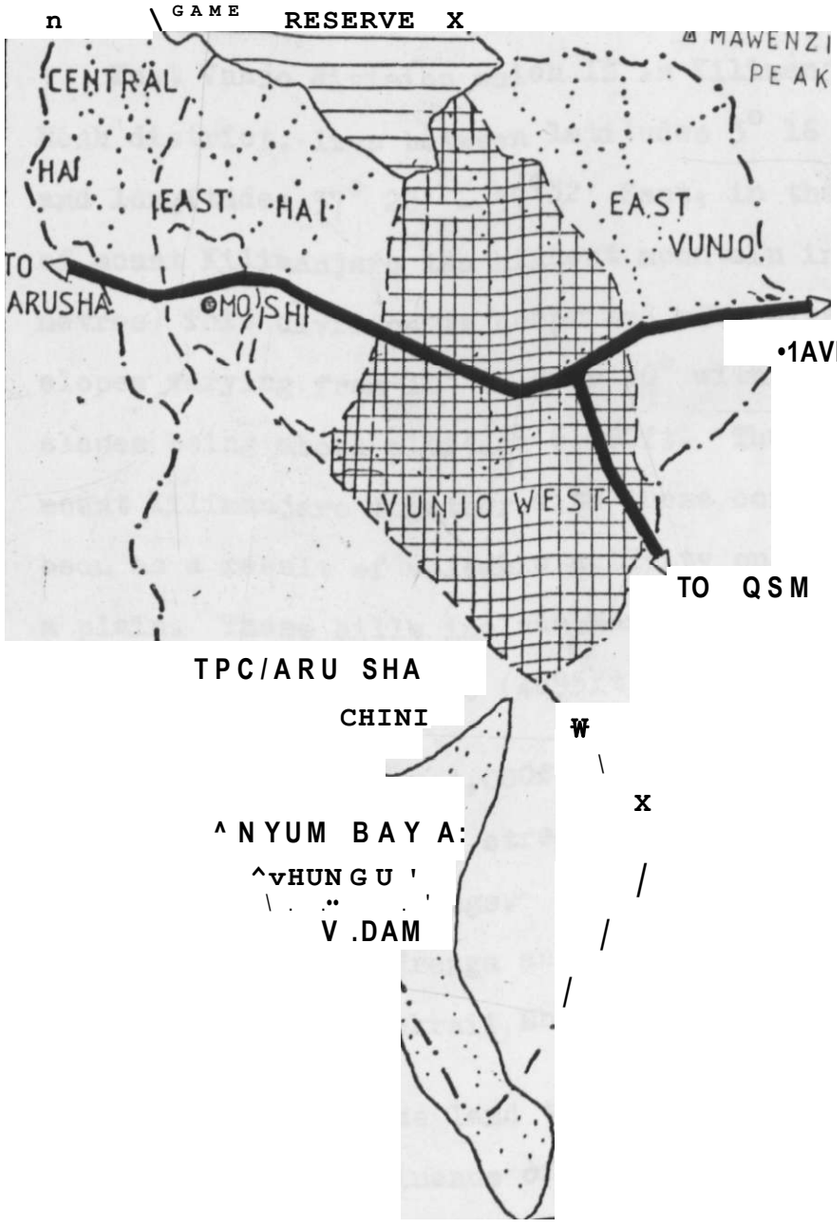

MAP

LEGEND

P—{DISTRICT BOUNDA,

•DIVISIONAL BOUNDARY

WARD BOUNDARY

IJTRUNK ROAD

NATIONAL PARK

STUDY AREA

'••! DAM

Wtxi tflikrk*

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HOSHI DISTRICT: ADMINISTRATIVE MAP

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in the area and later on in the subsequent sections, inter-relate these conditions with the problem of land pressure.

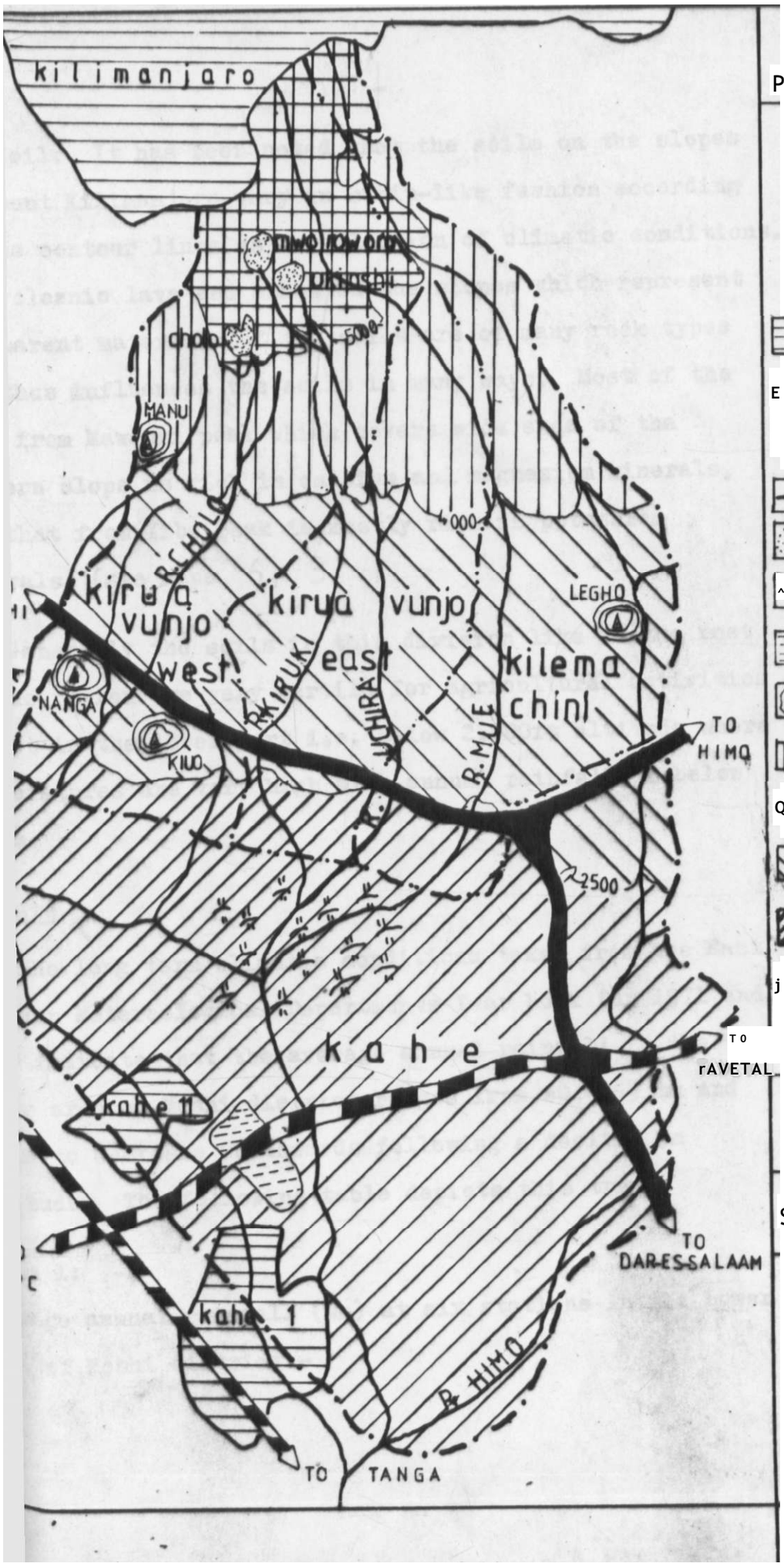
2#0.2. Physiography:

West Vunjo division which is in Kilimanjaro region, Mosh district, lies between latitudes 3° 16 - 3° 30' South and longitudes 37° 22* - 37°32' East, in the eastern slopes of mount Kilimanjaro the highest mountain in African (5895 metres) This division is comprised of conical hills with slopes varying from 10° to over 30° with the steepest slopes being above altitude 6,000ft. The formation of mount Kilimanjaro together with these conical hills has been as a result of volcanic activity on what was previously a plain. These hills include Manu (4-747ft), Kiuo (3027ft), Kifuo (4681ft) and Xegho (4695ft).

Between altitudes 4,000ft-6000ft are perennial and intermittent rivers and streams which are all fed from mount Kilimanjaro springs. The perennial livers are Himo, Uchira, Mue, Urenga and Sau and the intenmittent ones are Cholo, Nanga, Mokraii, Mbosana and Kiruku, (see Map 4)

So generally, the land topography portrays a spectacular scenery with predominance of both steepand gently sloping valleys together with isolated conical hills, (see also figure 2'1)

The geology in this division can generally be described as an impevLous rock of volcanic origin underlying a clay.



PHYISICAL FEATURES*

LEG END:

FORE S T.S

E3 DIVISIONAL BOUNDARY

WARO BOUNDARY

RIVE RS AND STR E AMS

DAMS

^FH MARSHY AREA

SWAMPS

HILLS

AIOVE 5,000ft

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BELOW 2,5 0 0ft

jjjj TRUNK ROAD

RAILWAY

SCALE. 1: ioaooo.

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Sub-Soil, It has been noted that the soils on the slopes of mount Kilimanjaro vary in strip-like fashion according to the contour lines as a reflection of climatic conditions. The volcanic lava and ashes on the slopes which represent the parent materials of the soils are of many rock types and thus influences the soils in many ways. Most of the lava from Mawenzi peak which covers wide area of the eastern slops is rich in calcium and magnesium minerals, and that from Kibo peak is mostly rich in potassium minerals, (see maps 6 j 3 •)

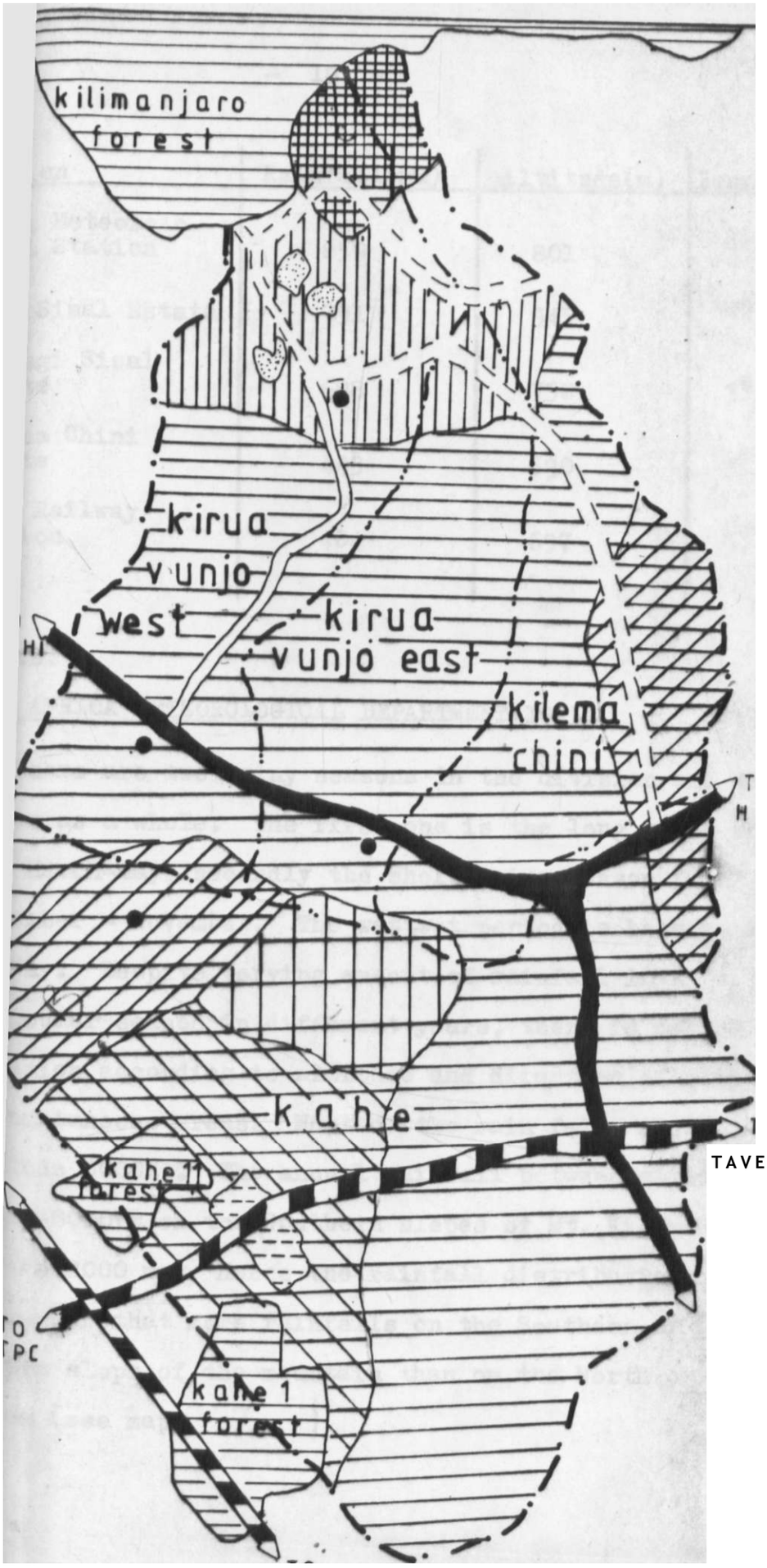
Generally the soils in this division like in the rest of the region are very fertile for agricultural activities except in the lower part i.e. below 2,500ft altitude where temperatures are very high with annual rainfall of below 500mm.

Climate

The long term climatic conditions taken from the East African Metereological Departments Year book for 1971 and 1977 indicate that the average annual rainfall in the lower area of Moshi district ranges from 404-859 mm and tends to decrease Southwards following a decline in altitude. The following table depicts this trend

Table Is

Average annual rainfall (mm) at six stations in the Lower area of Moshi district:-



SOIL TYPES.

LEGEND.

I^.^DIVI SIO-NA L BOUNDARY

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WAR D BOUNDARY

PODSOLIC SOILS'

I LLLI FERRALLITIC SOILS

E=|FERROGENOUS SOILS

|CALAMORPHIC SOILS

[JJHYDROMORPHIC SOILS

BROWN AND R E DDLS H BROWN SOILS

TRUNK ROAD

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E 3 D R Y LEATHER ROAD

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SCALE. 1:100,000.

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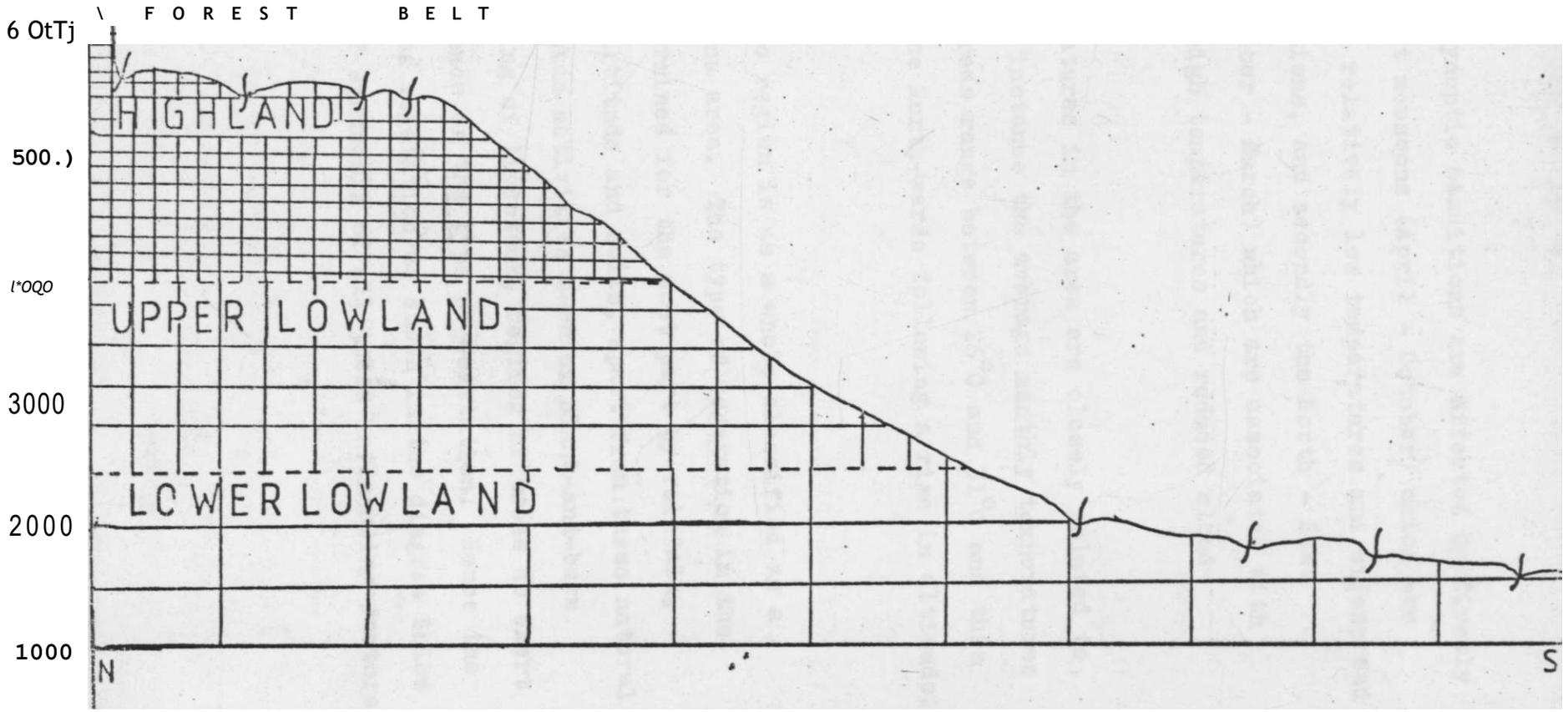
Station	Rainfall(mm)	Altitude(m)	Longitude
Moshi Meteorological Station	859	801	3° 12' South
Himo Sisal Estate	791	945	3° 23' "
Kiyungi Sisal Estate	688	750	3° 24' "
Arusha Chini Estate	449	690	3° 30' »
Kahe Railway Station	404	697	3° 30' "

Sources

EAST AFRICA METEOROLOGICAL DEPARTMENT: 1973

There are two rainy seasons in the division and the region as a whole. The first one is the long rainy seasons from March-May; secondly the short rainy season from September - November, The wettest period is between April and May, Despite varying amount of rainfall in a particular season in different years, there is marked variation according to altitude and direction of slope in mountaneous areas. Most of the rain falls above altitude 3000ft, The annual rainfall between altitudes 6000ft-8000ft on the Southern slopes of Mt, Kilimanjaro exceeds 2000 mm. Hence the rainfall distribution is in the manner that more rainfalls on the Southern or South-eastern slops of the mountain than on the North or Western slopes (see map 7.)



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A NORTH-SOUTH CROSS-SECTION^ VUNJO WEST DIVISION-

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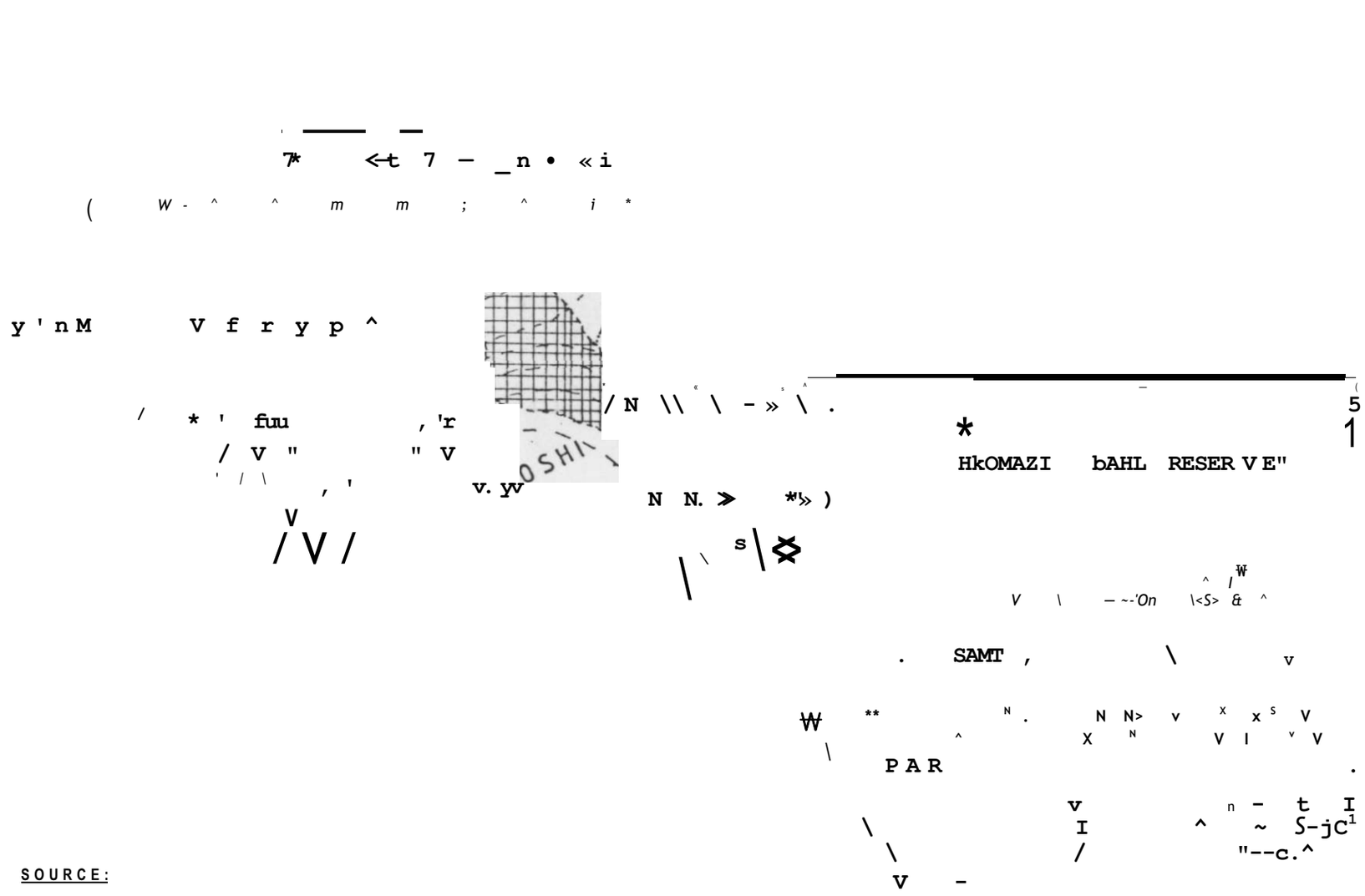
In fact these synoptic conditions are affected by firstly the South - East monsoons (April - October) which are associated with relatively low temperatures and widespread of cloud conditions, and secondly the North - East Monsoons (November - March) which are associated with comparatively high temperatures and reduced cloud conditions.

The temperatures in the area are closely related to altitude. For instance the average monthly temperatures in the lower areas range between 26°C and 31°C and this tend to decrease North-wards following a rise in altitude.

Vegetation:

Kilimanjaro region is as a whole classified as a tropical savanna area. The type of vegetation in the region is determined for the most part by rainfall, temperatures,altitude and soils, apart from these natural conditions, human activities such as alash-and-burn farming, grazing of livestock, felling of trees do exert a great influence on the type of vegetation. Hence the distribution of vegetation as shown in the diagram below is a result of synthesis of all these influencing factors.



\ MAP NO~7

L E G E I D

ONAT.ONAL BOUNDAR'

QRERGIONAL BOUNDARY

|—"ID IS TRICT BOUNDAR'

STUDY AREA

GAME PARKS AND RESE3

|-'j ISOHYTES

SCALE:

0 $"~Tr~iV"7r~2S km.

SOURCE:

KILIMANJARO INTEGRATED DEVELOPMENT PLAN: MAY, 1977-

JAMES, V-H

URBAN AND REGIONAL PLANNING DEPARTMEN

MA- PLANNING 1978/79

KILIMANJARO REGION: MEAN ANNUAL RAINFALL.(MM)

Diagram I:

VEGETATION TYPE:-

Rainfall (mm)		
150	ICE CAP	
	ALPINE MEADOW	
1000-=		THE RECEEDING LINE OP NATURAL VEGETATION
2000—	FOREST	
1000—		
	WOODLAND	Dessertion of cultivated land; felling of trees.
700—		
	WOOIAND AND SCRUBS	
500—		- Excessive slash- and burn farming; Felling of trees; Overgrazing
	THICKETS	
4-00—		
	SCATTERED TR&S	Overgrazing. Overstocked by animals•
	SCRUBS	
300—		

SOURCE;

"Kilimanjaro Intergrated Development Plan"

Interim Report, May 1977

The alpine area is above 10,000ft and has annual rainfall of under 150mm. It has already been designated as a National Park, hence it has escaped the influence of human activities keeping its primeval natural environment intact.

The forest zone lies between 6,000ft-10,000ft. In this zone the vegetation varies considerably because of the differing amounts of rainfall due to different directions of the slopes. A small portion of the forest is being used for commercial purposes, but still the rest consists of primeval forests that have hardly been subjected to any human influence.

Between 4000'-6000' is a zone of villages and cultivated land which has been subjected to the greatest human influence Because of the high dense land use, the primeval vegetation has practically vanished having been replaced by plants raised for production purposes.

Below 3,000ft, there are no forests, woodlands or thickets except for very few places where underground water gushes to the surface. The vegetation found is scattered trees and scrub and this is largely due to repeated slash-and-burn cultivation together with over-grazing. (For further illustration see map 5)

0.3 Land Ownership:

The issue of land ownership in Kilimanjaro region can be historically traced as far back as during the period of tribal wars.

In brief, it was characteristic nature that whenever one tribe went into war with another the defeated one had a. to abondon its land and sought safety somewhere else. In the case of Kilimanjaro region most people preferred living on the highlands for better defensive purposes against any attack.

It was customary that the chief of an area was the one who had the powers of acquiring as much land as he could. Later on that portion of land was settled by the members of his clan. The second group of people who had the opportunity of acquiring a large piece of land were the chiefs assistants who were locally known as "Wachili". This assistants were the main executors and implementors of the policies and decisions made by the chief.

In order for the common man to get a piece of land, he had to apply for it from the chief through his "Mchili" or chiefs assistant. As soon as the application was sanctioned, the applicant was to decide where he wanted the piece of land, and then the chiefs assistant was the one vested with the powers of demarcating the boundaries officially. With this practise there was no fixed acreage

which one was supposed to ask for so long as one had enough money to pay for it.

One thing which ought to be clear is that at this period the main occupation of people was pastoralisim.

However with the coming of the Europeans and the introduction of coffee fanning in the late 1880's, the traditional pastoral farming began to give way to permanent farming of coffee intercropped with bananas and maize. Hence as many people began planting coffee (see sect.2.0.1), more and more land was subjected into permanent cropping and it was from this trend that gradually land began to be a problem as the traditional customs of dividing and sub-dividing farms among sons continued.

Thus, with this historical and traditional customs, land remained purely an individual property as long as there were officially accepted boundaries irrespective of the fact that he was effectively using it or not. Nobody could come and claim it.

But this pattern changed completely with the Arusha Declaration of February, 5, 1967. In this declaration, Land was one among many other things which were nationalised. It was clearly stated in the Arusha declaration that nobody can claim to own land, all land belongs to the nation, and someone can claim that a certain portion of land is his only in as far as he is effectively utilizing it. If one owns a piece of land and he is not utilizing it effectively,

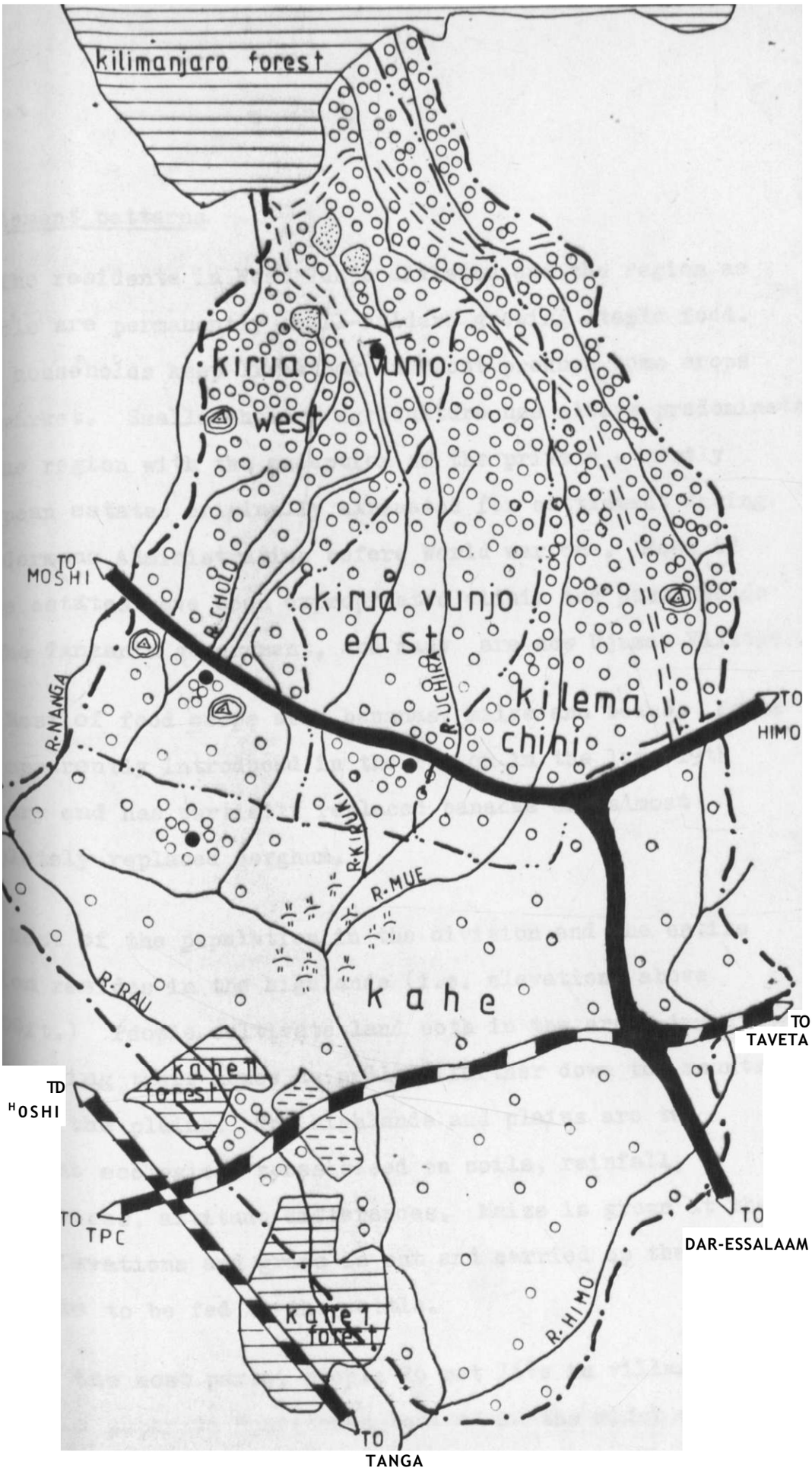
then anybody else has got the right to occupy and utilize! it productively. So since the Arusha declaration of 1967, land has been a national property and in principle nobody owns land, but practically does own it only in as far as he is effectively making use of it.

In the light of these major changes on land, many people in the region began to divide their farms to their sons, so as to make the whole farm look effectively under use. This has in several occassions resulted into smaller and smaller units of land per household and in as far as I am concerned it has facilitated the problem of land pressure in the region.

But despite all this land pressure problem, since land is free to anybody if it is unoccupied or ineffectively utilised, one is free to move to any vacant place and settle.

However, with the introduction of the Ujamaa Villages and planned settlement policy by the government, it becomes obvious that any decision to migrate and settle somewhere else ought to be properly guided to avoid haphazard and scattered settlements which would be contrary to the government's policy of villagillization and Ujamaa villages.

Given this brief description and historical understanding of land ownership in the region and the nation as a whole, it is useful to examine again the settlement pattern of the people and see how even the physiographic conditions discussed above have influenced this pattern.



EXI STING SETTLEMENT PATTERN.

LEGEND

DIVISIONA BOUNDARY

WARD BOUNDARY

TRUNK ROAD

ALL WEATHER ROAD

DRY WEATHER ROAD

RAILWAY

H ILLS

RIVERS AND STREAMS

MARSHY AREA

SWAMPS

DAMS

MARKET CENTRES

HOMESTEADS

SCALE. 1:100000.

JAMES* V. M.
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M-A- PLANNING. 1*78/79

VUNJO WEST DIVISION.

MAP NO-A

Settlement patterns

The residents in West Vunjo division and the region as a whole are permanently small-holders growing staple food. Most households keep livestock and most produce some crops for market. Smaller-holder agriculture has always predominated in the region with the exception of the private - mostly European estates originally alienated for settlement during the Germans Administration before World war one. Most of these estates have been expropriated within the past decade by the Tanzania government, and many are now Ujamaa Villages.

Most of food crops are bananas, maize and beans. Maize was apparently introduced in the region in the late 19th century and has partially replaced bananas and almost completely replaced sorghum.

Most of the population in the division and the entire region resides in the highlands (i.e. elevations above 4,500ft.) People cultivate land both in the areas immediately surrounding their homes as well as further down the mountain towards the plains. The highlands and plains are two different ecological zones based on soils, rainfall, temperatures, altitude differences. Maize is grown at the lower elevations and grass is cut and carried up the highlands to be fed to the cattle.

For the most parts, people do not live in villages, but reside in separate homesteads located in the midst or immediately adjacent to their small coffee and banana farms.

Beans are grown interspersed among the coffee and bananas. Even before European contact, people in the highlands practised terracing and irrigation, applied animal manure to the land, and maintained shade trees for fuel and building materials.

Historically livestock were grazed in the lowlands and highlands, but in this century most of the former grazing lands in the highlands have been converted into permanent cultivation due to increasing land scarcity and stall-feeding of cattle is now common in the highlands.

The following diagram shows rough sketches of homesteads as they historically developed in three periods.

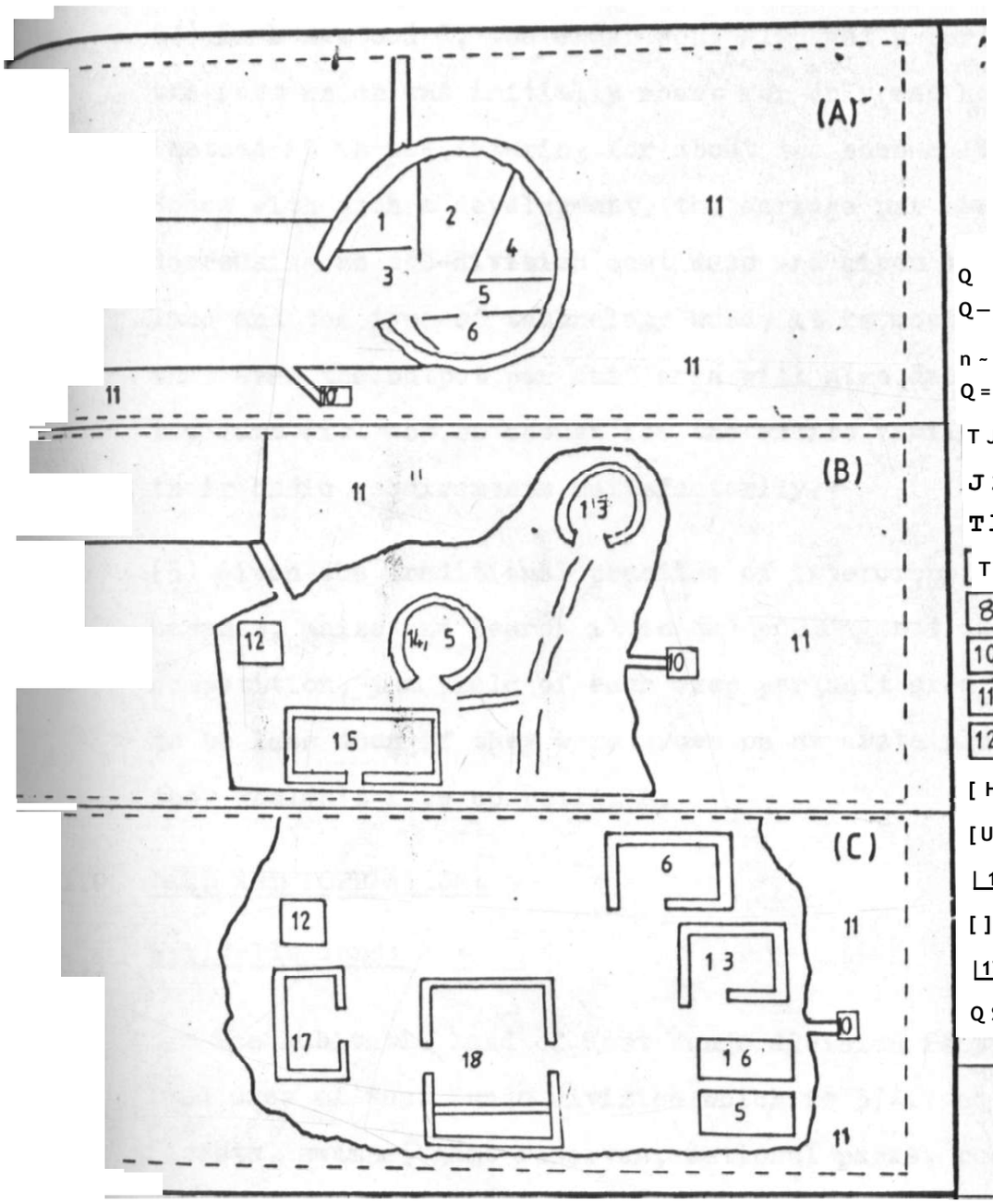
Remarks:

(1) The three types of homesteads reflect various stages of development in terms of housing in the division.

Homestead A shows the traditional type of housing whereas homestead B shows an intermediate housing development. Homestead C shows a relatively modern type of housing.

(2) In all three homesteads, as one changes from the traditional type to the relatively modern one, the space consumed by various structures also increases, consequently a decrease of the cultivable land.

(3) In homestead G, which is the predominant type at the moment, the grazing area has been put into permanent cultivation and instead cattle are now being stall-fed.



L E G E N D

Q PLOT BOUNDARY

Q—jSLEEPING ROOM parent

n~]S LEEPING ROOM children

Q=jcOMMOKI USE

TJJGOATS PEN

J2 COOKING PLACF

TlCATTLE PEN 4

[T]PL AYI NG GROUND

[8] GRAZING AREA

[10] TO IL E T S

[11] COFFEE BA NA NAS

[12] GRAIN STORE

[H]"MOTHERS HOUSE

[U~1CHI LDRENS HOUSE

|15| FATHERS HOUSE

[]T]POUL TRY

|17 JELDER SONS HOUSI

QSJMAIN HOUSE

JAMES, V. M-

SKETCHES OF HOMESTEADS' DEVELOPMENT OEPAR T M E nT oe URBAN AND RE Q IONAL PLANNING HA PL A NN I NG 1

(4-) In homestead C, the elder sons also get a portion of the farm which was initially meant for only one household; instead it is now catering for about two households. Hence with such a development, the acreage per household is decreasing as sub-division continues and given the limited land and the type of technology used, it is most undoubtly that even the output per unit area will also decrease and the farm will not be enough for the entire family to meet their basic requirements satisfactorily,

(5) Given the traditional practise of intercropping coffee, bananas, maize and beans, it is probable that due to food competition, the yield of each crop per unit area is bound to be less than if they were grown on separate plots where they wouldn't face competition.

LAND AND POPULATION?

Habitable land:

The habitable land of West Vunjo division is the total land area of West Vunjo division which is 374.7 sq km. minus forests, swamps, game reserves, national parks, roads, high and steep mountains open water, which reduces it to a habitable land area of 335.2 sq km or 89.4$ of the total area.

These 335.2 sq km of habitable l&nd area are not of equal quality throughout the division for agricultural purpose or livestock grazing. The climatic and physical conditions are the main factors causing such variation in the quality

of habitable land area. By combining the climatic and physical conditions, it has been possible to come up with four major ecological zones. These zones are classified as follows:-

(i) Forest zone
(ii) Coffee-banana zone
(iii) Maize zone
(iv) Mixed farming zone

The forest zone:

This is the zone which lies between altitudes 6,000'-10,000' above sea level. This zone has varying vegetation type due to varying amount of rainfall resulting to the different directions of slope. In this zone only a small portion of it is being used for commercial purposes. This zone has a mean annual rainfall of 2,000 mm.

The Coffee-banana zone:

This is the zone lying between altitudes 4,000'-6,000' above sea level. Basically, this is the zone of villages and cultivated land which has been subjected to the greatest human influence. This zone is sometimes referred to as highland area. This zone has favourable natural conditions for agricultural production. The main crops are coffee and bananas which are major cash and food crops respectively. This zone has annual rainfall exceeding 1000mm, temperatures ranging from 15°-25°C with a slope of 3-8 degrees. This zone has ferrogeneous type of soil with a high clay content

which has developed from basic rock and volcanic ash.

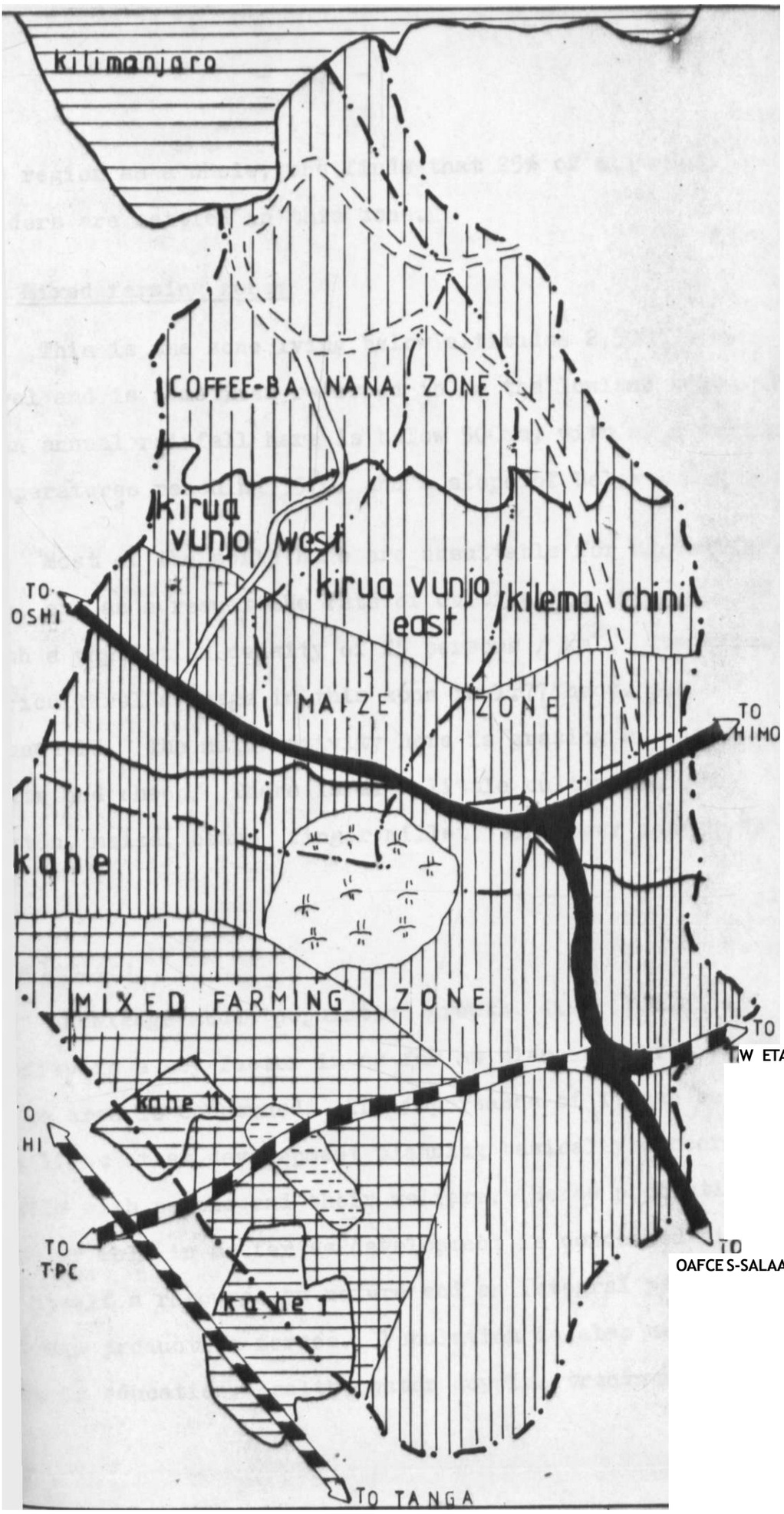
Cultivation and housing in this zone are very dense. For instance according to the Kilimanjaro Integrated Development Plan, the rate of cultivation in this zone is and has population density of 620 persons per sq km and gross agricultural acreage of 0.66 hectares per household. Further more, approximately 65$ of all small holders in the region are settled in this highland area!

Apart from the cultivation of coffee and bananas, there is also stall-feeding of diary cattle.

The Maize zone:

This is the zone lying between altitudes 2,500'-4,000' above sea level and it is sometimes referred to as Upper lowland zone. It has an average annual rainfall of 700mm, with temperatures ranging from 25-30°C and a slope of 1-3*5 degrees. The soil types are similar to those in the coffee-banana zone except that in this maize zone base content is very high which restricts it for the cultivation of coffee and bananas.

In this zone, the rate of cultivation is 35$ and population density is 60 persons/Km^{o} with a gross agricultural acreage of 2.72 hact. per household. Maize cultivation is the main agricultural activity, but other crops such as beans, finger millet are also grown here. Cattle, goats and sheep grazing is also done at a small scale. Taking



ECOLOGICAL ZONES*

LEGJND

^DIVISIONAL BOUNDARY

TOWARD BOUNDARY

^JZONAL BOUNDARY

TRUNK ROAD

ALL WE A T HER ROAD

3 DRY WEATHER ROAD

RAILWAY

FORES T S

^SCATTERED TREES

[HQ SCRUB

THICKET S

IJHAR SHY AREA

SWAH P S

I

SCALE. 1: 100,000

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MAP NO- 5

/UNJO WEST DIVISION.

the region as a whole, one finds that 25$ of all small holders are settled in this zone.

The Mixed farming zone:

This is the zone lying below altitudes 2,500' above sea level and is sometimes referred to as the lowland zone. The mean annual rainfall here is below 500mm, with mean maximum temperatures reaching 35°0. and a slope of below I degree.

Most of the soils here are unsuitable for agricultural use, and as a result the rate of cultivation is only $6_0$0?o with a population density of 25 persons / km^p. The gross agricultural acreage in this zone is 1.77 hact. per household. The main activity here is grazing of cattle, goats and sheep. There is also little cultivation of cotton, maize, beans, finger millet, sunflower and castor oil.

.1.2 Population:

Knowledge about population growth, distribution and density is a key factor in as far as planning for a development of an area is concerned. The importance of it can be seen in the light that development planning basically concerns itself with people and their welfare. Hence population plays a major role in as far as development is concerned since it is itself a resource by nature and an integral part of the nations productive forces. Population do also demand services such as education, health, water supply, transport and many

others, and this implies that for the services to be effective, they must be located where they can be most beneficial to the majority of the people.

The significance of population growth, distribution and density can also be seen in the light that it has to be administered or law maintained. Thus given such a significant role a population study plays, it is clearly necessary to know how it is growing, where people are and how many of them there are, for this is particularly the whole essence of planning and implementation of development programmes.

Population growth:

The following table shows past population growth in the Kilimanjaro district (Now comprising of Hai, Moshi and Rombo districts):-

Table 2.1

Year	Kilimanjaro district
1921	128,443
1928	143,013
1931	155,337
1948	267,700
1957	365,000
1967	503,087
1975	672,711

Source: "Population growth and Agricultural change in Kilimanjaro, 1920-1970" BRALUP Research Paper No.40

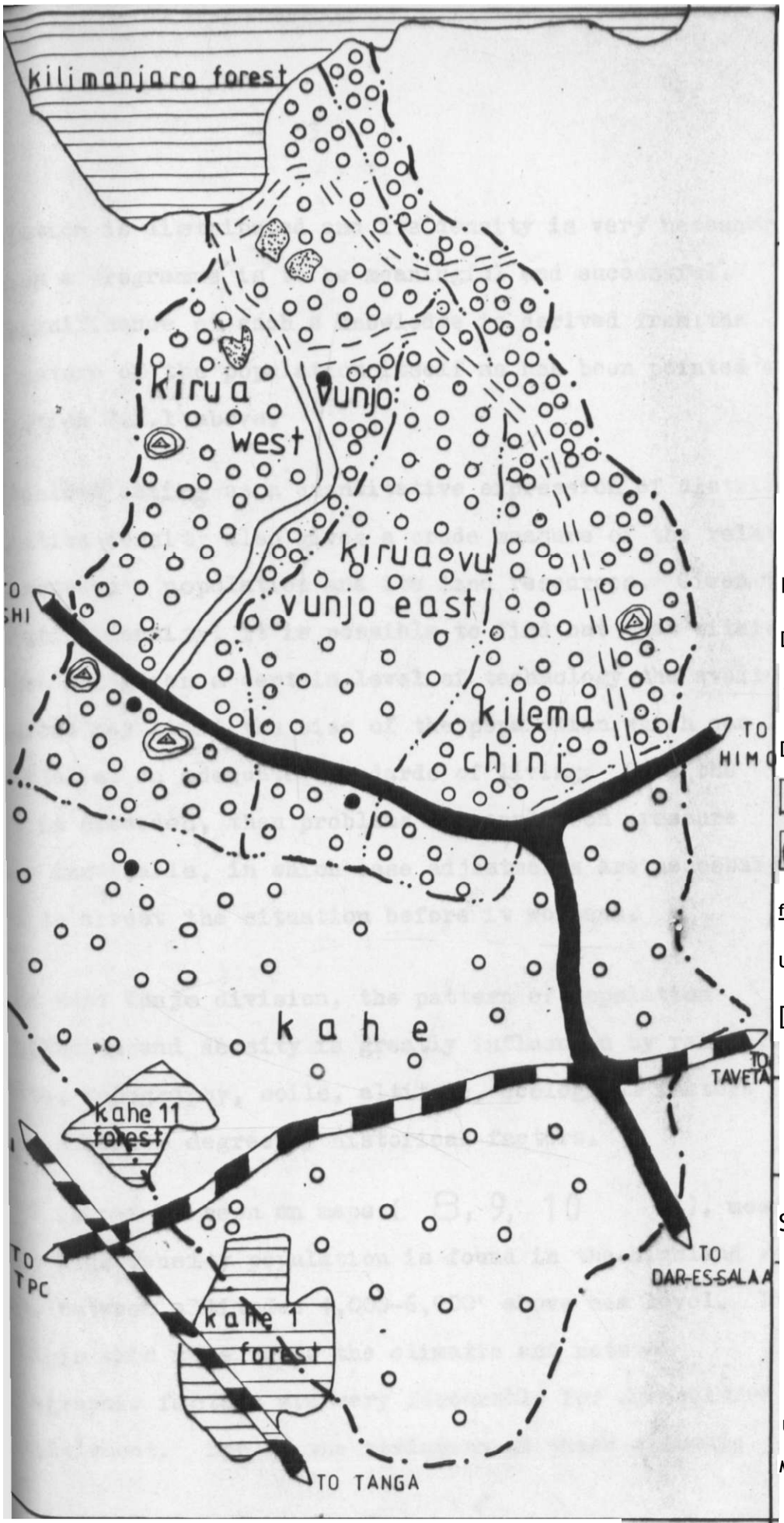
In the above figures the urban population for Moshi town is not included for the years 1921, 1928 and 1931.

Again from the above figures one sees that there has been a 5.2 fold increase in the population of Kilimanjaro district in the past 44 years, and the average annual growth rates of 3.5$, 2.3$ and 3.7$ for the periods 1948-1957, 1957-1967, and 1967-1975 respectively.

Yet one finds that despite all this population increase, the gross agricultural land acreage of 5,309 sq. Km remains fixed. Hence given the limited resources and land in the district compared with the growing population; proper measures for careful land and resource utilization are very necessary so as to strike a balance between population, resource use and development in the area.

Population distribution and density:

Generally population distribution is meant to reflect the way people are found within the divisional area available for them for exploitation and settlement. The population density should be taken as the ratio of a given number of people to a given area of land (i.e. number of persons per sq.. km). As far as planning and implementation of development programmes are concerned, a clear knowledge of the way the



POPULATION DISTRIBUTION

LEG END

—[DIVISIONAL BOUNDA«Y

[INWARD BOUNDARY

[—] TRUN K ROAD

1 1 ALL WEATHER ROAD

[E^IDRY WEATHER ROAD

RAILWAY

HILLS

fe^lOAM S

UPMARKET CENTBES

[o j 1 dot represents 200 people

SCALE. 1: 100/000*

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J'NJ0 - WEST DIVISION.

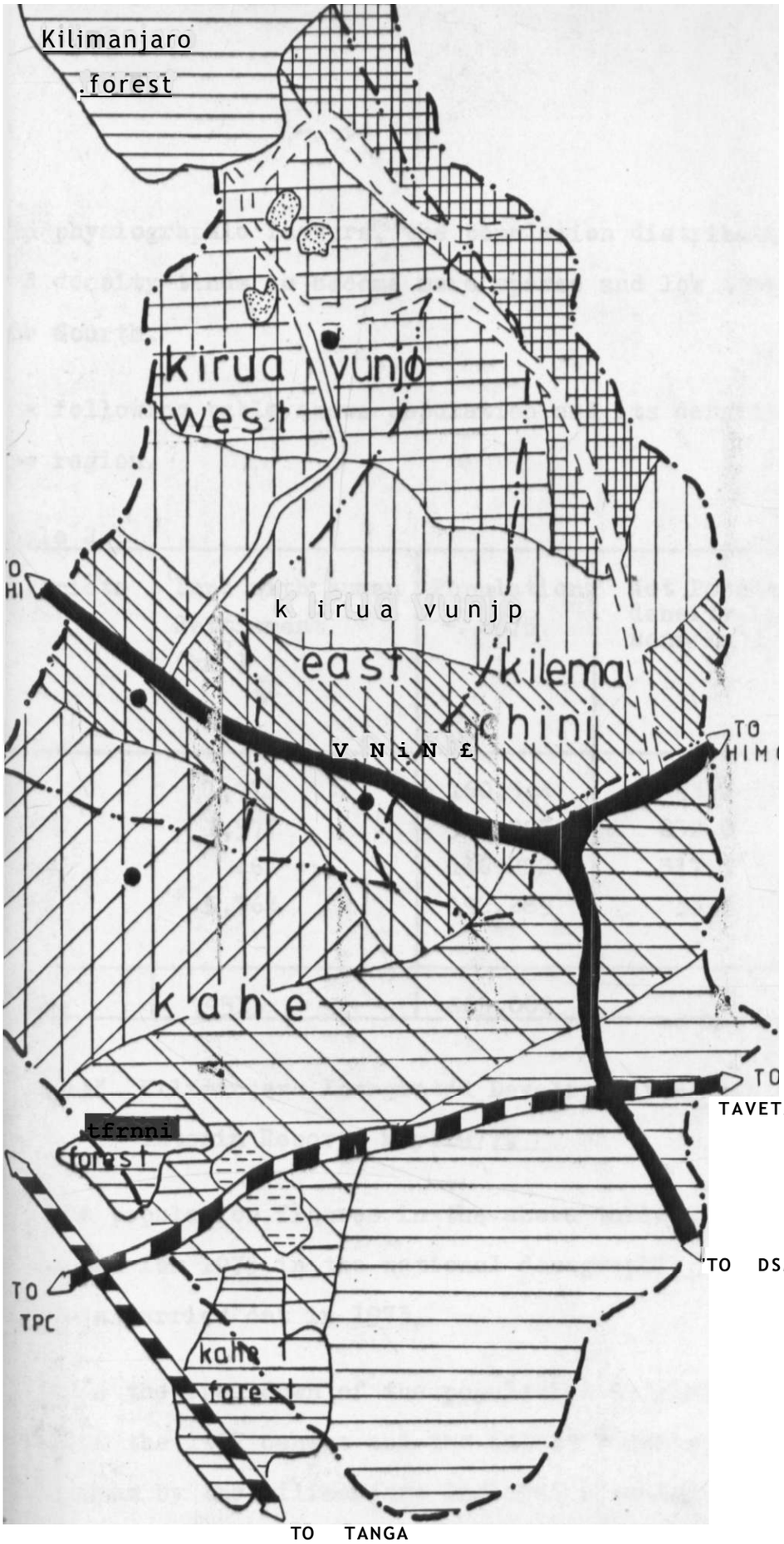
MAP NO-9

population is distributed and its density is very necessary if such a programme is to be meaningful and successful. The significance of such a knowledge is derived from the very nature of the population itself as has been pointed out in Section 2.1.1 above.

Besides acting as a quantitative expression of distribution, population density also gives a crude measure of the relationship between a population and its land resources. Given the population density, it is possible to find out that within an area and given a certain level of technology the available resources may limit the size of the population which can be supported at an adequate standards of living. Once the limit is exceeded, then problems of population pressure become inevitable, in which case adjustments are necessary so as to arrest the situation before it worsens.

In West Vunjo division, the pattern of population distribution and density is greatly influenced by rainfall, climate, topography, soils, altitude, ecological factors and to a lesser degree by historical factors.

As, it can be seen on maps (Q, 9, 1 0)> most of the high density population is found in the highland zone -i.e. between altitudes 4,000-6,000' above sea level. It is within this zone where the climatic and natural physiographic factors are very favourable for agriculture and settlement. Due to the variation of these climatic



POPULATI ON DENSITY

LEGEND.

ABOVE 300

250-300

ITITI 200- 250

150-200

100 — 150

§ 50- 100

BELOW 50

0HARKET CENTRE

DIVISIONAL Bi NCAt,

B WARD BOUNDAH

TRUNK ROA,'

A LL WEATHFC ftKJAI

B RAILWAY

N

SCALE. 1:100,000-

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and physiographic factors, the population distribution and density tends to become more sparse and low towards the Sourth.

The following table shows population and its density in the region.

Table 2.2

Districts	Land with human Settlement (km^2)	Population 1975	Net Population density$_2$(persons/km)	Percent of Total regions Population
HAI	1,711	160,544	93.8	18.6
MOSHI	1,577	365,895	232.0	42.3
ROMBO	461	146,272	317.3	16.9
PARE	5,764	192,289	33.4	22.2
TOTAL		865.000		100

Source:" Kilimanjaro Integrated Development Plan."
Interim Report, May 1977.

The population figures in the above table are those projected for 1975 in the national demographic survey of Tanzania carried out in 1973.

Also the breakdown of the population by district is based on the 1967 census and the latest results of surveys undertaken by the Kilimanjaro Regional Planning unit.

Prom the above table, it can be clearly seen that Moshi district harbours nearly half of the regions total population *

Table 2.3

Population distribution in Kilimanjaro region by zones, 1975:

Zones	Hai district	Moshi	Rombo	Pare	total
HIGHLAND Zone	98,800 (11.4%)	242,800 (28.1%)	97,000 (11.2%)	117,200 (13.6%)	555,800 (64.3%)
UPPER LOW-LAND ZONE	41,900 (4.8%)	113,300 (12.9%)	49,300 (5.7%)	57,400 (6.6%)	259,900 (30.0%)
LOWLAND ZONE	19,800 (2.3%)	11,800 1.4%)	– -	17,700 2.0%)	49,300 (15.7%)
Totals	160,544 (18.6%)	365,895 (42_t?%)	146,272 (16,9%)	192,289 (22,2%)	865,000 (100%)

NB: The percentages are of the total region's population

Source:

Kilimanjaro Integrated Development Plan. Interim Report, May 1977.

Prom the above table (2.3), 50.7% of the total population is concentrated on the highland zone on the scopes of mount Kilimanjaro in Hai, Moshi and Rombo districts. Only 3.7% of the population is found in the lowland zone of the three districts.

By comparing the highland zone population of Moshi district in table 2.2. with the total Moshi district population in table 2.3, it becomes very clear that over 67$ of the district's population is concentrated on the highland zone. This phenomenon as will be demonstrated in the latter Section, implies that certain areas within the district are already experiencing population pressure while others are not.

The population distribution and density in Moshi district do also vary from one administrative division to another, although the district is the most densely populated one in the entire region. As it will be demonstrated in the following table, West Vunjo division is the largest one in terms of acreage apart from TPC/Arusha Chini which is mainly a sugar estate division, but, in terms of total population West Vunjo division ranks the fourth amongst the six divisions in the district. The main explanation as to why West Vunjo division has few people comparatively is due to the fact that a large portion of it is unhabitable as a result of topography and climatic conditions.

Table 2,4

Population Profile of Moshi district by divisions in 1975:

Divisions	Population	No.of households	Population density (persons/ Km2)	Area Km^2)
Central Hai	74,902	12,895	621.6	120.5
East Hai	89,754	12,843	491.0	182.8
Moshi Town	50,000	10,314	1661.1	30.1
TPC/Arusha Chini	4,818	703	8.0	599.5
West Vunjo	58,267	9,260	155.5	374.7
East Vunjc	88,154	12,695	393.2	224.2
TOTAL	365,895	58,709	Y= 555.0	1531.8

Source: Kilimanjaro Integrated Development Plan. Interim Report, May 1977.

NB: In the above table 2.4 the Kilimanjaro National Park and Forest Reserve have been excluded.

As it has been noted earlier that population in the district is not evenly distributed, the samething is within a division itself; and this is mainly due to variations in physiographic and climatic conditions. For West Vunjo division, the unevenness of population density is illustrated in table 2.5 which is divided into four administrative wards.

Table 2.5

Population profile of West Vunjo division by wards in 1975

Wards	Population	No.of household!	Population density (persons/ Km2)	Area (Km^2)
East Kivua Vunjo	9,047	1,235	132.3	68.4
West Ki>ua Vunjo	18,981	2,749	186.6	101.7
Kilema	19,923	2,745	444.7	44.8
Kahe	10,315	2,531	64.6	159.8
Total	58,267	9,260	202.0	374.7

Source: Kilimanjaro Integrated Development Plan. Interim Report, May 1977.

From the above table, Kahe ward has the largest acreage, but with very low population density. This is mainly due to physiographic and climatic conditions prevailing in the area as it is within the lower zone as has been discussed in Section 2.1.1. In contrast Kilema ward which is in the highland zone is the most densely settled one and has the lowest acreage. Again the main explanations are physical and climatic conditions (see Section 2.1.1).

This therefore implies that although the division can overall be experiencing population pressure, some parts or zones of it might be suffering from underpopulation. Hence any development proposals arrived at shall have to "take into account the variations in terms of ecology, Population distribution and density, climate and physiographic

factors in the division. These significant variations call for the need to establish carrying capacities of the divisions, wards and the ecological zones so that areas of serious land pressure can be earmarked. The carrying capacity will help in the type of recommendations which will be made as regards the problem of land pressure in the West Vunjo division.

Land Carrying Capacity?

According to the 1967 population census, 90& of Tanzanias mainlands economically active population depend on agriculture for their livelihood. The agricultural population is almost entively rural though there are traces of agricultural activity in urban areas also. Only 10% of the rural population is employed in the tertiary and secondary sectors.

This therefore implies that an overwhelming proportion of the countries population depend directly on the countrys natural resources especially the habitable land. Hence since habitable land is by far the most important natural resource for the livelihood of the rural population in Moshi district and West Vunjo division in particular, the establishment of land carrying capacities of the various divisions in the districts, wards in the division and the ecological zones in the division is very essential. Carrying capacity here refers to the capacity not only of physical but also social environment which is able to absorb new growth of all forms.

According to the 1967 population census, Kilimanjaro district (i.e. Hai, Moshi, Rombo districts) was one of the ten overpopulated districts in the country experiencing population pressure or land shortage if the accepted income level of 2500/- gross p.a. per standard household of five members was to be met.

Table 2.6

Tanzania by districts: population land ratio and rural population density compared:-

Overpopulated (ratio under 0.80)		Population land-balance (ratio 0.80-1.49)		Underpopulated (ratio 1.50 and over)	
Density Over 25.0 per sq Km	Density Under 25.0 per sq Km	Density Over 25.0 per sq Km	Density Under 25.0 per sq Km	Density Over 10.0 per sq Km	Density Under 10.0 per sq Km
Arusha	Dodoma	Bukoba	Handeni	Bagamoyo	Biharamulo
Kilima-njaro	Iramba	Geita	Kasulu	Karagwe	Chunya
Korogwe	Kondoa	Mziziwa	Kilosa	Kisarawe	Iringa
Lusholo	Mpwapwa	Ngara	Lindi	Mafia	Kahama
Malya/ Kwimba		North Mara	Maswa	Masasi	Kibondo
Mwanza		Rungwe	Mbulu	Mbinga	Kigoma
Newala		Tanga	Musoma	Mbozi	Kilwa
Pemba I		Zanzibar I	Nzega	Morogoro	Manyoni
Shinyanga			Same-Pare	Utwara	Masai
Ukerewe			Singida	Mufindi	Mbeya
				Njombe	Mpanda
				Pangani	Nachingwea
					Rufiji
					Songea
					Sumbawanga
					Tabora
					Tunduru
					Ulanga

Source:

"The population of Tanzania" An analysis of the 1967 population Census. Census Volume 6»

The table above (2.6) shows the results of the analysis as regards population carrying capacity in rural Tanzania in 1967. The value for each district in the table is the ratio of the computed population capacity to its actual population. Values greater than 1.0 suggest underpopulation or surplus land, while values tending towards zero suggest population pressure or land shortage if the assumed income level of shs 2500.00, gross per annum per standard household of five members is to be achieved.

Derived from the 1967 analysis of carrying capacities in rural Tanzania, is a fact that Kilimanjaro district was already experiencing land pressure and given the fact that population is increasing within a limited habitable land, this problem is obviously bound to increase unless some positive measures are taken.

In calculating the carrying capacity rates for the districts as shown in table 2.6, the following assumptions were taken into consideration:-

(1) Calculations are based on standardised households comprising five members

(2) Land requirement per household is based on each household producing all its basic foodstuffs, and gross monetary

income of shs. 2,500.00 p.a.

(3) Each district or part of the district where major ecological differences cut across it, is assigned two staple foods contributing equally to the diet

(4) The calorie requirement is assumed to be an average of a 2000 calories per day per member of the household, totalling 3,650,000 per household per annum

(5) Type of calorie needed is disregarded.

(6) Calculation of food crop area assumes that each of the two food crops is grown in pure stand, but that intercropping will give balance of land on which the specific calorie requirements from protein and minerals and vitamins are produced.

(7) Calorific values of the food crops is based on the Tanzania food tables published by the Tanzania Human Nutrition Unit of the Ministry of Health and Social Welfare. Values from these tables were reduced by approximately 10$ to allow for losses in food preparation.

(8) Each district, or part of a district, is assigned a representative set of crops, usually between two and five in nutfber* as "tk® assumed source of income for (2) above,

(9)Each cash crop is allocated a percentage contribution to the total income so as to cultivate the area required for its cultivation.

(10)Each cash crop is assigned an average yield for the whole district, or part of the district, based on farm

management studies and experimental station results and extrapolated, according to mean annual rainfall, where no representative are known.

(11) Each cash crop is assigned an average producers' selling price per kgm, applied over the whole of the United Republic irrespective of regional differences.

(12) A percentage is applied to each district, or part of a district, expressing the maximum area of land which may be expected to carry a crop in any one year.

(13) For districts which are infested with tsetsefly the F.A.O. livestock census figures ^are taken, raised by an arbitary 20i» to allow for expansion, and used in calculating the population which can be supported by livestock reasing

(14) For districts not infested by tsetsefly it is assumed that all uncultivated land, after allowance has been made for waste land and forest reserves, is available for grazing at a stocking rate assigned to it according to mean annual rainfall and vegetation type.

(15) In area of livestock production for milk, a herd requirement of between 25 and 50 livestock units, varying according to the contribution of slaughter stock, is assumed, baaed on a slaughter take-off of 8$ per annum, an average of 28^2^of the herd producing 300 litres of milk per annum sold at shs. 1.00 per litre.

(16) In coastal and take shore districts it is assumed that a part of the population will earn the assigned income level from fishing. This is allowed for computing final carrying capacities.

(17) No allowance is made for those parts of the population deriving income from forestry or tourism

(18) No assumption is made regarding the ability of the household labour force to cultivate the area computed as necessary for it to fulfil the conditions in (2) above, nor regarding the costs of cultivation.

(19) In computing the carrying capacity the total area of each district or part of district, is reduced by an area representing urban and waste land,[3] by the area of forest reserve except where this exceeds 10$ of the total area in which case the reduction is 10$ and game reserve or National Park. The balance of land is assumed to be available for cultivation, but an assigned proportion of this balance only will carry a crop in any one year.

^ Figures from the Statistics Section, Agricultural Division of the Ministry of Agriculture, Food and Cooperatives; Dar-es-Salaam

(2}

' Percentage based on figures given in:
United Nations Development Program. "East African Livestock Survey". Vol. II Development Plans, Food and Agricultural Organization. Rome, 1967

(3) Figures from L. and E. Berry. "Land Use in Tanzania by District". BRALUP, Research Notes NO.6, University of Dar-es-Salaam, April 1969.

Further to what the carrying capacity of the Tanzania districts was in the 1967 census, at the present moment, Moshi districts still has very little unit of land from which one can derive adequate produce to satisfy the income level of shs 2,500.00 per annum per household size of five members. The Unit of land varies from one division to another. So in dividing the total habitable land in each division by the number of households in the division, the per capita land per household in each division in the district comes out in the following manner.

Table 2.7

The per capita land per household in each division in Moshi district:-

Divisions	No.of HOUSEHOLD	HABITABLE LAND ACREAGE (Km^2)	Per Capita Land per Household (Hectares)	TOTAL HABITABLE LAND
Central Hai	12,895	120.5	0.9	11605.5ha,
East Hai	12,843	182.8	1.8	19264.5"
TPC/Arusha Chini	703	599.5	85	59755.0" .
West Vunjo	9,260	335.2	3.6	33336.0"
East Vunjo	12,695	224.2	1.5	19042.5"

Source: Field Survey; 1978

NB: Moshi Town has been excluded.

According to the Kilimanjaro Regional Planning Unit, a household of five members is supposed to have an average of 2.0 hectares of habitable land so as to be able to reach the income level of shs. 2,500.00 per annum. This required unit of land is reached after taking into account mainly the physiographic features and the people's common activities in the region.

Therefore, this being the case, then the Table above (2.7) seems to suggest that West Vunjo division and TPC/ Arusha chini have the average acreage required while the rest of the divisions have less. But, even within a division, there is a variation of the per capita land per household mainly due to differences in physiographic conditions, population density and climatic conditions. And this will be further demonstrated when considering West Vunjo division itself in the latter section.

The case of TPC/Arusha chini hectarage figure can be explained in the sense that, the division is basically a sugar estate and this also explains why there are very few total households compared to the rest of the divisions in the district. Having found out the average per capita land perhousehold in each division in the district it is also important to find out how much population the total habitable land in each division can support. So in finding out the total rural population that can be supported in each division, the following formular will be used.

Population land carrying capacity

$$= \frac{\text{Total habitable land}}{\text{Average Holding Size.}} \times \text{Household Size}$$

The following table shows the population land carrying capacity of each division in Moshi district calculated on the basis of the above formular.

Table 2.8

DIVISIONS	POPULATION In 1975	TOTAL HABITABLE LAND	CARRYING CAPACITY	+ POPULATION.
Central Hai	74,902	11605.5 Hect	64,475	+10,427
East Hai	89,754	19264.5 Hect	64,215	+25,539
TPC/ Arusha Chini	4,818	59755.0 Hect	3,515	+ 1,303
West Vunjo	58,267	33336.0	46,300	+11,967
East Vunjo	88,154	19042.5 Hect	68,475	+19,679

Source: Field Survey; 1978.

+ means excess population

means less population

Moshi Town is not included.

Prom table 2.8, it can be realised that all the divisions in Moshi district are suffering from excess population compared to what their population carrying capacity is supposed to be and the 1975 population. This situation calls for practical measures and policies which will ensure that development in the divisions are in pace with the population increase; and also some solutions of what to do with the excess population. The proposals and recommendations cancerning the problem of land pressure as has been realised above are dealt with in the last two chapters. These proposals and recommendations will focus mainly on West Vunjo division which is the study area for this thesis.

However it is very important to bear in mind that the carrying capacities as shown in table 2.8 are not fixed. They may expand or decrease as a result of natural or man made circumstances and technological advancement. Hence this concept of carrying capacity must be seen as being a dynamic one requiring frequent assessment of available growth and carrying capacity.

Coming down into the specific study area which is West Vunjo division, it has been observed that the population land carrying capacity is smaller compared to the present

existing population. But due to variations in topography climate, soil conditions and peoples main activities, the carrying capacity differs from one ecological zone to another and this is best illustrated in the following table.

Table 2.9

Population land carrying capacity in West Vunjo division in terms of ecological zones.

ZONES	Pop. in 1975	Total Habitable land (hact.)	Carrying	^Population
A	38,002	1071.6	26,765	+11,237
B	9,949	332.4	8,310	+ 1,639
C	10,316	1344.0	12,200	884
TOTAL	58,267	2748.0	46,275	+11,992

Source: Field Survey, 1978

A = Coffee--banana zone

B = Maize zone

C = Mixed farming zone

Prom the above table, it becomes clear that although the division is as a whole over-populated, there are zones which are under populated hence facing no problem of land pressure. Thus, the figures in the above table indicate

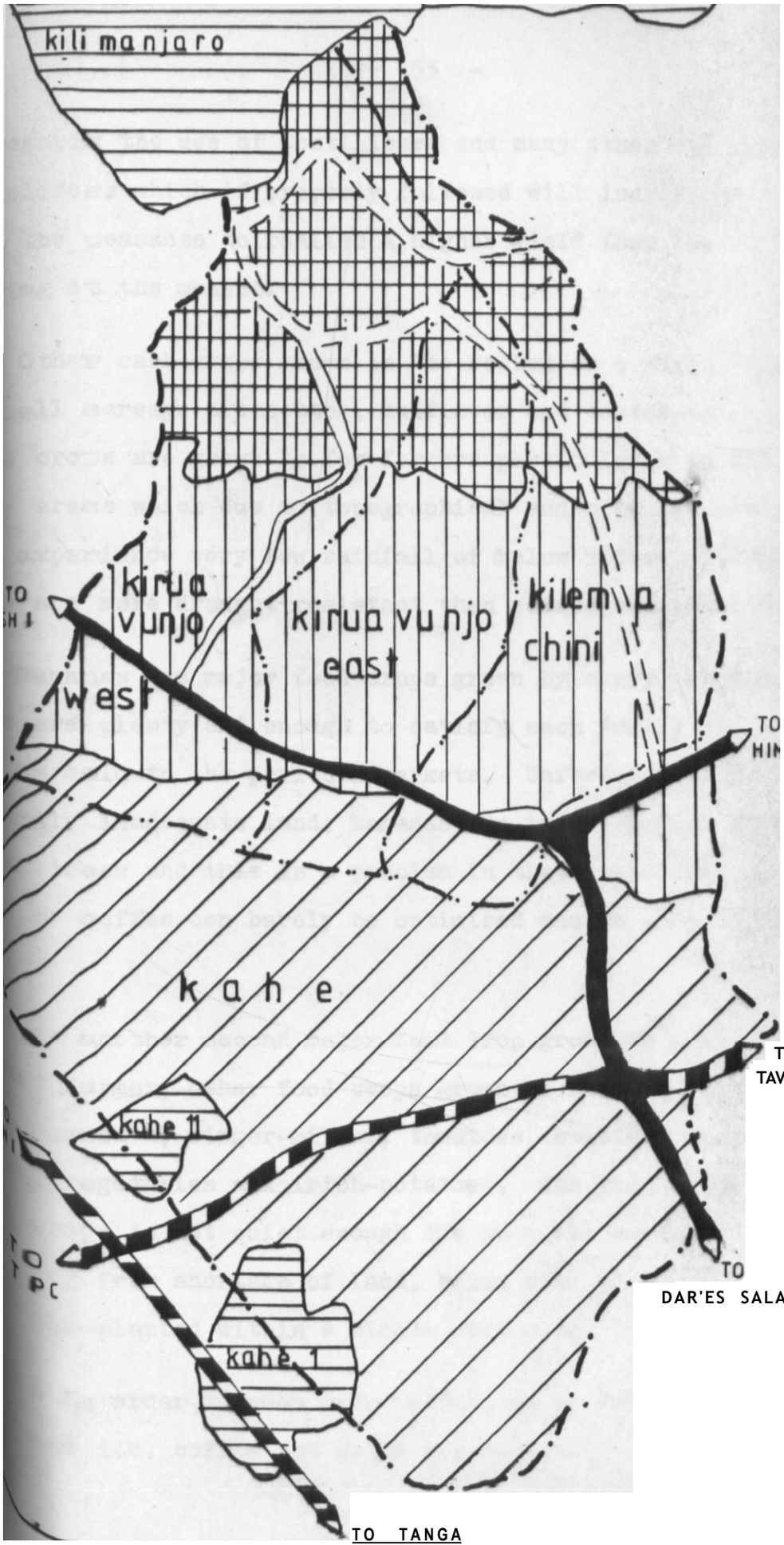
that even if some of the population in zones A and B is resettled in zone C, there will still be a problem of resettling the remaining 11,992 population in the same division. Hence such a situation calls for various measures and strategies to be deployed so as to alleviate the lives and the living standards of the excess population. The strategies are to differ from one zone to another depending on the topographical, climatic conditions together with the people's main activities. As it will be discussed further in the final chapter of proposals and recommendations, the proposals shall in brief include resettlement of some of the excess population in zone C and in other parts of the region and outside the region which are potential for agricultural development and other related activities, but are underpopulated. They will also include introduction of non-agricultural activities such as small scale industries, modern bee-keeping in the unhabitable areas especially the hilly ones, modern farming techniques, introduction of new cash crops such as cotton, in zone C and part of zone B, afforestation,re-organization of the settlement patterns and so on.

• Crop Production:

Kilimanjaro region is one of the few regions in Tanzania which are naturally very potential for agricultural farming. Most of the inhabitants in the region are small-holding peasant farmers. 94$ of the households in the region are small holding households and the members of this households represent 91$ of the region of 865,000 people (E.A. Tarimo, District Agricultural Development officer, Moshi). Hence about 90 of the whole regions population is employed on land in the rural areas with fanning as their major accupation.. Only a small percentage is engaged in other non-agricultural activities such as in commerce, small scale industries and in government and private sectors.

Farming in the region has been there since the coming of the first Europeans in the 19th Century and the introduction of coffee in the region.

Coffee is the major cash-crop and source of income grown by almost every peasant farmer and this is grown, mainly between altitudes 4,000'-6,000' owing to the conducive climatic conditions favouring this zone. On the whole, Moshi district has a total of 21,473 hactres of coffee trees; but as it will be seen later on, the total yield has been fluctuating due to various factors such as the outbreak of Coffee Berry Disease (CBD) in 1972, lack of adequate agricultural extension officers to advice the peasants on modern farming and proper farm management especially



EXISTING LAND USF

LEGEND:

^ divisional boundary

f ^ ward boundary

trunk road

=] all weather ROAD

dry weather ROAD

railway

fores t s

C 0 FFEE, BANANA/ BEANS, YAMS, S WEE T-PO TATOES FRUITS, CATTLEUtall feeing]

r r n MAIZE, FINGER-MILLET, LLH SUNFLOWER, CASTOR M ILLE T, LI T T LE 6RAZIN6

pTJGRAZ IN GY MAIZE, COTTON, ^SUNFLOWER, GROND NUTS, millet-

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as regards the use of fertilisers and many other related guideliness which if properly followed will inevitably help the peasants to realise a higher yield than what is getting at the moment.

Other cash-crops grown in the region as a whole albeit in small acreage are cotton, sunflower and castor oil. These crops are grown by few farmers particularly in the lower areas which due to topographical and climatic conditions, they experience very low rainfall of below 500mm p.a. such crops are more draught resistant than coffee and bananas.

Bananas are major food crops grown by every peasant. These are plenty and enough to satisfy each family and some is sold to the periodic markets. Unfortunately due to partly inadequate land, bananas are inter-cropped with coffee trees and this is a problem in that yields especially those of coffee can barely be optimised due to competition of food.

Maize is another second major food crop grown by nearly every peasant farmer, other food crops grown in the area include beans, cassava, finger-millet, tomatoes, sweet-potatoes, fruits, vegetables and irish-potatoes. The production of these crops is not quiet enough due to small acreage resulting from shortage of land, hence most of these crops are inter-planted within a single farm plot.

So in order to show crop production in the district two crops i.e. coffee and maize are purposely chosen.

Table 2.10:-

Maize Production in Moshi district-

Year	Acreage ploughed	Yield per acre (bags)[1]	Total tourage
1972/73	17,329	6	10,310
1973/74	15,090	9	13,500
1974/75	35,900	11	37,800
1975/76	35,500	9	36,200
1976/77	35,710	10	36,800

Source:

Pile No. Ag/R/O/34, "Annual Reports-Moshi district".

The above table reflects a general increase in yield per acre, but this trend is still far below what is expected from a well managed farm. According to the District Agricultural Officer of Moshi, one acre of maize is expected to yield between 15-20 bags on average. This average figure can be realised by following the modern farming techniques and strict adherence to the instructions offered by the field Agricultural extension officers.

But given the present situation in the region, it is difficult for such an average figure to be realised by

the peasants, in that most of their farm acreage is very small. For instance according to the analysis of the field data collected as regards, Vonjo West division, 68$ of the peasants interviewed harvest an average of 3-7 bags of maize annually and also 52$ of the peasants interviewed have their farm size of between 0.1-0,5 hactres.

Therefore from the data analysis, it becomes certain that apart from other factors such as inadequate field agricultural extension officers, problem of inter-cropping, ignorance or unwillingness of the peasants to change from the traditional farming techniques to modern ones and so on, which affect the total yield per given unit of land; the question of farm size per peasant farmer is very vital in being able to reap more. So the land pressure factor plays a very substantial role in determining crop yield per unit of land.

For instance, considering Tanzanian nation as a whole, in 1967 there were about 100 people who depended on about 250 acres as usable land. But by 1990 it is estimated that

about 200 people will depend on the same size of land.

That means while in 1967 there were 2.5 acres per head under cultivation, there will be 1.25 acres per head under cultivation in 1990. (C.K. Omari; P 102). The above observation made by Omari is very significant in that it reflects the magnitude of land pressure in the nation as a whole with its present growth rate of 2.7% p.a. And if this is the general picture of the overall nation, then what will be the situation in the most affected regions such as Kilimanjaro? Obviously sound and realistic strategies and policies must be worked out to arrest the situation before it worsens.

Another problem the farmers are facing in trying to improve even their meagre farm plot concerns income earnings. The income earning of the majority of the peasant farmers is too low that it becomes a burden for them to afford the purchasing of fertilisers and hiring of tractors or ploughs to improve their farms and hence fetch more yield.

Por instance in Vunjo West division, the data analysis concerning average annual incomes of the peasants interviewed

shows that 40% of them get between Tshs.1501,00-3,000.00 p.a. This amount is very little to feed adequately a family of five members and be able to save some for other development programmes like improving his farm and purchasing fertilisers.

From the above observations, it is very fair and rational to conclude that together with other factors necessary for a farmer to be able to fetch an optimum yield from his farm plot such as use of fertilisers, proper timing, good selection of seeds, adoption of modern farming techniques and adherence to the instructions offered by the agricultural extension, officers, the question of farm size is very important. And in the case of Vunjo West division and the region as a whole farm sizes are very small and this is a direct result of population land pressure in the region.

Coffee:

As it has been noted in the previous Sections, Coffee is the main cash-crop in the region and the major source of income to the peasant farmers. Hence given its uniqueness as the only dorminant cash crop, it means that every peasant farmer has the obligation of trying to ensure that he gets as higher yield as possible from his farm plot.

But, the situation in the region is not so easy due to factors some of which have been discussed as regards maize production. Although by looking at total annual figures, the production of coffee seem to increase (table 2.11) this overall increase is not so much, significant to an individual farmer.

The mere fact that the farm sizes are very small and still inter-cropping is the normal farming practise, the expected yield per unit of land is hard to realise. For instance in Vunjo West division, the field data analysis shows that 68$ of the people have less than 0.5 hactres of land and their annual harvest is 3-7 bags of factory coffee. This means that in order to realise more output, either the farm sizes should be expanded - something which is impossible because of population pressure as has been previously illustrated, or more intensification use of the existing plots with modern farming techniques and use of the appropriate agricultural instructions. But this again is a problem because the farm sizes are too small for someone to hire a tractor, and secondly the peoples' affordability of purchasing fertilisers is questionable since as it has been observed from the analysis of the field data that 76$ of the peasants have their annual average income of less than Tshs.2,000/-.

There are other factors which have also affected the production of coffee in the region. The outbreak of CBD (i.e. Coffee Berry Disease) in Tanzania has done a lot of demage as regards coffee production.CBD has been in Kenya since 1922 and it was firstly cited in Tanzania in Tarime district, Mara region in 1954. In 1966 CBD was cited in Nronga-Machame in Kilimanjaro region and by 1967 it had spread nearly in all parts of Kilimanjaro region. This disease is very destructive as it attacks the coffee flowers and the young coffee berries and once it has done so, the only solution is to uproot and burn the whole affected coffee trees. Its impact on coffee production can be seen in that in 1972/73, out of the total coffee acreage of 21,473 in Moshi district, 6,172 hactres were destroyed and in 1973/74; 9,523 hactres were also destroyed by CBD.

This had a very serious drawback to the peasants who do not have any other major alternative cash crop. Again given the inadequacy of field agricultural extension officers (there is only one officer in each division), most of the peasants were left without scientific knowledge of how to combat it and this affected their incomes and living standards adversely.

In order therefore to be able to see the trend of total coffee production in Vunjo West division over the past ten years, one Cooperative Society among the four ones in the division is here deliberately chosen for illustrative purposes, (Table below).

Table 2.11

Sources Pile; Kirua Vunjo West, "Collections of Coffee Advances Prom 1968/69 - 1977/78

YEARS	PARCHED COPPEE GRADE I KGMS	PARCHED COPPEE GRADE II KGM	COPPEE CHERRIES GRADE I KGM	COPPEE CHERRIES GRADE II KGM	FACTORY COFFEE GRADE I KGM	TOTAL KGM
1968/69	154,888	-	298	478	159,442	315,016
1969/70	110,604	1015	1238	159	24,967	137,978
1970/71	24,748		789	-	97,511	123,048
1971/72	338,113	-	619	-	121,067	464,323
1972/73	281,278	-	1928	-	41,409	324,615
1973/74	285,044	-	2727	-	64,744	352,515
1974/75	285,021	-	2865	-	64,744	352,630
1975/76	347,366	122	4725	-	52,475	404,688
1976/77	134,312	114	2807	a	15,550	152,783
\ 1977/78	\ 290,582		2129	—	27,211	*319,922*

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By looking at table 2.11 above, it can be said that over the past ten years there has not been a very significant Increase of coffee output in this part of the Vunjo West division. If this is the case then two suggestions can be cited as being the most convincing and explanatory.

The first suggestion is that in this particular area there is not more vacant land for further expansion. Consequently yield from a given fixed plot of land is not likely to increase if the same traditional methods of farming techniques are applied.

The second suggestion which follows directly from the first one is that because farm sizes can not be expanded anymore, and because the average annual income is very small, adoption of modern farming techniques and advices from agricultural officers by peasant farmers so as to be able to realise even much more yield from the same small farm size has not been fully appreciated by the peasant farmers. These suggestions therefore explain the reasons as to why over the past ten years, there has not been a very significant improvement in terms of total output. This is very clear because if one wants to increase his output per unit area, he has to do either of the following two things or both.

Firstly to expand the existing acreage of farm plot. Secondly to intensify the use of the existing plot by applying

modern fanning techniques and the suitable technology - e.g. application of fertilisers, proper management from the beginning of farm preparation up to the time the produce reaches the final consumer.

The other way by which one can increase his total output can be the combination of the above two alternatives.

Hence judging from the above table it would appear that none of the three alternatives has been successfully applied. This kind of situation therefore calls for appropriate and practicable strategies which if properly implemented and managed will to some extent improve the situation. The possible strategies and recommendations are discussed in the final two chapter.

Land and Development

The word development is very widely talked of by many people of various disciplines but the word itself is sometimes confusing. In fact there is no a universally accepted meaning of the word development. As a result the confusion comes in due to the various interpretations which have been attached to the term as well as the misconception of what it means and what is involved in it. Depending on what particular aspect one is looking at and on what particular field of discipline is concerned about - i.e whether is economics, sociology, planning and so on, the term is always bound to be interpreted according to the specific aspect and discipline in question.

However, development in this case should be seen as being by and large concerned with the welfare of the people. As it has been noted in the previous chapter, the underlying basis for rural development should entail both the quantitative and qualitative changes among a given rural population, and these Structural changes must be able to demonstrate a rise in the standards of living of the population in question. Therefore development should here be taken as applying to every segment of a given society and furthermore all developmental programs should aim at benefiting the citizenry.

In view of the above understanding of the term development and rural development, then it is very important to consider some of the essential factors underlying rural development as a whole but with specific altention to Vunjo West division. Most of these factors shall be briefly discussed to give a general picture. This is so deliberately done because the major concern of this thesis is land pressure as the main constraint in rural development. Hence the other factors, albeit important are in this case secondary®

As far as the Tanzania government policy is concerned regarding development, people, land, good leadership and appropriate policy are viewed as being the most important factors which if properly planned will alleviate and improve the lives and living conditions of the majority of the people. It is considered that a well fed, healthy

and energetic people are capable of contributing into the national development programmes and activities more than the underfed weaker and poor ones. Land is taken to be the most important factor since the nation's economy is primarily agricultural and 9C# of the entire national population is employed on land - i.e agricultural farming. This being the situation, the issue of land ownership, land policy and land management are all vital as far as land as a factor of development is concerned.

Good leadership is also an important factor because unless the people can participate fully in the development programmes and projects and unless the type of leadership necessary for the success of such programmes is fully appriciated and backed up by the people, no matter how good and well planned programmes are, they will either be left unimplemented or even if implemented their chances of succeeding will be very narrow.

For any type of development to be successfully achieved, it must be guided by an appropriate policy. And such policy will definitely depend on what one means . and regards as development. In the case of Tanzania, since development generally means the improvement of the lives and living standards of the entire people, the appropriate policy has been found to be the one discouraging all sorts of exploitation. Consequently all major means of production

including land, natural resources, banks, industries and Services and so on have been put under public ownership. This exercise has been very fundamental as it has reduced the outflow of the nation's wealth in the form of interests and profits to other countries particularly the developed onei It has also made it possible for every citizen to have equal share and say in the national development programmes and distribution of the country's wealth.

Although the above four factors are important in as far as policy formulation regarding development is concerned, from the physical development planning point of view such factors are not by themselves adequate. Physical development Planning ought also to take into account the physical, economic, social, political, cultural, Administrative and infra-structural factors existing in the area or region on which the plan is directed.

The physical factors affecting the development of an area include the topography of the area, its location, its resource potentiality, soils and climatic conditions.

The economic factors are mostly related to the peoples incomes and employment.If the people are generally economically poor and their incomes are very low, it will be hard for them to improve their life standards by improving or modernising their farms, construction of basic required

facilities such as dispensaries, hospitals, schools, roads, good houses and piped water. So the economic position of the people and potentiality of the area of which the planning is directed is also an essential factor determining development.

Peoples or regions' social backgrounds differ a lot. Thus knowledge about the social background of an area or the people will provide a sound basis upon which practical and realistic policies and stategies to foster development in the area can be worked out.

The political consiousness of the people and the governments' political attitudes towards the region or people under the development project programme is also a strong factor which can either slow down or speed up development in a given area. Also the peoples or regions cultural background and extent of being developmentally oriented or conscious attributes a lot in so far as development is concerned.

Accessibility and connectivity of an area to other parts of the country is also a very significant factor determining development. If an area or region is well accessible and connected with other regions, there will be an easy inflow and outflow of new ideas, information, technology, communication and transportation of the goods to the appropriate market centres. Furthermore good transportation network and communication system facilitates the exploitation of the untapped natural resources in an

area and in so doing other facilities and services as well as employment follow suit which gradually raise the life standards of the people.

Nevertheless, even if all the mentioned factors were not a problem in an area, there is however the task of implementing the development projects. Hence the administrative factors are also of great importance in any given development programme.

In as far as Vunjo West division is concerned, all the above mentioned factors share some responsibility in the slowing down of development, but the most outstanding one is the shortage of usable land. Give the fact that the division has the capacity of only 46,300 people contrary to the present population of 58,267 people as it was in 1975, it means that virtually there is not any vacant land for any public use and introduction of any facility or service will necessarily require acquisition of some peoples plot of land. In order to relieve the division with the land pressure problem and help improving and raising the living standards of the people, alternative means of development must thus be worked out. In drawing up the alternative strategies, the question of land availbility and its agricultural potential must be taken as a true guiding factor. Having briefly looked at some of the essential factors attributing to rural development in the division, let me now examine the existing infrastructural facilities before looking at planning process in Tanzania and a few selected development

projects and problems encountered in choosing an appropriate site due to scarcity of vacant space.

2.2.1 Infrastructure! facillties:-

The term infrastructure is very wide incorperating a lot of things. Due to its wide coverage, it will in this context be used to incorperate only the basic infrastructural facilities vital for all mankind. These basic facilities are mainly considered to be roads, health facilities schools, water and housing.

In as far as availability of infrastructural facilities is concerned in Vunjo West division, it is fair to conclude that the existing ones are on average satisfactory and what is mostly required is their improvement and upgrading. Taking housing for instance, one finds that it is no longer a problem not only in Vunjo West division, but in all of the Kilimanjaro region. At the moment 85% of the housing units are of corrugated iron sheets, and out of this about 20% of the structures are made of concrete blocks with cemented floors. So housing in the region is not at all a major problem and even the "better housing compaign" going on in the country has got very little to do with the residents of Kilimanjaro region-.

As to the other infrastructural facilities such as roads, schools and health facilities, the main concern is that of an improvement and upgrading rather than provision. In the entire division composing of thirty

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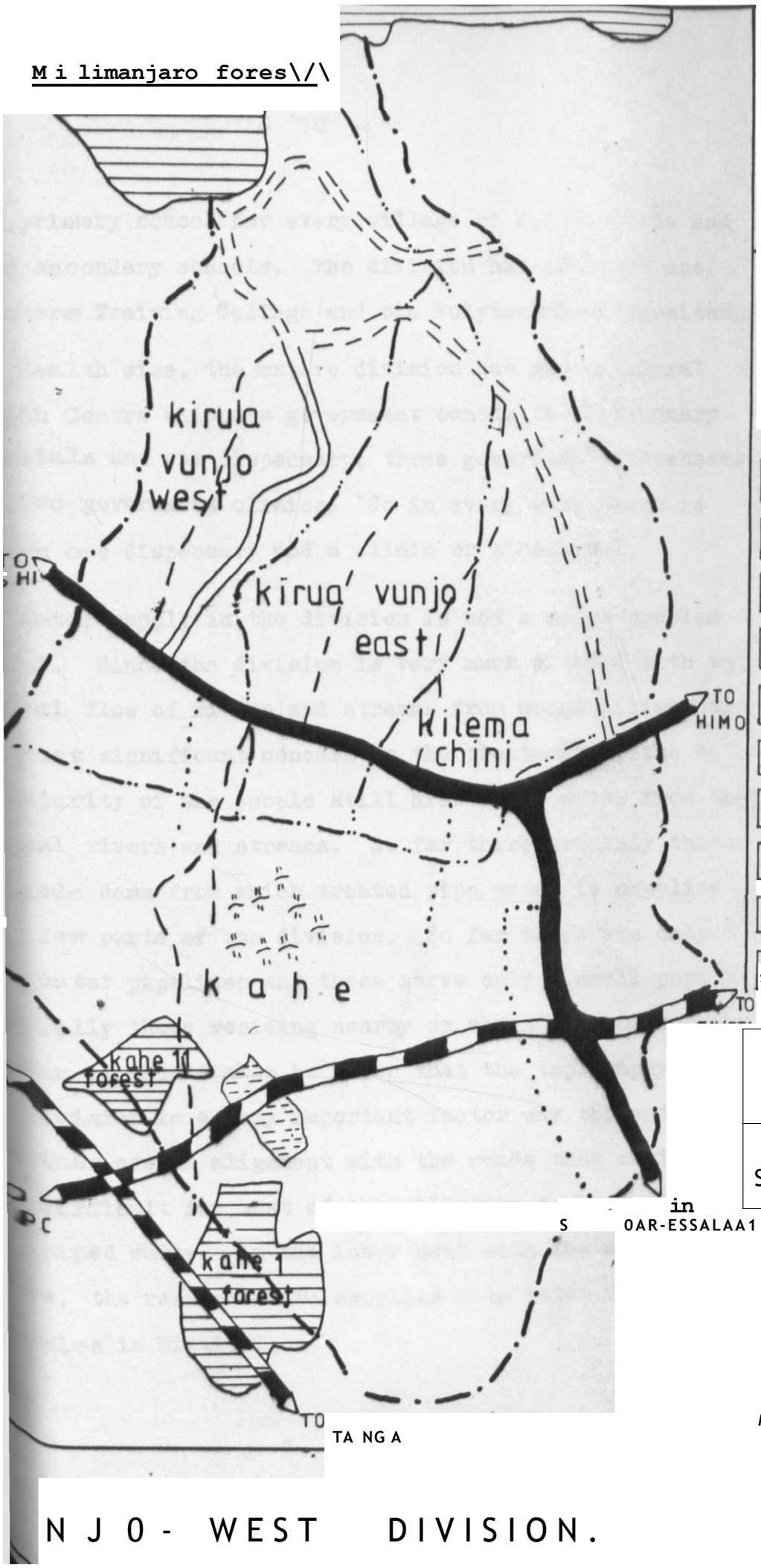

EXISTING TRANSPORTATION NETWORK

LEQENP

- DIVISIONAL BOUNDARY
- 1 WARD BOUNDARY
- TRUNK ROAD
- ALL WEATHER ROAO
- DRY WEATHER ROAD
- RAILWAY
- MAIN TRACKS(motorabl«)
- OTHER TRACKS AND- FOOT PATHS
- ** LMARSHY AREA
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JAMES, V. M.

URBAN AND RE G I ONAL PLANNING DEPARTMENT

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MA PLANNING. 1978/71

TA NG A

N J 0 - WEST DIVISION.

MAP NO 12

one primary school for every village of 5,500 people and four secondary schools. The division hag got also one Teachers Training College and one Polyteohnical Institution.

Health wise, the entire division has got one Rural Health Centre which is government owned, two Missionary hospitals and one dispensary; three government dispensaries and two government clinics. So in every ward there is either one dispensary and a clinic or a hospital.

Water supply in the division is not a major problem at all. Since the division is very much endowed with the natural flow of rivers and streams from mount Kilimanjaro, the most significant concern is the treatment of the water as majority of the people still draw their water from these natural rivers and streams. So far there are only three man-made dams from which treated pipe water is supplied to only few parts of the division. So far there are only four water pipelines and these serve only a small population especially those residing nearby or along the roads. However it should also be known that the topography of the division is a very important factor why the water pipelines are in alignment with the roads thus making it very difficult for most of the villagers to be supplied with piped water. In the lower zone with few streams and rivers, the residents are supplied with water from three boreholes in Miwaleni.

Arising from the above discussion, it is possible to conclude that presently the existing infrastructural facilities are averagely satisfactory; this is however true if the population growth is assumed to be static. But given the 2.7$ rate of population growth per year, there is obviously a serious need for provision of more facilities and improvement of the existing ones. This need and peoples desire can be well illustrated by looking at the peoples response to the question of what they thought the division ought to do so as to improve their living conditions. The overwhelming top-priority choices were to construct and improve all weather roads, hospitals and treated water supply and this accounted for 60$ of all the respondents interviewed. The second priority which accounted for 24$ was the introduction of small-scale industries, schools and library services the third priority - i.e. 16$ was provision of telephone services, cooperative shops and more bus services. Prom this priority ranking list, housing has not been considered to be a problem and this further shows that housing condition in the area and the region is much far better compared to other parts of the country.

With all such demands their provision definitely requires space and proper location to be able to serve most of the people, but it is this same issue of the availability of space which this study is all concerned. Much as it has

"been discussed and illustrated in the previous sections, apart from other factors which are similarly important for rural development, the shortage of usable land in the division is in this study considered to be the major constraint inhibility rapid rural development in Vunjo West division. Nevertheless, the administrative changes of 1970»s which followed the introduction of decentralisation policy in 1972 have had a very encouraging effect so far as planning and implementation of development projects is concerned. In order to appreciate fully the importance of the decentralisation policy, the following section sets out to briefly examine the planning process in Tanzania before and after decentralization and its effectiveness in project implementation.

2.2.2 Planning process in Tanzania:-

Planning process in Tanzania assumed a new dimension in 1972 with the introduction of decentralization policy. Before 1972, planning was mainly vested on the whims of the central government. All plans and development programmes were directed from above. These programmes were very general covering a region or district and could not indicate the specific areas on which a certain project was to be initiated. And moreover,such imposed projects from the above were in most cases not what the masses viewed as their immediate requirement or priority. This tendency therefore led into plans and projects not being implemented or if implemented they rarely got completed because of lack of participation

by the masses.

It was from this background realisation of the significant role the masses have in development projects in terms of their full participation that the decentralisation policy was introduced in 1972.

This is vividly illustrated by President Nyerere in his paper on decentralisation which he tabled to the then TANU National Executive Committee (presently known as CCM Executive Committee) meeting in Iringa in May 1972. He started off by saying that, "The purpose of both the Arusha declaration and Mwongozo was to give the people power over their own lives and their own development. We have made great progress in seizing power from the hands of capitalists and traditionalists, but we must face the fact that, to the mass of people, power is still something wielded by others, even if on their behalf".

Prom the above quotation, it seems to suggest that the decentralisation policy is more concerned with giving power to the people. In fact decentralisation can mean several things. It can mean decentralisation of government procedures and responsibilities to government officials at both regional and local levels. On the other hand, it can also mean transfer of power and authority to regional and local representative institutions.

Hence in talking of regional or rural development planning in terms of peoples[1] participation in the decision-making process, it is important that viable representative institutions are created at both regional down to village levels to which power and authority could be devolved.

Judging from what has been happening since 1972 up to 1975, the fact is that power for actual decision making had not been decentralised except only the administrative procedures. But since decentralisation seeks to give more power to the people, it must therefore concern itself with the creation of authorities ofa political, administrative and legal character to which political authority and power are transfered from the centre to enable those authorities to make public policy for a particular sub-division into as far as its local development priorities are concerned. It is thus envisaged that development planning should start at the grass roots through the village and ward development committees. This will in fact enable the masses to identify their own problems and priorities. Furthermore in implementing the proposed projects, problems such as site selection and space availability will not be very difficult to resolve as the masses themselves could decide to acquire a certain plot and compensate the owner as long as the project is for the benefit of the entire community and it has been proposed by themselves.

Another advantage which has so far been found out in involving the masses in the planning and project identification

process is that, some individuals voluntarily surrender part of their plots for a project like nursery school or dispensary, and in fact this could not have been the case if such projects were directed from above without the full knowledge and appreciation of the mass of the people in the area concerned.

It was after the realisation of the usefulness of mass participation in speeding up development in the rural areas that in 1975 various development committees from the village level upwards were initiated. These committees include village Political Committee; Village Development Planning committee; Village Production and Marketing Committee; Village Social Welfare and Security Committee and finally village Education and Culture Committee; All these Committees are chaired by Village managers who are by and large form four graduates on various fields of study; and some villages have also University graduates as Managers. Hence it is the collaboration and Cooperation of these various Committees charged with drawing up development projects in a village and rank them in terms of their priority with the full consideration of the people's views which are aired through their ten cell leaders who are automatically members of one of the committees mentioned.

Having briefly discussed the planning organizational process as it exists at the present time, let me now examine some specific development projects underway in the division and relate them with the main problem of shortage of usable land and then find out how the people themselves have "tried to cope up with the situation.

Some earmarked development projects:

For the purpose of clarification, only six projects are considered. These are: Construction of a dispensary at Yam; a primary school at Kwamare; Rural Health centre at Pakula; Brick making at Kwamare; Community Centre at Iwa; and a Secondary School at Mbuyuni (map 3).

Out of all these projects only the RHC and the Community Centre have been completed. Some of the rest are underway while others such as the proposed secondary school, brick-making, dispensary have not got off the ground. In implementing these projects the main problem was the availability of vacant space. In resolving this some people plots and parts of their farms were acquired and in other instances football playing grounds were acquired. For instance as regards the construction of the Rural Health Centre, the Pakula primary school playing ground was acquired together with quarter an acre of an individuals farm who voluntarily surrender it for the benefit of the community.

For the Community Centre, the Iwa Parish volunteered to give its part of land and the samething with the secondary school in which 2,4 hactres of land belonging to the same Parish were voluntarily offered. As regards the dispensary, an individual farmer willingly surrendered his 0,4 acre of his farm. For the other projects individuals' plots or part of it were acquired and were expected to be compensated either by being given money or being given another plot of land in

DISTRIBUTION OF SERVICES.

LEGEND-

[?£] PRIMAL SCHOOLS

[sTjsECONDARY SCHOOLS

[HC]TEACHERS TR. COLLEGE

E3POLLY TECHNICAL SCHOOL

ET1 CHURCH

[cH jcOHHUNI TY HALL

[RHC]RURAL HEALTH CENTRE

[H^|HOSPITAL

[QSGIOISPENSARY

IHKT IHARKE T

I • |EAfaMARKED PROJECTS

[•^MARKET CENTRES

^DIVISIONAL HEADQUARTEJ

^HojcOUR T HOUSE

1BH IBQRE HO L E S

B WATER PIPE LINE S

EZ230 A MS

1 jWAR 0 BOUNDARY

TRUNK ROAD

[^EJP AILWAY

4

SCALE. 1:1 OQOOO-

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URBAN AND REGIONAL PLANNING DEPAR TMEN T

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the less populated areas of the lower zone and outside the division.

The selected few development projects clearly demonstrate the extent at which rural development in the division can be slackening due to the lack of immediate vacant space in which the project is to be carried on. Consequently the time taken in looking for a suitable place for the location of the project, and the time taken to complete the compensations is so great that most of the projects are slowly implemented and in some cases very difficult to implement no matter how good and useful they are to the community.

Prom this analytical chapter, it has been found out that inavailability of enough habitable land is the major constraint in fostering rapid rural development in Vunjo West division. This does not however imply that the other factors necessary for rural development are not themselves a problem; they are equally important only that their solutions are much more easier than that of land pressure.

However, the general response of the masses towards these problems when it comes into implementing the proposed projects, particularly the problem of site selection and space availability in an area so densely settled has clearly demonstrated that whenever there is mass participation in planning and identifying development projects most needed,then most of the problems arising in the implementation process can largely be minimised.

In conclusion therefore, this analytical chapter has pointed out most of the problems and actual factors inhibiting rapid rural development in the study area. These constraints differ from one geographical location to another, as in most cases such variations are determined by the physical, economic, social and political conditions of the area together with its resource endownment. Therefore any meaningful models, proposals and strategies concerning the development and improvement of an area must first of all find out the major specific problems pertaining in the area.

Furthermore knowledge about the people's social, political, economic and cultural conditions is of great importance if the proposals and recommendations are to be of any use to them and be successfully implemented with full participation of the people themselves.

It is from this baeio understanding that the study of Vunjo West division has been able to reveal various constraints slowing down development in the area.

In summary these constraints have been found to be firstly the inavailability of adequate usable land by the majority of the inhabitants. This is the most significant constraint holding back the rapid transformation of the rural economy from the traditional land use techniques to the more productive modern one.

The traditional customary practise of dividing the original plots one has among children as they marry and establish their own families is another development constraint. This is so because todate, most of the plots are so small that it is even difficult to give land for farming to a son who wants to be a farmer, and furthermore, it is also difficult for two or more families to live on the income from one shamba. For instance, from the analysis of the division, a household of five members has on average a plot size of only 0.2 hactres to depend on for his livelihood, with average annual income of between Tshs. 1,500-2,000. The analysis has also shown that the population carrying capacity of the division is only 46,300 people contrary to the present population of 58,267 people. This kind of situation clearly demonstrates that inadequate habitable land in the division is a major problem confronting the people in their attempts to improve their living standards.

Interplanting of both cash and food crops on one farm is also partly a function of land shortage, although as in the case of most African farming practice, interplanting is due to many other factors such as saving of farm labour per plot, the kind of technology used and the type of crops commonly grown which render themselves possible for inter-planting.

The great emphasis laid on agricultural activities by the majority of the people neglecting the non-agricultural ones which are potential but only needs exploitation and proper management has also had an impact on the development of the division. Introduction of non-agricultural activities together with small scale industries such as tailoring, carpentry, fruit canning could act as another source of income to the landless young people.

Inadequate infrastructural facilities is also a significant factor hindering development in the area. This factor is closely related to the major problem of land pressure since provision of any facility such as hospital, schools, roads, health centres would inevitably require acquisition of individuals plots or part of their plots since there is no any vacant land left for any public use or development.

The division being predominantly agricultural it lacks enough agricultural field extension officers to advice the farms on the good farming methods and techniques. Presently the field agricultural officers are available up to the divisional level only, and even on this level there is only one officer to take care of the entire division.

The physiographic conditions of the area do also affect development. Most of the area is comprised of very steep slopes and deep valleys. This limits the amount of usable land which can be utilised for development purposes.

The climatic and soil variations in the division do also have impact in terms of development.

Hence, as a matter of fact, it can be seen from this study that so far as rural development is concerned there are several factors attributing to it, but in this particular case, the factor of land pressure is the most overriding one. So in trying to propose solutions and strategies of resolving the problem of rural development and that of land pressure, specific factors should be given specific attention as to their place of occurrence. This type of zonal consideration will make it possible to come up with different models, proposals and strategies to be implemented on various zones in the division.

14 is from this basic consideration that the next chapter shall be concerned in finding out spatial models for alternative pattern of development that can optimise development vis-a-vis constraints, alternative farming practice that optimise land shortage, climate, type of crops, farming income and population distribution in the division; and finally a spatial model for the development of public utilities based on the other models of spatial pattern of development, population distribution and unit population for the services.

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CHAPTER 3

Synthesis of the Analysis:

Introduction:

The second chapter detailed out the existing situation in the study area - i.e. Vunjo West division. However it was noted that the area and the region as a whole began experiencing land pressure during the 20th Century. In Kilimanjaro region, the system of land tenure has for a long time been on individualistic basis and as such individualistic values on land are very common. Because of this, the idea of cooperation and mutual values has always been in conflict with the prevailing individualistic competition. To a certain extent the introduction of coffee as a major cash crop and programmes for their improvement have reinforced the competitive rather than the cooperative side of the conflict. This chapter is therefore going to lay down models and strategies to resolve the identified problems in chapter two.

As noted in chapter two, the main problems identified so far as rural development in Vunjo West division is concerned were inadequate usable land, which led to landless people who are either unemployed or underemployed. Also the problem of the still existing traditional land tenure and agricultural practices which -has significantly contributed to the problems of lane

pressure and land fragmentation. Monocultural cash economy, low standards of both physical and infrastructural developments; lack of effective and adequate extension services lack of effective family planning together with the general topography of the division are also some of the problems inhibiting rapid rural development in the division.

To resolve these problems, the first thing to do is to introduce rural transformation programme in the area which will incorporate an agricultural development strategy through land use reform programme. This programme simply implies the reorganization of the settlement patterns in the division. Unless such a programme is introduced the policy of rural development which simply envisages an increase in the output of goods and services, expansion of total employment, improvement in productivity, wider application of improved technology, steady growth in consumption and the enlargement of educational, medical and social amenities and facilities will not be very effective in the division.

The goals and objectives of such a programme are firstly reduction of population pressure already being experienced on the agricultural land. This will allow creation of economical farm holdings, which in turn allows the application of more scientific methods of farming leading to higher productivity of the agricultural land. Another goal is the creation of employment opportunities to relieve pressure by absorbing the extra agricultural

population. The third goal is to change the trational land tenure system to allow the implementation of land use reform programme1 which aims at re-organisation of the settlement patterns. The fourth goal is to diversity the agricultural crop so as to reduce the dependency on mainly coffee and bananas as the main cash and foodcrops respectively. Such a diversification will allow more intensive use of land, more working opportunities and increase in production. The fifth goal is to provide adequate infrastructural services and facilities and finally to make agricultural extension services more effective so as to enable an accelerated agricultural development to take place in the division. Therefore for such goals and objectives to be achieved, rural transformation programme is of great necessity,

3.2 Land Use Reform Programme:

Incorporated in the Rural transformation programme is an agricultural development strategy which calls for land use reforms. There is therefore a need of consolidating the household holdings to form cooperative farms or estates. Conditions calling for such a need are the continued fragmentation of the holdings and high population densities which all contribute to poor farming management and practices.

As it has been noted in the previous chapters, individual ownership of land dates back as far as 1890's with the introduction of coffee as the main cash crop in

the region, and people viewed very highly the possibilities of advancing in the agricultural sector. But the move to achieve such advancements has largely been slowed down by the traditional customary laws of land tenure, transfer of land and the inheritance practises. Since sound agricultural development is seen to be dependent upon a system of land tenure which makes available to the farmer a unit of land and a system of fanning whose production would support a family at a level comparable to other occupations, then land use reforms through consolidating the household holdings would help speeding up economic development of the division as it may be witnessed in the Central Province and Kisii of Kenya.

The consolidation of household holdings has many advantages. Firstly time and money spent on travelling between the scattered plots of land by extension aides would be saved, and also there would be an increased security of land tenure which would in turn facilitate security of agricultural loans and enable farmers to make long term improvement of their farms. Another advantage is that such consolidation would act as a stimulas to agricultural development which in turn would encourage higher levels of employment in the rural areas thereby reducing over-population on the agricultural land. Hence the whole of this exercise would create an environment conducive to the required

development in both the agricultural sector and the entire rural spectrum.

But this land consolidation programme is not without constraints or limitations. In the first instance such a programme should be accompanied by other vital factors like improved infrastructure in the area, good credit facilities, organised marketing system, substantial amount of extension and advisory work in order to bring out the desired benefits. Also the need for adequate control and follow up to ensure that the land is being utilised productively or else re-subdivision of the holdings might again creep back.

Re-organization of the settlement patterns:

As it has been noted earlier on, the scattered pattern of settlement that exists in Vunjo West division and the entire country limits development, utilization and consumption of most of the services provided by government. This situation need therefore to be discouraged. Therefore in order to minimise the above mentioned problems, the settlement patterns must be re-organized.

So if the land consolidation exercise is successfully implemented, then the individual holdings will be arranged as in figure 3.0(b). Although such a pattern of development

TTLEME NT pattern(SKETCH) BEFORE re-ORGANISATION-

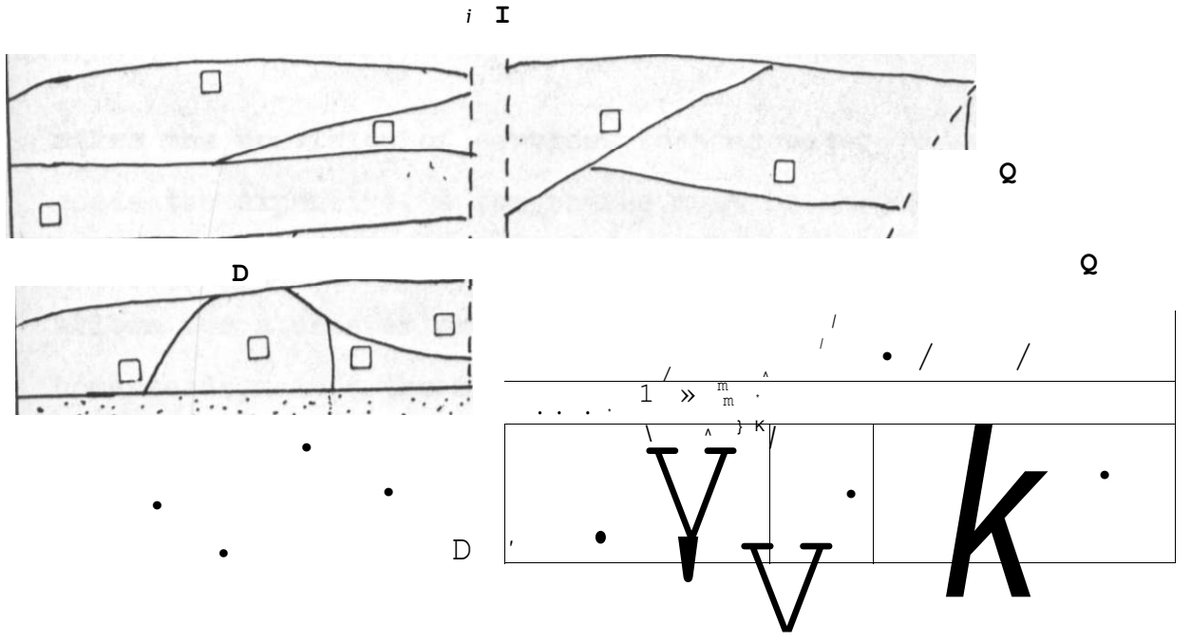
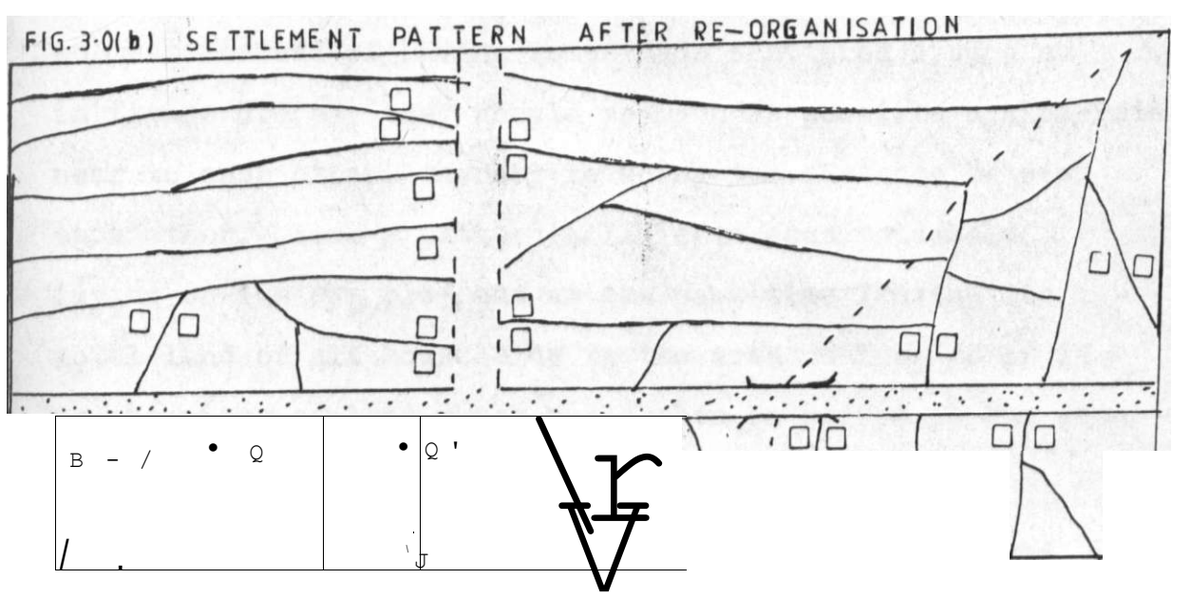


FIG. 3·0(b) SETTLEMENT PATTERN AFTER RE-ORGANISATION



• INDIVIDUAL HOMESTEADS

FOOT PATHS

STREAM

TRUCKS (MOTORAfILE)

PLOT BOUNDARIES

makes the provision of services such as water, electricity, roads too expensive, a compromise must be struck between the existing settlement pattern (figure 3.0(a)) and that which allows for a cheaper way of providing services to individual homesteads, since the main goal here is to transform the rural areas to look more attractive to both the rural population and would be investors.

Consequently then, a settlement pattern similar to the hypothetical one (figure 3.0(b)) should be developed so that instead of having homesteads scattered around as in figure 3.0(a); they should as much as possible agglomerate near to each other, thereby reducing the distance between each other. Such a pattern will leave each household living on its own plot, but at the same time leaving the total land of all households in the area to look as if it is one piece of land which would then be worked as one group farm by tractors.

Additionally, their being near to each other would make it easier for the extension officers, family planning officials to visit them and offer all the necessary services required.

Alternative Re-organizational models:

The figures below - i.e. figures 3.1 and 3.2 show alternative models upon which development vis-a vis constraints can be optimised, at the same time making it easy for the development of public utilities.

Extension Saturation Projects:

Once the consolidation of household holdings and the reorganization of the settlement pattern has been successfully implemented, alternative farming practice that would optimise land shortage, climate, type of crops, farming income and population distribution in the division must be sought out. In view of this, the group farming approach should be encouraged.

In establishing these group farms, the following criteria have to be used:-

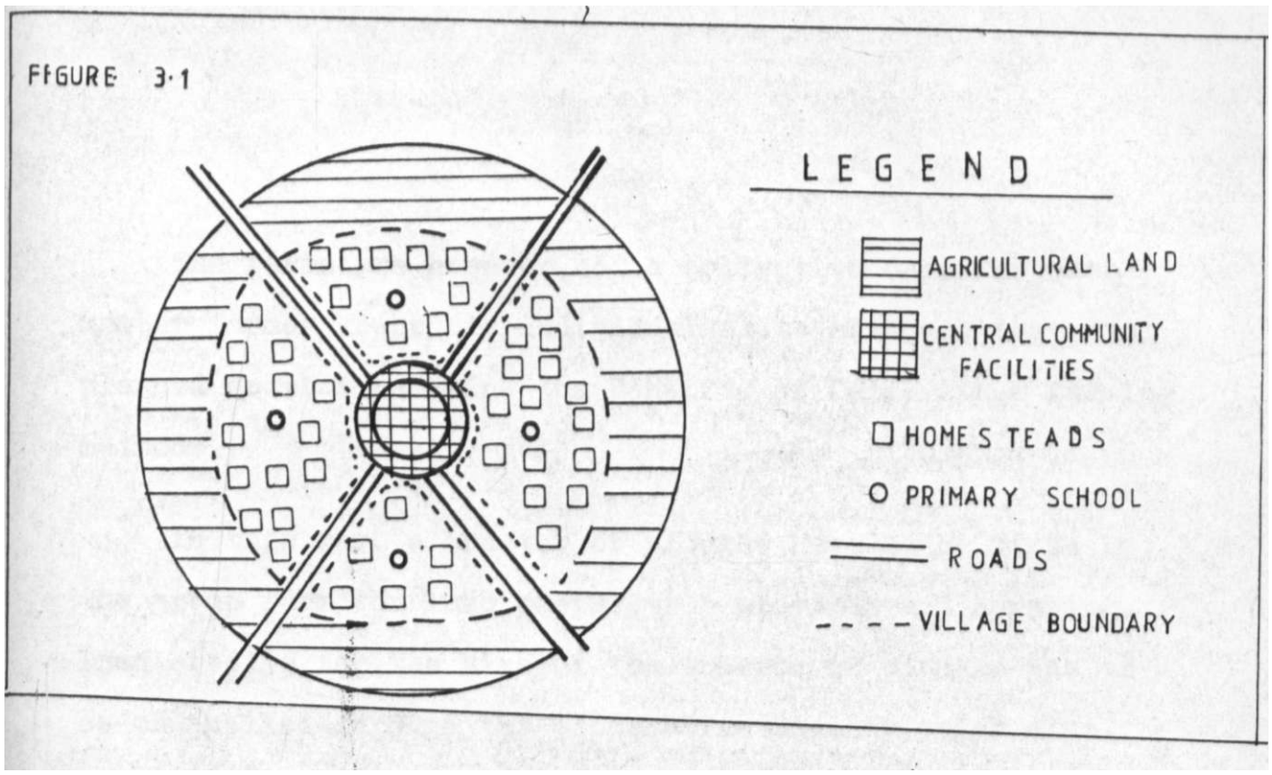
(a) The farmers must be members of a long established and credit worthy cooperative society.

(b) The Management Committee must have control over land and be able to allocate it without dispute

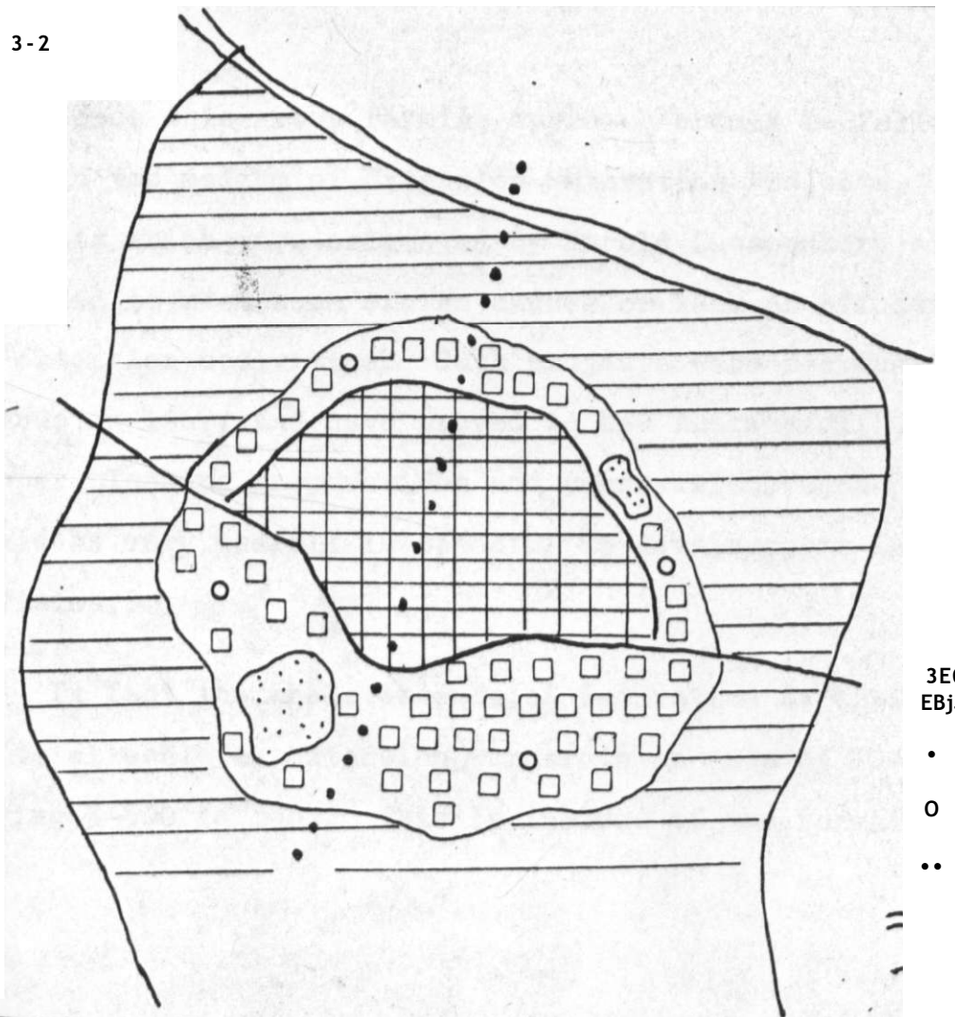
(c) The area must be sufficiently productive to justify investment of capital and give members a good return

(d) The area must be larger enough to employ mechanical cultivation unit and a manager efficiently.

FIGURE 3·1



FIGURE" 3 - 2



3E0 CENTRAL COMHU-
EBjJ NITY FACILITIES

• HOMESTEADS

O PRIMARY SCHOOL

•• BUS ROU TE"

TRUNK ROAD

•ACCESS ROADS

li>> OPEN SPACES

The farms are however not a collective ones for each member farmer keeps his individual plots although they are planned so that he gains the benefits of large scale farming methods.

In this way, a tractor or ploughs have to be hired by the group farm for land preparation planting and spraying. Then credits for the hire of the tractor or ploughs has to be channelled through the Cooperative Society which also handly all marketing process. This approach is advantageous in that it increases the number of contacts that a worker can make.

Hence this group farming approach should be followed through the medium of Extension Saturation Projects. Such projects which were orignated by Harold Duessenbery are designed to meet some of the causes or lack of effectiveness in extension activities. Such projects were started in Uganda in 1967, and have proved to be successful, so given proper planning preparations and supervision, such projects could be very usefull in speeding up developments in the division.

In fact the whole essence of Saturation Extension Projects is to allocate an extension worker to an area of 12-80sq.km having 3-500 farmers. This is instead of the normal pattern

of one extension worker dealing with an area of between 200-400 sq.km and a population of between 1500-10,000 farmers.

As it has been pointed out by Harold Duessenbery, the objectives of such Saturation Extension Projects are:-

(a) To increase the efficiency of the majority of farmers in the community.

(b) To increase yields per unit of land used and the overall productivity of the farm for the majority of the people.

(c) To align social pressure in support of the so called progressive farmers.

(d) To involve the extension staff in the process of farming and executing an intensive effective programme of work.

(e) To evaluate the response to an intensive programme.

In respect of all this, it is therefore recommended that the two programmes - i.e. group farm approach and the Saturation Extension Projects should be introduced in the division as an alternative farming practice that would help speed up development in the area. In the lower zone where the climatic conditions are not so much favourable for agricultural farming, irrigation farming on the basis of the above programmes is also recommended.

However for all this to be carried out effectively, the infrastructure of markets input supplies, transport and credit facilities must be readily available. There must also be innovations so as to warrant quick results.

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CHAPTER 4

Proposals and Recommendationst-

The study has clearly demonstrated that land pressure particularly in the coffee-banana zone is a serious problem in the division. It is in this zone where the vast of the population is heavily concentrated. As a result a household of five members has on average a farm plot of 0.2 hactres. This plot size is inadequate to carter for the five family members. The consequences have been cultivation along water course, destruction of catchment forests and trees, cultivation of hilly areas all which amount into serious soil erosion and drying up of some streams and rivers. In this zone therefore, the following recommendation are made:-

j. Promotion and encouragement of raising grade cattle. This will be useful not only in improving the peoples' diet, but also as another source of income by selling the milk. This type of mixed farming will be a good diversification from depending entirely on coffee as the only source of income.

4.2 Growing of both napier and elephant grasses on hilly and eroded areas. This will help in preventing soil erosion and also be used for stall-feeding the graded cattle.

4#3 Introduction of modern bee-keeping in the hilly areas and in the forests. This can be done with assistance of the graduates from the Olmotonyi Forest Training Institute in Arusha. Since the division is very potential for bees, this project if well planned and managed will be another source of income and employment to those landless ones and the others. It will also be another diversification from depending on coffee only.

4^4 Encouragement of small-scale industries. This can be done by giving technical advice freely, granting loan on liberal conditions and creating opportunities for marketing of products. The small scale industries which can be encouraged are carpentry, fruit canning, Tailoring, shoe-making, and quarrying. The raw materials for such proposed industries are locally obtainable and are in large quantity.

4.5 Resettlement of the excess population to the less populated parts in the division and outside the division. In doing this two aspects must be seriously considered. These are the plot sizes and related to it is the total population of the settlement area. These two aspects are very important and call for proper planning of the settlement area, otherwise as population increase the same

problem of land pressure will also be experienced. But with proper planning the need for more land could be reduced if the settlement embarks more on small-scale industries instead of emphasising mainly on agricultural farming.

In the maize and mixed farming zone, various food crops and cash crops can be introduced. These would include crops such as cotton, finger-millet; castor, sunflower, millet, cassava, groundnuts together with raising grade cattle.

Most of these crops are draught resistance, and given the soil and climatic conditions of this zone, such crops would do very well. This sort of diversification will enable the division to free itself from the higher dependency on coffee and bananas as the main cash and food crops respectively.

In the lower zone where the climatic conditions are not so favourable for agricultural farming irrigation practices for the expansion of pastures and arable land is recommendable. The permanently flowing rivers of Rau, Uchira, Mue and Himo can be used as sources of water supply. Alternatively drilling of boreholes will also do well since the zone is very rich in underground water. Again since it is in this zone that the problem of land pressure is still non-existing; intensification of agricultural farming should be emphasised. Draught resistant crops such as cotton, castor, sunflower,

millet should also be encouraged. In addition, small scale industries including those to process the newly introduced crops should also be encouraged.

Furthermore, the tendency of the people in this zone to keep large herds of cebu cattle should be discouraged and instead they should be encouraged to raise more grade cattle. This is so because the milk yield from these cebu type is very little compared to the graded ones, and furthermore they accelerate the process of soil erosion in the area due to their large number.

4,60 General recommendatlons:-

Apart from the problem of land pressure, the study has also revealed that there are other factors which are detrimental to rural development in the division. It is from the awareness of these other factors as have been pointed out in chapters two and three that the following general recommendations are derived.

4-,61 Extension of field agricultural officers to ward and even to village levels.

4,62 Education to the farmers on modern farming techniques and inputs required. This need for modernising agriculture is very essential because of its obvious relationship with other activities. For instance improving market outlets for

farms products will have to be accompanied by locally proved methods of increasing production; farm supplies and equipment needed to increase production. Also improving roads has a little consequence unless there are services nearby which can lead into increased production. For further illustration, the figure below shows the complimentarity of the above facts underlying modernisation of agricultural farming.

FIGURE 4.1

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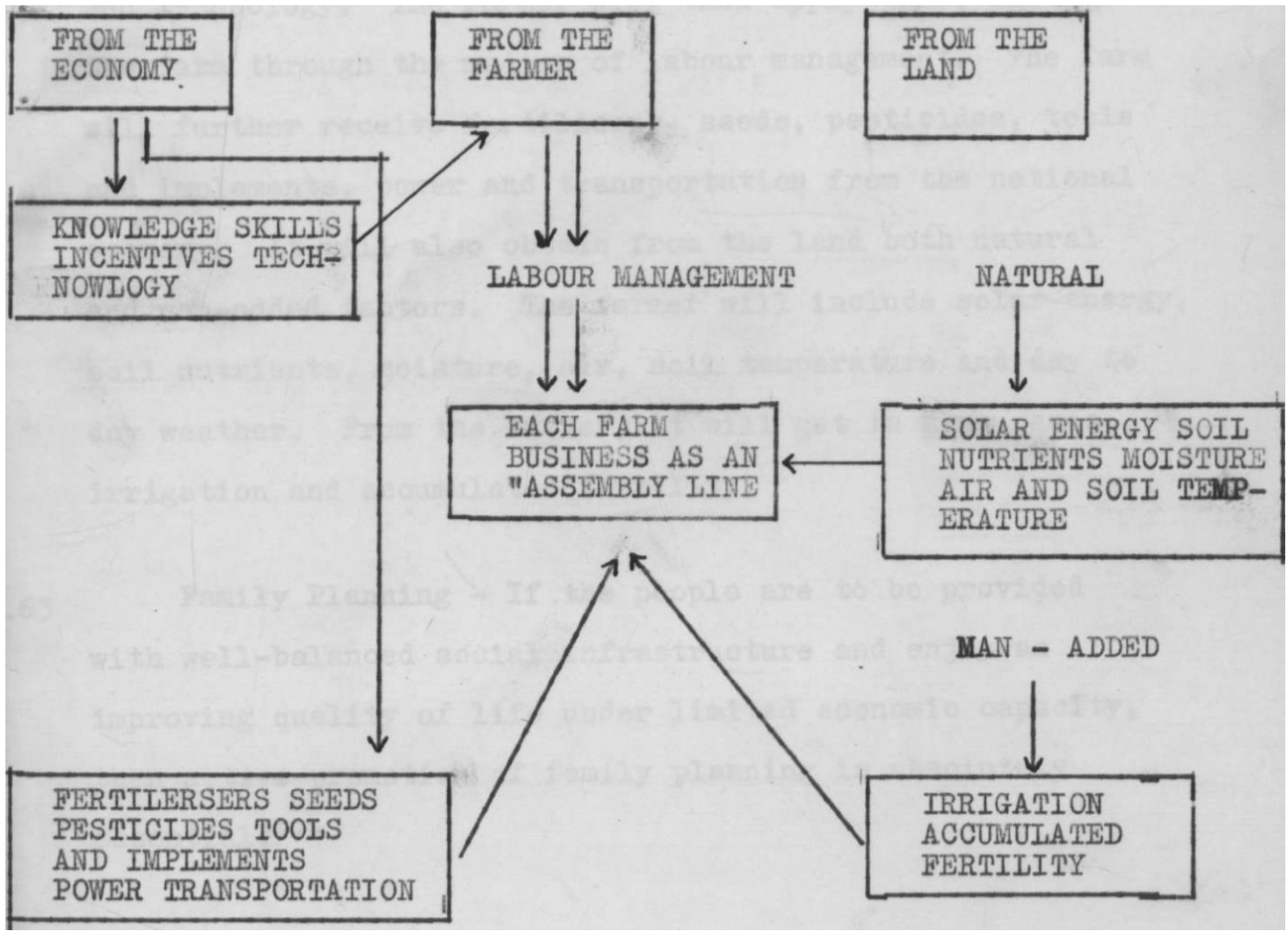

Sources Adopted from J.H.M. Kalifa as adopted from A.T. Mosher, "Creating a Progressive Rural Structure"

As it can be seen from the figure, the national economy will have to supply the farmer with knowledge, skills, incentives and technology. The farmer will then apply these factors to the farm through the medium of labour management. The farm will further receive fertilisers, seeds, pesticides, tools and implements, power and transportation from the national economy. It will also obtain from the land both natural and man-added factors. The farmer will include solar-energy, soil nutrients, moisture, air, soil temperature and day to day weather. From the latter, it will get in some cases irrigation and accumulated fertility.

Family Planning - If the people are to be provided with well-balanced social infrastructure and enjoy an improving quality of life under limited economic capacity, then active promotion of family planning is absolutely essential.

4.64 Water Supply - Improvement and consolidation of the water supply system is basic to the overall development of the division in terms of agriculture and social infrastructure this is particularly so since the basic orientation of such development will be contrinueing reinforcement of the agricultural sector for higher productivity.

Alternatively by using a more intensive methods s,in agriculture, there could be an increase in productivity. Hence these two factors could in turn take care of the increasing population. But it is probably too optimistic

to rely on these two alternatives to feed the increase in population as most of the increased productivity should either be invested in development projects or be used to improve standards of life of the existing population. This means that the settlement must have more land to absorb the increase in population or else a lot of the young people will have to move again; and to get more land may be difficult because of the neighbouring villages and because of the distance from residential area to agricultural area. Therefore, from this point of view and also from a point of view of the relations between the generations, it would be better to have smaller villages or settlements from the start which could eventually take care of the growing population.

However, in carrying out the resettlement schemes certain precautions must be taken. These include:-

(a) Convincing the affected people to move.

(b) Convincing the inhabitants in the proposed area of resettlement to accept new "settlers".

(c) To ensure that the ecology and environment of the new settlement area allows the new "settlers to carry on with similar activities as they were used, but on a better planned and organised system.

(d) Easy provision and availability of the basic infrastructural and social facilities.

As regards the indiscriminative felling down of trees along water courses, immediate arrangements by the government in collaboration with the local authorities in growing trees

besides rivers must be made. This is because most of the rivers and streams are drying up due to lack of trees. Since availability of water resource which is a very important resource for any type of development is directly related to the preservation and proper management of forest resources; appropriate measures must be taken to ensure that forests and trees along river sides are properly cared for and maintained.

4,66 Banning of land sub-division - The traditional practise of sub-dividing plots to sons once they marry has also been cited out as a factor leading to small plot sizes per household and hence lowjy-ield perunit area. Hence it is recommended that such practise should be absolutely discouraged. Only the last born son should have the exclusive rights of inheriting his parent's plot, and the elder ones should be encouraged to engage themselves more on non-agricultural activities, and must look for their own area to settle outside the family land. If this proposal is successful, it is hoped that the problem of having very small plots will be alleviated although not totally solved.

Infrastruetural development-Maximum use should be made on the existing infrastructure in the densely settled areas through improvement and extension on the basis of the avaluated potential and workability.

4.68 Industries-Small scale industries based on agriculture should be promoted to provide alternative employment to the growing labour force.

4.69 Education-Women in the villages should be given more education, especially regarding nutrition child care and home management.

The above proposals and recommendations are a reflection of the nature of the existing problems which hamper rural development in Vunjo West division. Hence to implement all these proposals, money will have to be secured and spent. In fact most of the funds needed for the development programs has to come from the government and other parastatal organizations such as Tanzania Rural Development Bank and Small Industries Development Organization (SIDO). Also individuals should be encouraged to invest in the programs on Cooperative basis. It is no doubt that such programs are bound to raise a lot of criticisms. Such criticisms are inevitable, but if they are constructive ones, they will help in revealing other problems which might have been missed by the implementors, and hence solutions for them will be sought.

CONCLUSION:

As was expressed in the introductory chapter, the aim of this study was to find out ways and means by which the existing problem of land pressure in Vunjo West division could be resolved.

In the process of doing so, the problem of defining the term land pressure came up. This problem was resolved by employing the concept of "carrying capacity" which determines the number of people that can live on a certain area of land without environmental destruction given the level of technological advancement.

But since carrying capacity is not fixed as it could either expand or decline through natural or man-made circumstances such as technological improvement, a constrant re-assessment of the capacity of the land is necessary.

In respect to all] these, the main strategies to resolve the problem of land pressure have been considered to be firstly an introduction of rural transformation programme which will incorporate an agricultural development strategy through land use reform programme.

Secondly the introduction of small scale industries including those to process the new proposed crops to be introduced in the division. A resettlement programme for the extra rural population has also been recommended together with a Social Welfare development programme involving educating the rural people on family planning.

It must be emphasised that priority should be on improving the agricultural production and the basic infrastructural facilities. In this way the farmers should be induced to adopt new techniques in order to increase production; and the number of agricultural field extension officers should be increased to ward and village levels to teach and guide the farmers.

Once agriculture is improved, the extra population will not be needed as farmers, hence to utilise them, small scale industries should be promoted and encouraged. Hence credit facilities should be secured not only for agricultural development, but also for the development of small scale industries.

All these measures would act as employment opportunities and will thus absorb the extra agricultural population thereby reducing the problem of land pressure in the division due to rural overpopulation.

For the resettlement programme, careful and proper planning of the new settlement area by taking the major aspects of plot sizes and total population to be settled is extremely important. To neglect the two aspects would put the new settlement into the same problem of land pressure after a period of time as population will always grow.

There is no doubt therefore that despite the fact that this study has focused mainly on Vunjo West division, the recommendations would hopefully be useful in some parts of Tanzania having similar environmental and socio-economic conditions but facing the same problem of land pressure.

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"LAND PRESSURE AS A MAJOR CONSTRAINT IN RURAL DEVELOPMENT. A CASE STUDY OF VUNJO WEST DIVISION MOSHI DISTRICT TANZANIA".

INDIVIDUAL QUESTIONNAIRE SURVEY.

1. **Occupation:**
   - (1.) Peasant farmer
   - (2.) Civil Servant
   - (3.) Others (Specify).

2. **Number of persons in the family:**
   - (1.) 0-2
   - (2.) 3-4
   - (3.) 5-6
   - (4.) 7T8
   - (5.) Above 8

3. **Sources of income:**
   - (1) Coffee
   - (2) Salary/Wages
   - (3) Help from working sons and daughters
   - (4) Other (Specify).'

4. **What is your farm size? (hactres)**
   - (I) 0.1 - 0.5
   - (2) 0.5 - 1.0
   - (3) 1.0 - 1.5
   - (4) 1.5 - 2.0
   - (5) 2.0 - 2.5
   - (6) 2.5 - 3.0
   - (7) Above 3.0

APPENDIX I

5. What is your average annual total harvest of Coffee, maize and beans?

(1) 0-3 bags
(2) 3-7 "
(3) 7-10 bags
(4) More than 10 bags

6. As regards question five, how much do you sale and how much do you store for consumption?

7. What is your average total annual income? (Tsh.)

(I) 100.00 - 500.00
(2) 501.00 - 1000.00
(3) 1001.00 - 1500.00
(4) 1501.00 - 2000.00
(5) 2001.00 - 2500.00
(6) 2501.00 - 3000.00
(7) 3001.00 - 3500.00
(8) 3501.00 - 4000.00
(9) Above 4,000.00

8. Do you think the population in this division is growing very fast and causing problem?

(1) Yes
(2) Wo.

9. If "Yes" for question 8 what do you think is the best to do?

APPENDIX I

(1) Develop more agriculture

(2) Develop Small Scall industries in rural areas.

(3) Develop large Scale industries in urban areas.

(4) Reduce number of children per family.

(5) More people to the less populated areas in the country.

10. What do you think the division need to do in order to improve people's living conditions?

(I Have all weather roads

(2 Improve and increase health services.

(3 Provide piped water

(4 Introduce small scale industries.

(5 Provide better and more materials for primary school.

(6 Improve housing conditions

(7 Provide telephone services.

(8 Provide library services

(9 Rural electrification.

(10) Improve and increase bus services

(11) Encourage Cooperative shops.

(12) Provide better organised market to self-[1]* agricultural products.

(13) Build more Community Centres.

(14) Increase the number of Secondary schools.