

T I T L E O F D I S S E R T A T I O N

Intra-rural Migration and Resource Development on the
Tonga plateau of Southern Province, Zambia: 1960-1980

by

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C O P Y R I G H T D E C L A R A T I O N

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This dissertation represents my own library and fieldwork research. It has not previously been submitted for a degree at this or another University. All maps, graphs, and tables, unless where stated are as a result of the fieldwork research conducted by me for the sole purpose of producing this dissertation.

Signed... 

This dissertation of Charles Moono Kubinda is approved
as fulfilling part of the requirements for the award of
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DEDICATION

To my late Father and Sister, Shadreck and Margie respectively, my lovely sister, mother and brother who have always remained a great source of inspiration to me during my entire study period.

ABSTRACT

The study attempts to explore the role migration has played in the development of agricultural resources of Southern Province of Zambia between 1960-1980. This study used library and fieldwork data, the later data having been collected by the author through interviews with sixty people in two sample communities at each end of a major migration stream.

The study commences with a review of the various types of human mobility encountered in Africa, with special attention paid to the motivation for these. The basic concepts in the study of human mobility are introduced at this point. A framework for the study of the impact of migration upon resource development is developed with three contrasting theories introduced in preparation for testing of their relevance in the study.

The second and third chapters of the dissertation consider the context within which migration occurs in Southern Province. Chapter Two considers the environmental basis for migration and resource development in the province and analyses the patterns of mobility reported in the 1969 census. Chapter Three provides a detailed background to the two study areas, Chief Moyo in Choma District and Chief Chikanta in Kalomo District. It explores the possibilities and limitations of the physical and economic environments in the two areas. This is to allow a deeper insight into the two areas as they provide the two sample areas on which the dissertation is based.

Chapter Four is the focus of the study. This examines in detail the relationship that obtains between migration and resource development in the two study areas. The agricultural trends in the two societies are outlined and the changes in production by the migrants and non-migrants interviewed are analysed. This chapter investigates the characteristics of the migrants, in particular their access to land, labour and capital and the influence of these variables upon changes in production due to migration. This analysis shows that migration had a mixed impact in the source area, i.e. production increased at the sample level, but declined at society level; while in the destination there was overall increased production both at the sample level and society level.

The study concludes by considering the implications of such types of migrations for Zambia in terms of resource development. It points out that most of the intra-rural migrations that occur in the country are of the selective nature and as such impoverished areas tend to lose good farmers into areas where there are better farming and marketing opportunities, thereby increasing the development gap between the two areas.

PREFACE

A period of anxiety, hardwork, careful and thoughtful thinking, and at times despair, has culminated into the production of this dissertation. The significance of migration studies in the ongoing process of development in Zambia, and indeed in Africa cannot be over-emphasized. Migration of human population is as old as man himself. During pre-colonial times, man in Africa migrated to adjust to his environment. He lived in close symbiosis with the environment. Although man now seems partially to be in control of his environment, the process of migration has not been abated; if anything, with the revolution in transport systems, man has become more mobile. His insatiable appetite for social, economic, political and cultural happiness has hitherto reached alarming proportions. This has provided alot of planning problems in many African countries. Migration of human population should therefore be understood within the planning context of each National Development Plan, especially in Zambia where annual population growth rate is as high as three per cent per annum.

Migration of human population is generally recognized as an integral part of the process of socio-economic development. Where there is an imbalance in the distribution of factors of production, it ensures the mobility of these factors between regions and occupations, especially labour and its associated human capital. The

need to understand the interrelationships between the process of migration and its impact on the source areas and destinations motivated me to undertake this study. This study is amongst the few in Zambia that have tried to examine the phenomenon of migration from this angle. Most studies of migration in the country have concentrated their efforts in examining magnitudes, patterns and determinants of migration. I therefore, hope that, this humble contribution to knowledge in migration studies in Zambia will provide enough food for thought, for both the academics and the planning bodies in the country.

The shortcomings of this study to a large extent are not of its own making. There is a serious absence of an agreed methodology in analysing consequences of migration upon the source and destination. Most studies have merely followed a descriptive analysis, e.g. Mabogumje 1972, and a few have attempted to combine both descriptive and quantitative analysis. I hope that this study will be understood within the context of the methodological shortcomings. It is also my sincere hope that those of you who will in the near future write on the same subject will stumble upon an acceptable methodological way of analysing studies of this nature.

I am indebted to a number of people for greatly helping me to produce this dissertation. First and foremost, I am very grateful to my supervisor, Dr. A.P. Wood for his continuous, tireless and selfless effort for helping me during the preparations of this dissertation.

There were times when I really lost direction as to what to do, but he was always there to personally guide me and give me assurance that one day all will be alright. At times, to my surprise, he sacrificed his Saturdays when he was supposed to be resting with his family to come and assist me. There is no other way I can thank him for this except to say I will always remain indebt to him for his contribution to my ascendancy in this cruel battle of academic supremacy.

Further acknowledgements also go to all those farmers, peasants and many people I interviewed in Muzoka Society and Chibizyi Society during my field survey. Their's was knowledge I could not get from any secondary sources. I also thank all the members of the Geography Department for their moral support. Special thanks in this regard go to all the Post Graduate students of the Department who weathered the same storm as the one I did, Chris Musampa for his encouragement when I looked desperate for support, Liomba Liomba, Paul Kayula Mulenga for the production of the graphs and maps and Mrs Lucy Musampa and Mrs Theresa Ngulube for typing the dissertation.

For financial support I would like to thank the University of Zambia which financed the entire study.

Final special thanks go the members of my extended family, to my dear wife Namunza, to a promising son Choolwe and to a sweet intelligent daughter Sibajene for giving me encouragement and a peace of mind in times of despair. To them, I say 'aluts continua', we shall conquer someday, we have just won a battle, the war is yet to be won!

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CHAPTER 1

INTRODUCTION: THE GENERAL FRAMEWORK

1.01 INTRA-RURAL MIGRATION AND RESOURCE DEVELOPMENT IN AFRICA

The phenomenon of migration in Africa has a long-rooted history dating back to precolonial times. Prothero identifies three types of mobility; movements that took place in the past, but which have now ceased to exist; movements that have continued from the past to the present day; and movements that have developed in recent times, mainly during the present century.¹ In precolonial times, movements of population were responsible for formations of kingdoms, diffusion of ideas, techniques, material equipment and the depopulation and repopulation of certain regions. Thus as Prothero puts it,

Legacies of past movements, resulting from warfare, slaving, devastation with consequent depopulation, are to be noted in patterns of the distribution of population in some parts of tropical Africa today and may thus be of contemporary significance. Sparse population and associated problems of development in Central Tanzania and in parts of West Africa are due at least in part, to depopulation in the past.²

Some of the movements of population that took place in the past, continued into the colonial and the post colonial era. Amongst these movements, two of them are most important; movement of pastoralist groups, and pilgrims.

The need to find pasture and water for stock by the Fulani in West Africa and by the Somali in North East Africa has seen a continued seasonal movement of these tribal groups. In the Muslim areas of tropical Africa pilgrimages have been and are still a common feature of lives of the people. Populations flow from West Africa into Arabia.³

The advent of colonialism ushered in a new era of administrative stability. This brought an end to some long-established types of population movements associated with conditions of political and social instability. At the same time, new forms of mobility developed.⁴ The development of agrarian capitalism in many colonial territories, the European alienation of African lands,⁵ in some parts of the continent, and in certain instances forced labour migrations, culminated into new forms of population movements. Other new forms of migrations included downhill movements, i.e. from remote and relatively inaccessible highland areas which offered protection in the past, to lowland cash cropping areas.⁶

The nature of these migrations also meant some changes in the utilization of resources. Some of the movements reflected differences in the distribution and development of resources. For instance the development of cocoa and timber

3

industries in Brong-Ahafo and other parts of Ghana had to await the influx of a large number of immigrants from other parts of Ghana, while increases in the out-put of cocoa exports was paralleled by corresponding increases in the growth of the immigrant population.⁷ Elsewhere, Mabogunje noted that "a wide variety of techniques have been transferred by immigrant groups into new areas and have helped to stimulate the production of new commodities or to increase the supply of existing ones in areas like fishing and agriculture."⁸

Sudarkasa and Mabogunje came to the same conclusion when the former discovered that "Ghana's economy was considerably expanded by the Yoruba migrant traders",⁹ while the latter discovered that "the expertise of Ghanaian migrant fishermen stimulated the fishing industry in Sierra Leon".¹⁰

In agriculture, evidence abounds. For example, the successful development of Khashm el-Girba agricultural scheme in 1964 is closely associated with the great influx of western Sudanese who migrated into the area.¹¹ Buganda's cotton and coffee fields largely depended on immigrants.¹² It is therefore not an over statement to say that a close relationship has existed and still exists between patterns of migration and resource use.

There are various forms of intra-rural mobility in Africa that can be identified; daily, periodic, seasonal and long-term intra-rural mobility, the latter being the concern of this dissertation.¹³ Distinctions can be made amongst these various types of mobility. Two terms here need to be distinguished as they are used quite often in the dissertation; these are migration and circulation. Migration refers to a permanent or semi-permanent change of residence for more than one year, while circulation refers to "a great variety of movements, usually short-term, repetitive, or cyclical in character, but all having in common the lack of any declared intention of a permanent or long-lasting change in residence."¹⁴

Similarly, there are various causes and motivations for these different types of intra-rural mobility that have been identified. Broadly, they can be categorized as follows:

environmental, socio-cultural, economic, and government induced migrations.

1.01.1 Motivations for migration

There are various types of models that try to explain the decisions to migrate.. One of these is the "push-pull" model. This attempts to show the relative attraction of two spaces,

the origin and destination of migrants, by considering the factors which will push and pull people in the areas of origin and destination. It also examines factors in between the two spaces interacting through migration; such as distance and physical or social obstacles that might influence an individual's decision to migrate. The model recognises that the potential migrant weighs the balance of positive and negative influences, prior to making the decision to move or not. 'Generally, migration takes place when an individual decides that it is preferable to move rather than to stay and where the difficulties of moving seem to be more than offset by the expected rewards. The process is a complex one since it involves evaluation of the situation both from the source area, and of the destination information about which is often incomplete.

Lee (1966), identifies four factors in the act of migration: these are, factors associated with area of origin, factors associated with area of destination, intervening obstacles, and personal factors.¹⁵ Thus any origin or destination area has, according to Lee positive elements or forces (the '+' symbols) which tend to attract or pull people to it, or keep those

already within it. Both areas have, at the same-time, repelling or negative elements ('-' symbols) which tend to 'push' or keep people away from it. The zeros represent forces which people are generally indifferent to.

Realizing the insufficient nature of his three forces to explain why people migrate or do not migrate, Lee introduced the concept of intervening obstacles. These are obstacles which may influence a person's decision to migrate or not to migrate; such obstacles include distance, transport costs and government restriction over population movement. These intervening obstacles will vary in their influence upon different persons and classes of persons in a given area and society (see fig. 1.1). Thus Lee concludes that:

The decision to migrate therefore, is never completely rational, and for some persons the rational component is much less than the irrational. We must expect therefore, to find many exceptions to our generalizations since transient emotions, mental disorder, and accidental occurrence account for a considerable proportion of the total migration.¹⁶

We now look at some of the causes of migration outlined above.

1.01.2 Environmentally motivated migrations

In many parts of East Africa, the search for grazing land and water by pastoral groups has led to conflicts over the use of water and land resources with sedentary populations, thereby detonating the desire to migrate by either one of

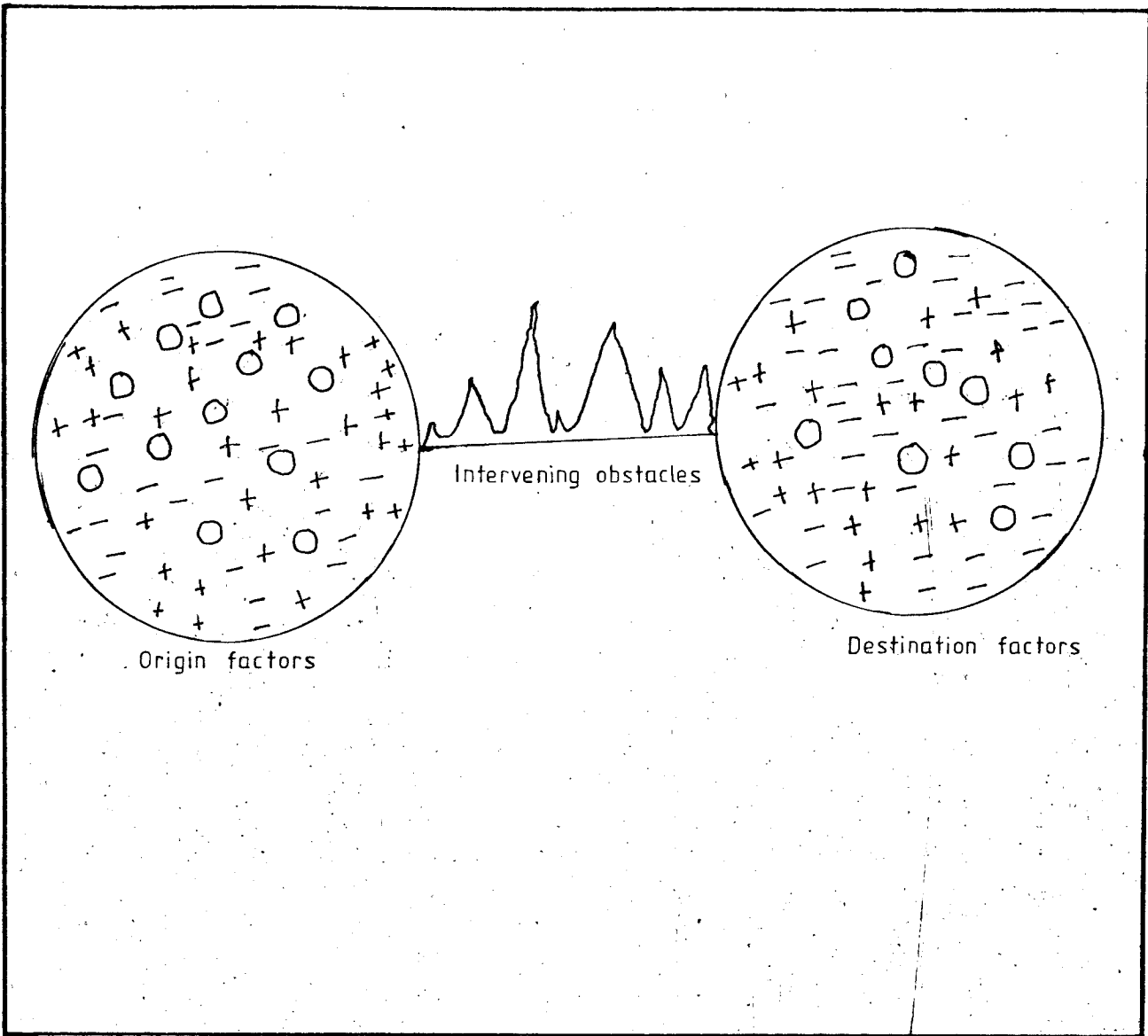


Fig.1.1 : ORIGIN-INTERVENING OBSTACLES-DESTINATION MODEL OF MIGRATION
(Source: Lee,1966)

the groups at one point in time or another in the history of the area. In certain instances "forced" overstocking of livestock by pastoral groups has led to deterioration of the land.¹⁷ For example in Kenya, the continued desire to migrate from the more crowded highlands by the cultivators on to the edges of the range lands has produced a cumulative deterioration of the land and a further desire to migrate.¹⁸

Infestations of large tracts of land with tsetse flies has led to depopulation of many parts of Africa. In North East Uganda, the depopulation of the fertile Dod county due to the presence of tsetse flies resulted into over population of the areas of relocation thereby destroying the environment.¹⁹ Population pressure and soil exhaustion in many instances have acted together to motivate intra-rural mobility in Africa. For instance, in Sokoto Province in Nigeria, land hunger and the resulting changes in land use motivated migration to sparsely populated areas within the Sokoto Province,²⁰ while in Senegal peanut monoculture resulted in soil exhaustion and a relocation of the production areas.²¹

Movements resulting from drought and flooding are equally common in Africa. For instance, the seasonal movement of the Lozi in Zambia is a result of the seasonal flooding of the Zambezi river.²²

In the 1970s, Biheramulo district south of Bukoba in Tanzania experienced a migration due to drought,²³ while drought in Ethiopia, led to the resettlement of many famine victims.²⁴

1.01.3 Socio-cultural motivated migrations

Although tribal warfares have ceased to act as major motivational factors in migration in Africa, politics still play a role in creating migrations thereby producing large numbers of refugees. The majority of Africa's refugees are rural to rural.²⁵ Major political upheavals include the Chad civil war since the early 1970s, and the Eritrean war since the late 1960s. Most of the refugees that are created from these political upheavals are resettled in refugee camps or settlement schemes where they are expected to feed themselves.²⁶

1.01.4 Economically motivated migration

Although man in Africa has often remained in very close symbiosis with his physical environment, and numerous migrations have been caused or motivated by needs to adjust to his environment,²⁷ economic factors have also played a role in inducing migrations. In West Africa, in the precolonial and colonial era, the desire to obtain control of trade routes resulted in migrations from the interior to the coast.²⁸

In then Northern Rhodesia and now Zambia, Colson found out that two rural areas attracted settlement. One was the Luapula river region whose rich fisheries supplied and still supply the markets of the Copperbelt Province. Along the Kafue river, she also found out that commercial fishing, though on a smaller scale, brought settlers from various parts of Zambia.²⁹

Cash crop regions have by far attracted the largest number of intra-rural migrants. In Sudan, the development of Khashm el-Girba agricultural region, witnessed the migration of Western Sudanese from areas of population concentration.³⁰ In 1948, thirty-four per cent of Buganda's total population consisted of migrants from other parts of Uganda, Tanzania, Sudan and Rwanda-Urundi who either worked in cotton or coffee fields.³¹ In Zambia, the maize growing area of the line of rail belt attracted the Ndebele and Shona from Southern Rhodesia, and various other tribesmen from Malawi and within Zambia.³²

1.01.5 Government policy induced migrations

Although there are very few African governments which have designed policies which directly encouraged population redistribution, several socio-economic policies bear on population

distribution; these include rural development programmes, farm settlement and resettlement projects.³³ These types of programmes have been particularly common in Tanzania (Ujamaa), and Zambia (Intensive Development Zones, and Rural Reconstruction Centres).

1.02 THEORIES OF MIGRATION AND RESOURCE DEVELOPMENT

The advent of colonialism did not only usher in a new administrative machinery but ushered in a new economic order as well. At the same time as the continent was being brought into the cash economy, the nature of the economic development that was evolving was loopsided. Dual economies evolved; certain regions, especially coastal areas and cash crop regions were developed faster than the others in order to satisfy the external economies of the colonial powers. In addition to this economic structural imbalance, in some areas land alienation and the creation of African reserves and landless African tenant farmers, meant that regional development inequality widened.³⁴

These regional development inequalities have had a great influence on population distribution and redistribution, both in the past and present. Since the colonial days, there has been an influx of migrants from less developed

to more developed regions.³⁵ In areas where land for agriculture and cattle rearing is the source of livelihood, major rural to rural migrations developed from densely populated districts into areas where land was available for agriculture and cattle rearing.³⁶

Internal migration has been known to be closely related to regional development, what is not yet clear is the nature of this relationship.³⁷ In this section, an attempt is made to examine the nature of this relationship. Three theories emerge from this discussion:

- (i) migration widens regional per capita income inequality,
- (ii) migration narrows regional per capita income inequality, and
- (iii) the impact of migration on regional per capita income inequality is indeterminant.

To analyse them, two hypothetical agricultural regions are given; one, low-income growing, and the other, high-income growing. They are described below:

1.02.1 Low-income growing region

This is a region with a low per capita income. The economy is generally depressed with predominantly labour-intensive methods of agriculture. Capital and modern equipment may

be lacking, while per capita arable land tillage is low. There is a high population concentration with a generally unattractive economic environment.

1.02.2 High-income growing region

This is a region with a high per capita income. Semi-mechanized agricultural methods are in operation with adequate modern farming equipment. The per capita arable land tillage is quite high, while population concentration is medium. The area has a generally unattractive economic environment.³⁸

1.02.3 Migration widens regional per capita income inequality

The proponents of this theory argue that the low growing region will tend to experience a net outflow of population to the high growing region because of the generally low socio-economic potential in the area. This outflow of migrants if continued will in the long run accentuate the already apparent gap in per capita income. They further assert that, migration per se will not widen the gap, but the loss of the attributes which the migrants possess and transfer in the act of migration, such as education, age, skill and capital resources, will widen this gap. Since migration is mostly selective of the young, energetic, educated and skilled, and since the low growing region will experience few in-migrants, a less favourable population composition, at least with

respect to the attributes possessed by the migrants, will result in the low growing region compared to the high growing region.³⁹ Thus it has been argued that internal migration, induced by small, isolated pockets of prosperity in a country in which development is extremely unevenly distributed, has the perverse effect of accentuating regional inequalities.⁴⁰

Taking a more extreme view of the argument, Amin (1974) concluded that in Africa and elsewhere migration and circulation have always impoverished the region of origin, while benefitting the region of destination.⁴¹ This is so because migrants are exploited by the host society in terms of status accorded and monetary rewards. What little wealth the migrants do acquire is achieved at the expense of their home areas where subsistence agriculture is often disadvantaged due to their absence.⁴²

Marsh (1967) recognized that migration will continue to contribute to a situation whereby the existing pattern of regional welfare is reinforced in the high income growing region with the low income region hurt more. According to him, early gains from out-migration in the low per capita income regions, such as lowering the surplus labour, underemployment, and relieving land pressure, might in the longrun result in

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serious labour deficit problems which may encourage further out-migration and declining purchasing power.⁴³

1.02.4 Migration narrows regional per capita income inequality

The defendants of this theory argue that, migration, far from widening regional per capita income differences, works as a mechanism of adjustment between two regions when inequality exists in resource opportunities. This may happen in two ways:

- (i) when migration flows from the low growing regions to the high income growing regions. The flow of persons of probable "low quality" (in terms of education, advanced age, occupational skill and status, and capital resources) to the high growing region tends to depress per capita income there, while the outflow from the low growing region tends to depress its excess labour supply, tending here to raise per capita income.⁴⁴ Okun and Richardson argue that,

If the marginal product of the out-migrants is lower than the average for the region as a whole, it is evident that per capita income will rise, provided that not too drastic a reduction in the proportion of the population in the labour force has resulted from their exit. Moreover, the out-migration of workers may cause the marginal productivity of the remaining workers, to rise, because of the resulting increase in capital-labour and in arable land-labour ratios⁴⁵

(ii) When migration flows from high growing to low growing regions. A high growing region was described as a region which is economically advanced, with skilled labour and capital resources. It is therefore assumed that whatever form of migration will take place will involve people of an educational standard higher than that of the economically more backward area, and people with skill and capital resources; as such, the out-migrants from such a region will tend to be of higher "quality" and potential productivity than the average for the backward region. In itself, this will equalize the factors of production such as labour and capital resources through transfer by the migrants, and not accentuate them as earlier stated.⁴⁶

For these reasons both types of migration flows outlined above may in general tend to help rather than hinder a low growing region both in the immediate and distant future and will tend to lower the per capita income of the high growing region while raising the per capita income of the low growing region thereby narrowing the differences in per capita income between the two regions.

1.02.5 The impact of migration on regional per capita income inequality is indeterminant

Rather than examine the question of the impact of interregional migration on regional per capita income from one angle it has been argued that, the impact of migration on regional per capita income inequality is more complex than the selectivity based arguments presented in the first and second theories.⁴⁷ To illustrate this point, Okun and Richardson, formulated a model with four types of regions, low-income stagnant, low-income growing, high-income stagnant, and high-income growing (see fig. 1:2)

The model

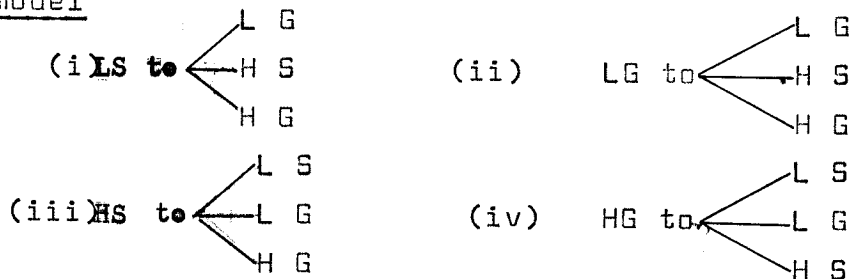


Fig. 1.2 Migration streams model

Source: Okun and Richardson 1961:308

According to Okun and Richardson, a "stagnant" region is here defined as one in which there occurs over time relatively little or no increase in per capita income; a growing region, correspondingly is one in which there is sustained secular improvement in per capita income.

Migration can occur in twelve different directions as can be seen in fig. 1.2. Depending on the source, and the destination of the flow,

and the characteristics of the two places, and the attributes of the migrants and the volume of movement, the effects on regional per capita on the source and destination will be different. Different combinations of situations will give rise to different results as illustrated in the last section. Generally, Okun and Richardson concluded that all things being equal, migration will be from a low growing region to a high growing region, but this also depends on the level of development in a particular country since it determines the general characteristics of different regions. Mabogunje (1970) argued that migration is not always from the low to the high growing region but may be from the high growing region to the low growing region as evidenced in the Nigerian case in the 1952/53 census.⁴⁸ So, according to this theory, it is not very easy to determine the relationship between migration and regional per capita income inequality.

1;03 SIGNIFICANCE AND SCOPE OF STUDY

1.03.1 Significance

Undoubtedly, there has been a growing awareness of the role and importance of the study of intra-rural migration in recent years. However, despite this awareness little investigation has been made of the phenomenon of intra-rural

migration and its impact upon resource development especially in Africa.⁴⁹

The past twenty-five years have seen a rapid growth in migration studies in the Third World, and especially rapid growth in studies of the problems arising from rural-to-urban migration and the potential solutions to these problems. In contrast, little attention in Africa has been focussed on the field of intra-rural migration, either as a mechanism for the opening up new areas of colonization, or as a stepping stone towards subsequent urban development. Similarly, government roles in encouraging or restricting intra-rural migration have always remained ill-defined.⁵⁰

Migration has a number of implications for development, especially the distribution of development. In Zambia greater emphasis is placed on rural development as one of the ways of lifting both the economy through agriculture and the general standard of living of the bulk of the population. The significance of this study therefore lies in the fact that it tries to explore and understand how, through migration, changes in the combination of factors of production may be achieved. This in turn may lead to a better population distribution relative to available resources, such as land. Migration

is a most important means of increasing the utilization of resources which would otherwise remain idle, under-utilized or poorly utilized. It is also important as a means of diffusing new skills, new attitudes and new ideas to different parts of the country. In all, migration has to be considered both as a result of economic changes as well as a major factor influencing the economic and social process, in the essence *that it can, and does, influence the pattern of* economic activities - be they agricultural or commercial, the utilization of labour, and the level of living at both the origin and destination.

The long term effect of migration may be to raise the level of economic activity and therefore of per capita income, especially in the destination and at times in the source area thereby reducing the differential between the *two areas*. In Zambia, there is need to explore the role of migrants in the economic development of the country to enable the government to adopt appropriate policy measures to stimulate and develop the productive abilities of these migrants in the areas of resource development.

Essentially therefore, this is a study in rural development, and its importance cannot be overemphasized given the priority the government places on rural development.

1.03.2 Scope

The study focusses on two important aspects of migration and resource development; the identification of the pattern and magnitude of regional mobility in the rural parts of the Southern Province, and the assessment of the implications of mobility patterns for rural resource development and regional per capita income inequality in two sample areas in the Southern Province; Chief Chikanta in Kalomo District and Chief Moyo in Choma District. However, it has not been possible to comprehensively study the pattern and magnitude of intra-rural migration due to constraints in getting data in non-aggregate form. What has been achieved is the collection of data on migration streams and their characteristics for all the six districts in Southern Province, using the 1969 census data.

In the treatment of the relationship between migration patterns, resource development and regional per capita income inequality, the study considers the influence of age, sex, education, capital resources and other characteristics of the migrants and non-migrants upon the development of resources, especially agriculture, land and labour, in the destination and source areas. The effect of the different situations, such as infrastructure, land tenure, credit and extension

facilities in the two sample areas upon the impact of migrants is considered. Variations in agricultural production between the two sample areas over the past ten years are used to test the theories outlined above.

The choice of the study areas is based on the analysis of the 1963 and 1969 census data for Southern Province. This data reveals that in Southern Province, with the growth of population, movement has increased to frontier agricultural areas like Chiefs Siachitema, and Chikanta in Kalomo District and Chief Muchila in Namwala District. While these areas are gaining in-migrants, other areas, like Chiefs Hamaundu and Moyo in Choma District and some areas in Gwembe and Mazabuka Districts are losing people to these frontier areas. In order to carry out this study Chiefs Moyo and Chikanta were chosen since the pilot study revealed that most of the migrants from Chief Moyo were migrating to Chief Chikanta's area.

The study is divided in the following manner; Chapter Two examines the overall provincial rural to rural migration using districts as administrative boundaries. Focus in this Chapter is on magnitude, pattern, and the likely underlying causes for the pattern that emerges.

Chapter Three examines the physical, social and economic environments of the study areas in order to shed light on the underlying reasons for migration taking place from Chief Moyo to Chief Chikanta. It explores the possibilities and limitations of the two environments. Chapter Four examines the factors of production, land, labour, credit, extension, agricultural production and capital resources. In this chapter an attempt is made to examine how migration has affected the allocation and re-allocation of these factors, and what kind of impact this has had on both the source and destination. The last chapter, is a conclusion and summary of the four chapters.

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CHAPTER 2

PATTERNS AND MAGNITUDE OF INTRA-RURAL MIGRATION IN SOUTHERN PROVINCE: 1963-1969

2.01 INTRODUCTION

Southern Province of Zambia lying between 25° and 28° 47'E and 16° 10' and 18° S offers a diversity of both physical and socio-economic landscapes. The province covers an area of approximately 8.5 million hectares, 0.2 million¹ of which are under water, and has a total population of about 686,492.² These represent about 11.3 per cent and 12.1 per cent of the totals of Zambian land area and population.³ The province has a crude population density of 0.8 persons per hectare.⁴ Although the province is the third most urbanized in Zambia after the Copperbelt and Central Provinces, its population is still predominantly rural, 72.9 per cent.⁵

2.01.1 Physiographic regions

Physiographically the province can be divided into four broad regions:

- (i) the plateau (1000-1400 mm)
- (ii) the Gwembe valley (300-800m)
- (iii) the escarpment zone between the plateau and the valley, and
- (iv) the Kafue flats.⁶

Administratively, the province is divided into seven districts which have little or no bearing to the physiographic divisions of the province with the partial exception of Gwembe district (see Fig. 2.1)

2.01.2 Rainfall

Average rainfall distribution in the province can be divided into three broad areas:

- (i) North-western tip of the province covering part of Namwala district and the Kafue national park (900-1000 mm)
- (ii) The plateau area (800-900 mm)
- (iii) The rest of the province (below 800 m) see Fig. 2.2.

Generally speaking rainfall increases from the south to the north. The mean annual rainfall here ranges from just under 750 millimetres in the south to over 875 millitres in the north, and though subject to fairly wide variation in both total amount and seasonal distribution is, by the standard of the African savana regions, comparatively reliable.⁷ The pattern in the Southern Province is similar to the general pattern of rainfall distribution in the country as a whole. The moist Zaire air masses bring rainfall into Zambia from the north, getting drier as they move southwards. The southern part of the province is drier and suffers more easily from drought when the rainfall

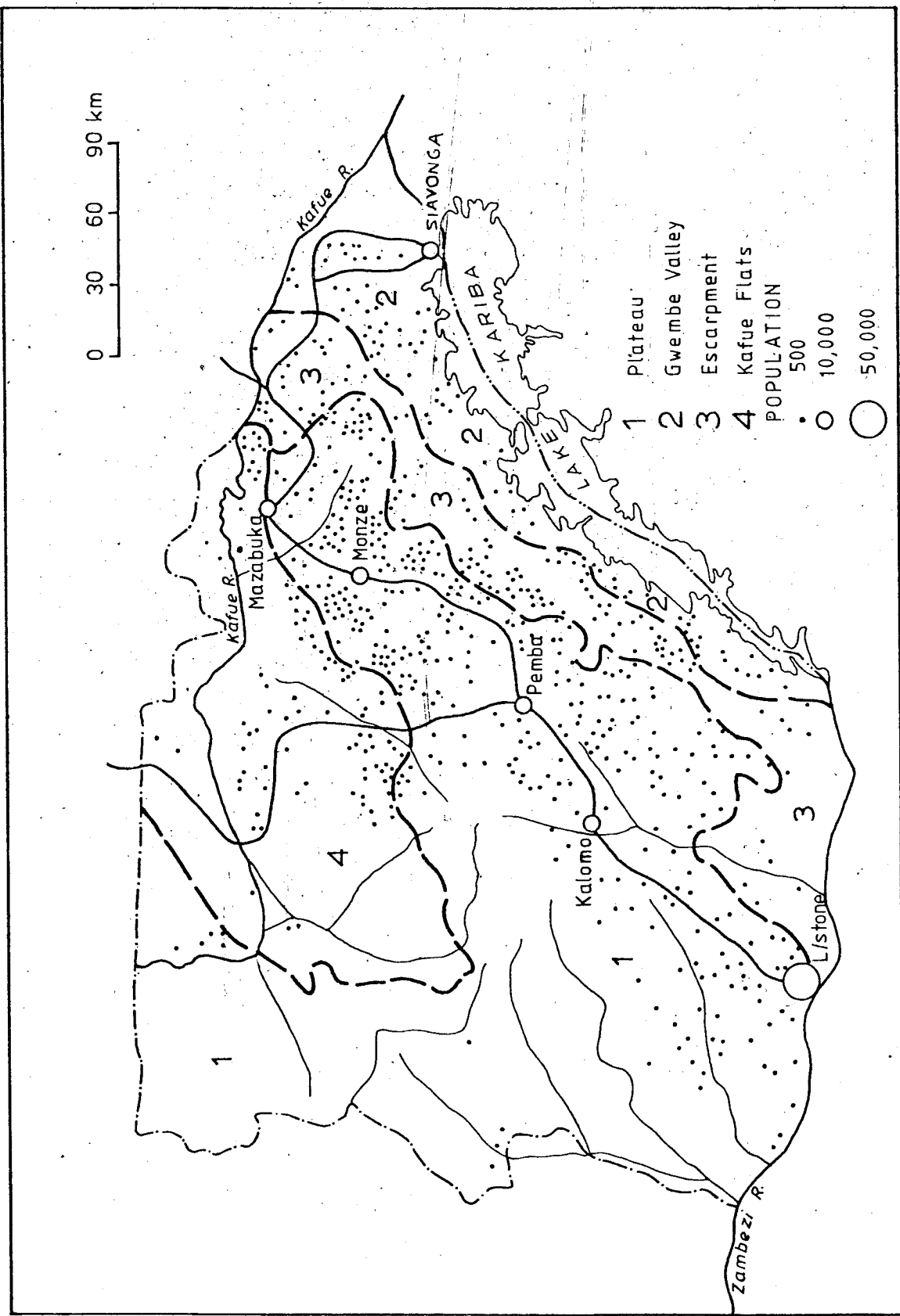


Fig.2.1 : POPULATION DISTRIBUTION (Source: Jackman, 1978)

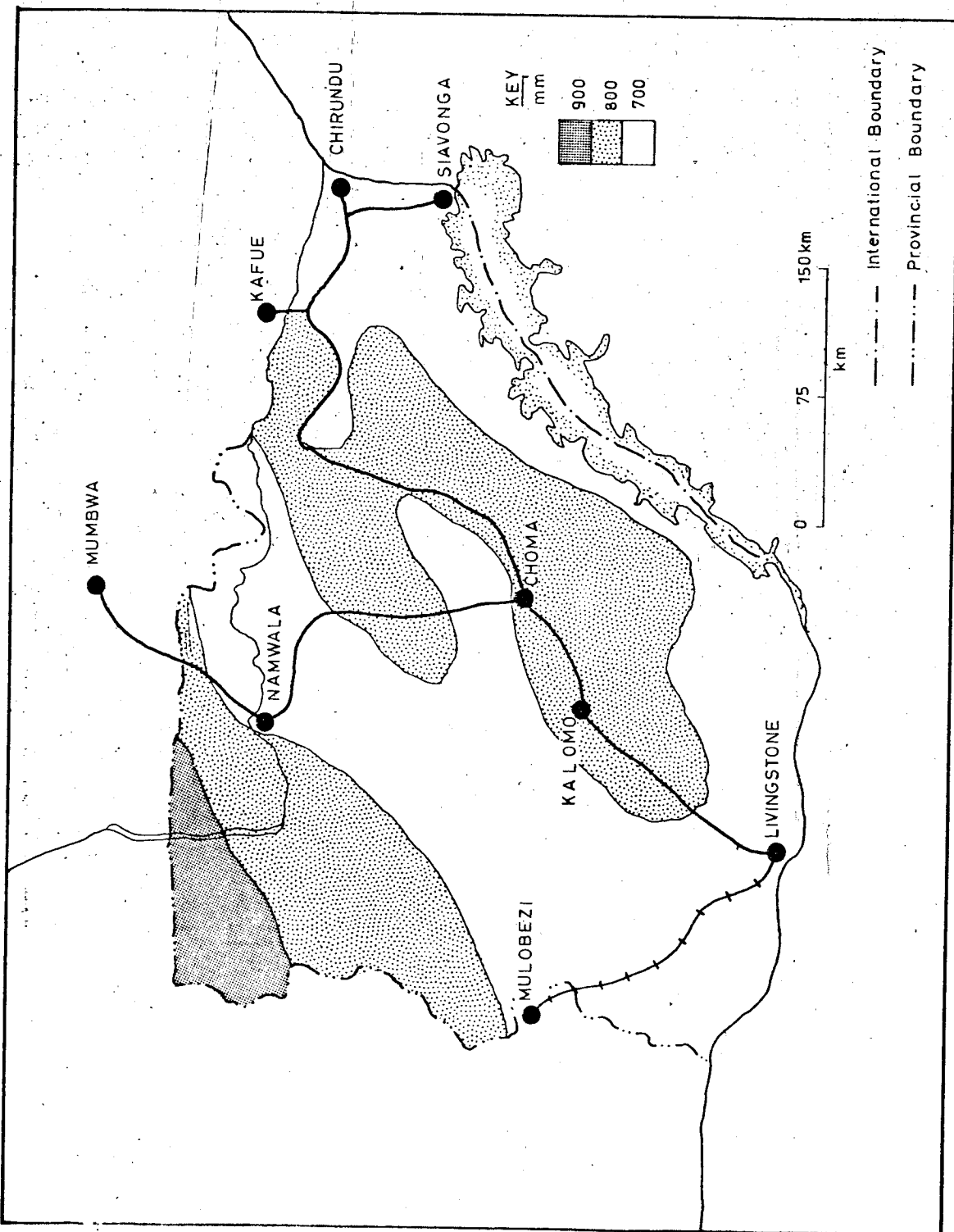


Fig. 2.2 : AVERAGE ANNUAL RAINFALL (Source: G. R. Z, 1968)

is below average.⁸

2.01.3 Soils

Two broad types of soils may be identified on the plateau. One category is the "plateau" soils, generally poor, leached, light and sandy. These soils are found in the south west of the Tonga plateau, from south of Kalomo to well north of Choma. Land here is quite flat. The rest of the Tonga plateau, from Pemba going north west, is characterised by quite fertile "Upper valley" soils (heavier reddish brown loams) and large "transitional" (between the two types) areas. Here the land is more rolling and, especially in transition areas, marked by more dambos-open, seasonally wet drainage depressions. The "Upper valley" soils are of greater fertility for cereals and provide better grazing than the soils of the adjoining plateau.⁹ The rest of the province is dominated by rock and rubble in the Gwembe valley and Barotse sands in the west (see Fig. 2.3).

2.01.4 Vegetation

Five broad vegetation types can be identified in the Southern Province

- (i) Miombo woodland
- (ii) Mopane woodland
- (iii) Munga woodland
- (iv) Mutemwa Baikiaea
- (v) Kalahari woodland

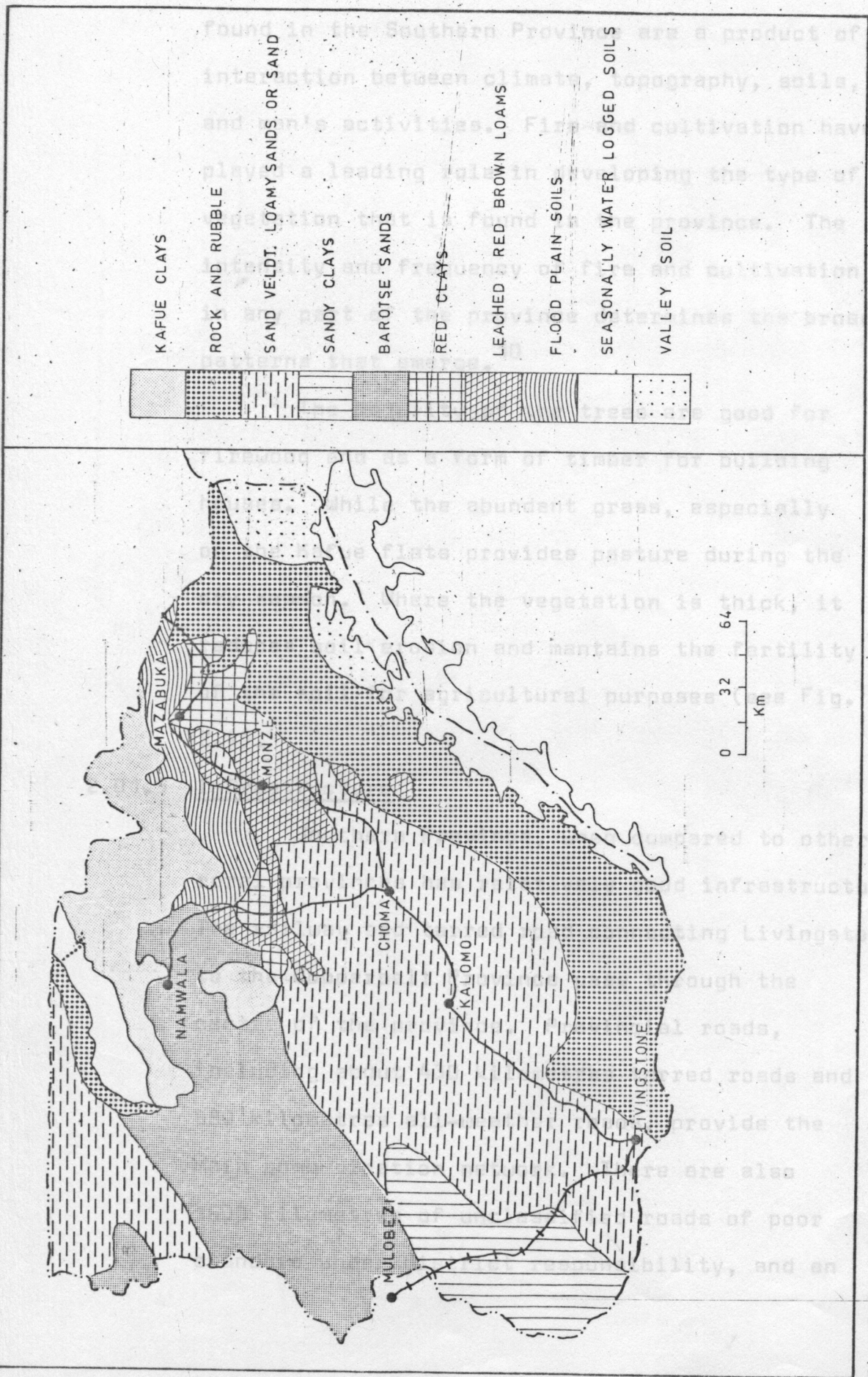


Fig. 2.3 : SOILS MAP (Source: G.R.Z, 1966)

The five broad vegetation types to be found in the Southern Province are a product of interaction between climate, topography, soils, and man's activities. Fire and cultivation have played a leading role in developing the type of vegetation that is found in the province. The intensity and frequency of fire and cultivation in any part of the province determines the broad patterns that emerge.¹⁰

The majority of the trees are good for firewood and as a form of timber for building houses. While the abundant grass, especially on the Kafue flats provides pasture during the dry season. Where the vegetation is thick, it reduces soil erosion and maintains the fertility of the soil for agricultural purposes (see Fig. 2.4).

2.01.5 Infrastructure

Southern Province, when compared to other rural provinces has relatively good infrastructure. The railway and tarred road connecting Livingstone to the Copperbelt Province pass through the centre of the province. Provincial roads, including about 430 kilometres tarred roads and 680 kilometres all-weather roads, provide the main communication network. There are also 1600 kilometres of unclassified roads of poor standard under district responsibility, and an

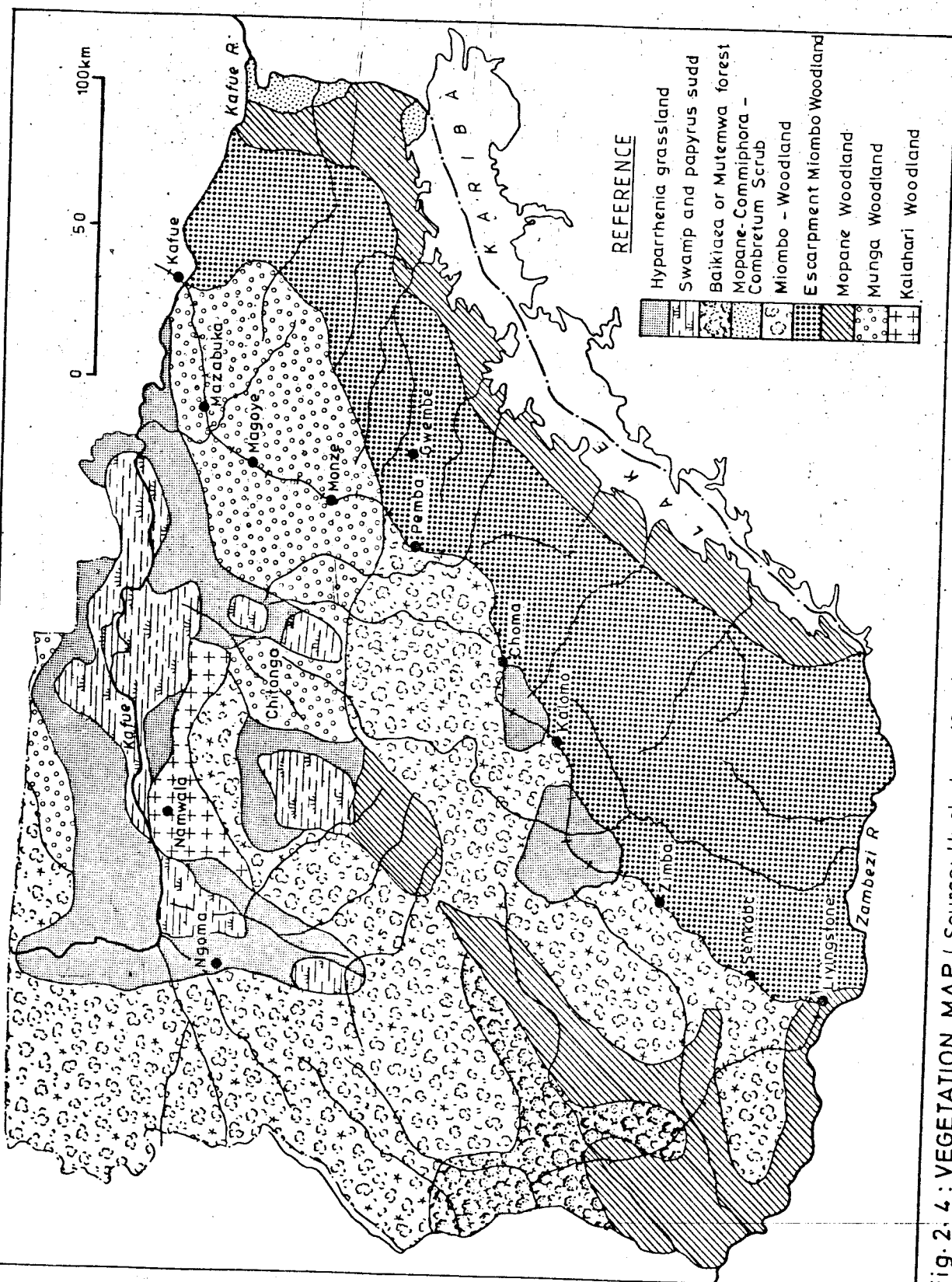


Fig. 2. 4 : VEGETATION MAP (Source: Huckabay, 1978)

unspecified length of earth roads maintained by rural councils.¹¹ Depots and maize sheds lie mainly along earthroads within rural areas. In some areas where road communication is poor, like the Gwembe District, access to depots is difficult. Depot facilities are particularly good for commercial farmers who are scattered along the line of rail and the road.

Water supply for both animal and human consumption remains a problem in the Kalomo District and the area to the west of Choma, (Mapanza and Macha areas). Basic education opportunities are adequate with most of the population within walking distance of a primary school. Hospital facilities are only adequate along the line of rail with rural populations having to travel long distances of up to 100 kilometres to see a doctor.¹² (see Fig. 2:5).

2.01.6 Population distribution

The geographical distribution of population in Southern Province closely relates to the physiographic divisions of the province, the resource potential and the prevailing distribution of social and economic infrastructure and opportunities for socio-economic progress especially access to the market.

Three broad division of population distribution can be identified:

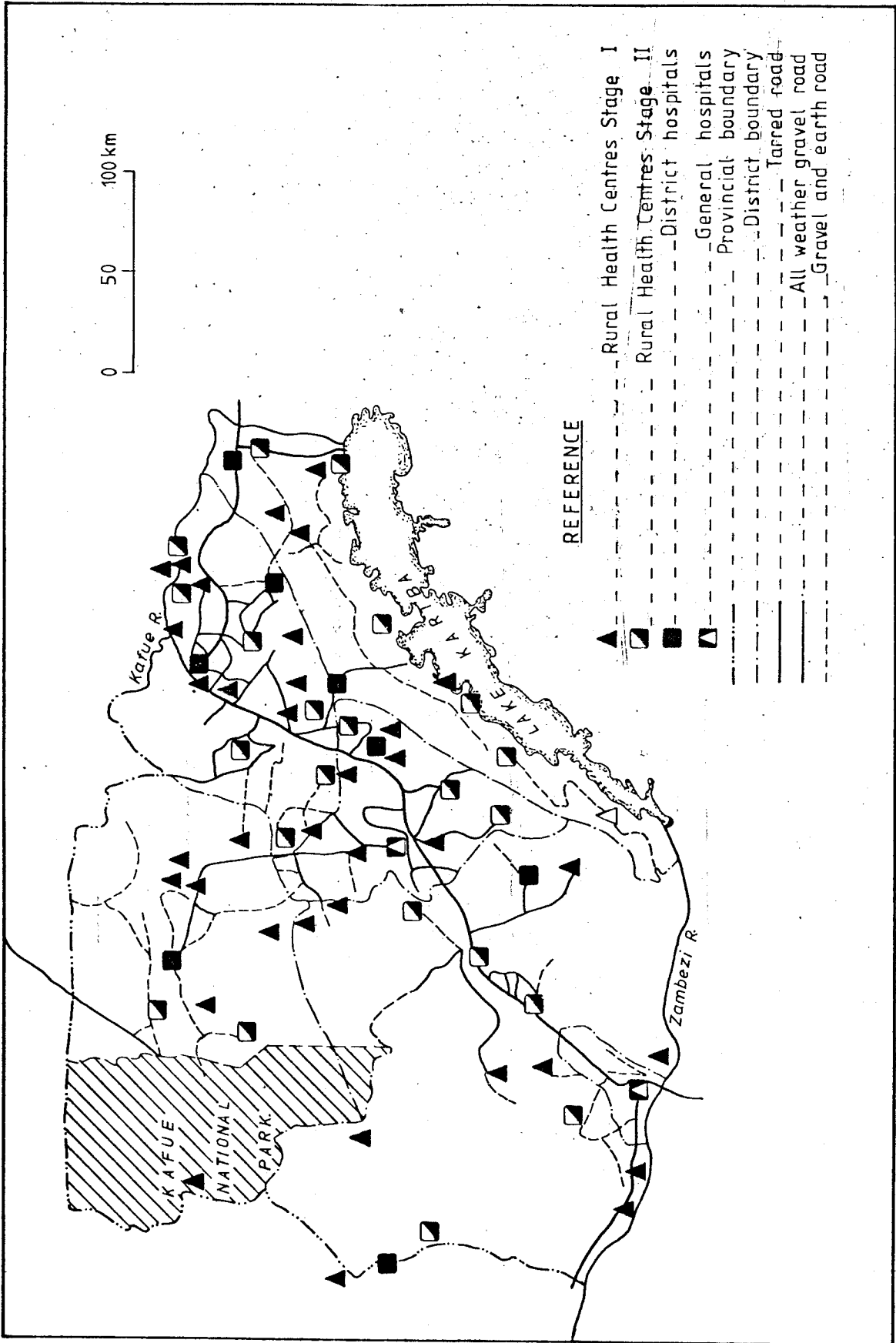


Fig.2.5: ROAD AND HEALTH INFRASTRUCTURE 1977 (Source: Elgie,1978)

- (i) Low population density (2-10 persons per square kilometre)
- (ii) Moderate population density (10-21 persons per square kilometre)
- (iii) High population density (above 21 persons per square kilometre)

Low population density

This covers most parts of the lower Zambezi, the southern, south-western, and north-western parts of the province. In the lower Zambezi, the main inhibiting factors to population settlement include tsetse flies carrying animal and human sleeping sickness, lack of infrastructure, water facilities, flooding, a generally humid environment, poor market facilities and generally, poor socio-economic opportunities. In the south-western and north-western part of the province, the main inhibiting factors to population settlement, include the Kafue and Lochinvar National Parks, The seasonally flooded Kafue flats, tsetse flies carrying animal and human sleeping sickness, poor soils, (the Barotse sands), inadequate rainfall, and poor road communication network.

Moderate population density

This covers areas in the north of Choma and Monze districts. The adjacent area to the eastern side of the line of rail in Choma and Monze districts,

and the area around Maamba. These are areas with good road communication network, good soils, adequate rainfall and good access to the market. In Maamba region population concentration occurs because of coal mining activities.¹³

High population density

This covers some areas adjacent to the areas of moderate population density and the major town centres. These are zones of development, characterized by relatively advanced farming with both livestock and crops, maize being the staple.¹⁴ Most of it forms part of the land alienated to the state with big commercial farms and settlement schemes. Flanking these are Native Reserves. These native reserves have some of the highest population concentrations due to the dispossession of land by the state originally for Europeans. Some of the people migrated there due to relatively better socio-economic opportunities (see Fig. 2.6).

2.01.7 Land use and agriculture

One of the colonial legacies that has become a constant source of worry to peasant farmers in Southern Province is land alienation. This alienated land is used for commercial farming by individuals, companies and the state, and comprises some of the best land in the province. Most of the alienated land is on the plateau in

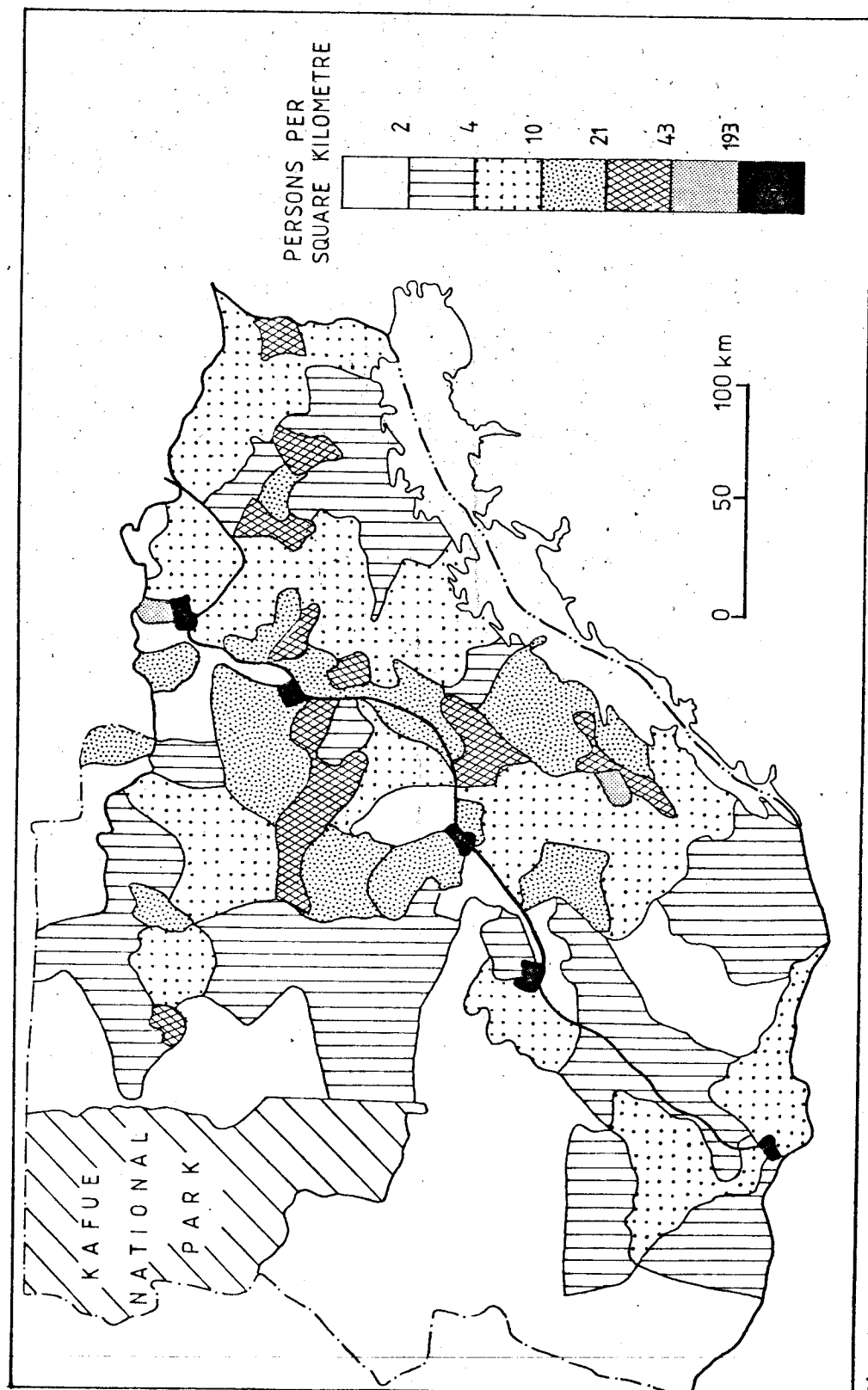


Fig. 2.6 : POPULATION DENSITY - 1969 (Source: Adika, 1977)

the districts of Kalomo, Choma, Monze and Mazabuka (see Table 2.1) and Fig. 2.7).

District	Rural resident Population 1969	Reserve and trust land ('000) ha	State land ('000) ha	Percenta of state land
Choma	83,670	475	205	30.1
Gwembe	76,451	892	0	0
Kalomo	71,783	1524	308	16.8
Livingstone	13,775	0	142	100
Mazabuka and Monze	64,119	285	175	38.1
Namwala	34,849	375	0	0

Table 2.1 Area of reserve, trust and stateland

Source: G.R.Z., 1969 Census of population.

Landuse

Out of the 8.3 million hectares of land in the Southern Province, there are approximately 1.3 million hectares which have been cleared for cultivation at one time or another. In any one year only about 0.25 million hectares, 20 per cent of all cleared land are cropped. There is an estimated 0.97 million hectares of good to medium agricultural land which have never been cleared.

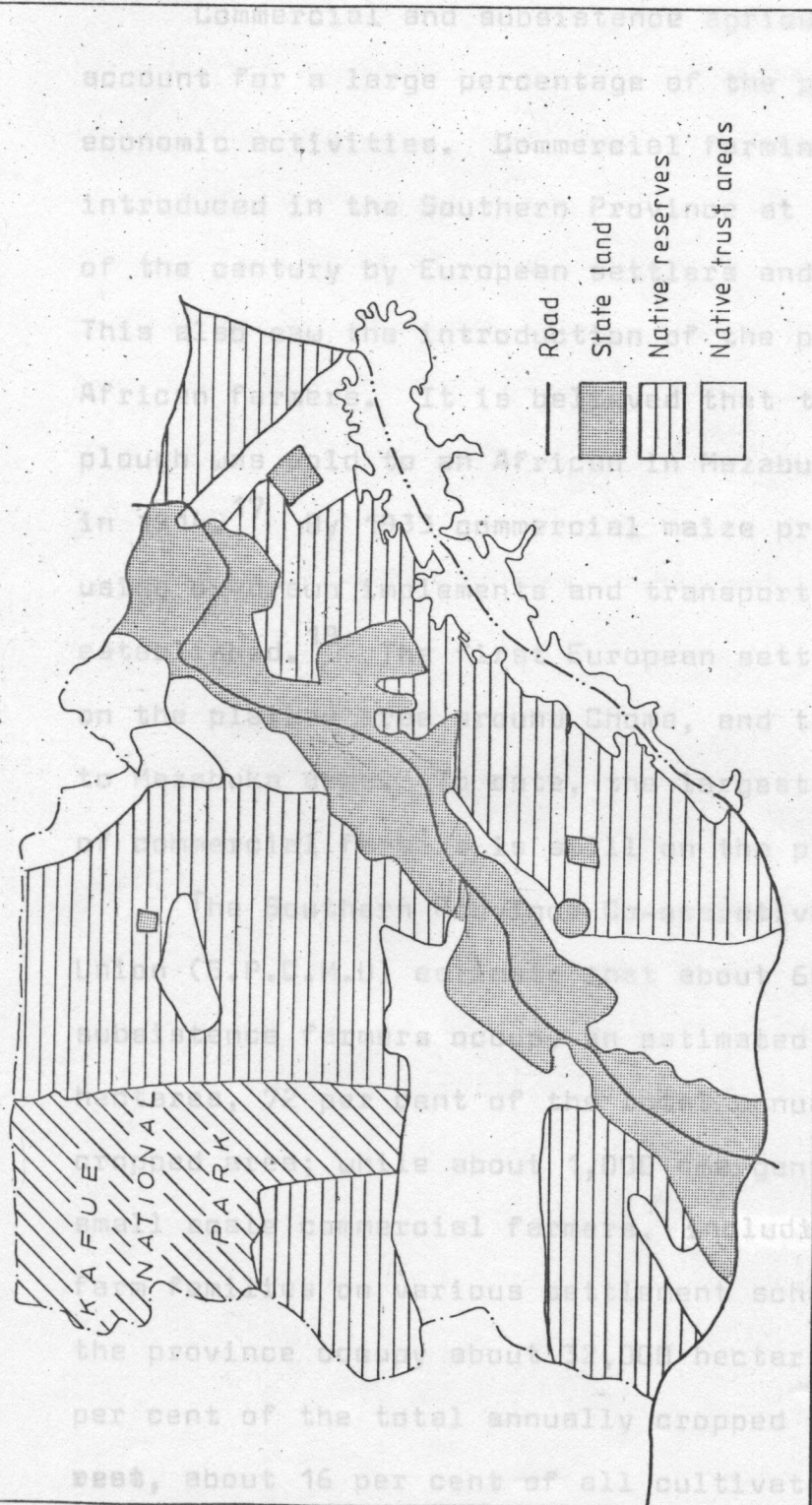


Fig. 2.7 : LAND ALIENATION (Source : Davies, 1971)

The estimated total area suitable for cultivation is about 2 million hectares, 27 per cent of the total land area.¹⁵

Agriculture

Commercial and subsistence agriculture account for a large percentage of the province's economic activities. Commercial farming was introduced in the Southern Province at the turn of the century by European settlers and missionaries.¹⁶ This also saw the introduction of the plough to African farmers. It is believed that the first plough was sold to an African in Mazabuka district in 1914.¹⁷ By 1933 commercial maize production using ox-drawn implements and transport was well established.¹⁸ The first European settlers were on the plateau area around Choma, and then spread to Mazabuka area. To date, the largest concentration of commercial farmers is still on the plateau.

The Southern Province Co-operative Marketing Union (S.P.C.M.U) estimate that about 65,000 subsistence farmers occupy an estimated 182,000 hectares, 72 per cent of the total annually cropped area; while about 1,000 emergent¹⁹ and small scale commercial farmers, including about 1500 farm families on various settlement schemes in the province occupy about 32,000 hectares, 12 per cent of the total annually cropped area. The rest, about 16 per cent of all cultivated land is

farmed by about 300 commercial farmers.²⁰

2.02 PATTERNS AND MAGNITUDE OF MIGRATION: 1963-69

2.02.1 Limitations of data

Most scholars of internal migration in Africa have been frustrated by the limitations of the census data available, or its complete absence and by the problems of carrying out a sufficiently large sample study to allow meaningful generalizations. However in Zambia it is relatively easy to make studies at the district level as data is available from the 1963 and 1969 census. Nonetheless, the data which is used here suffers from the following problems:

- (i) it is not in small area units, and hence hides local variations,
- (ii) it does not have any information on the determinants of migration, e.g. motives for migrating, nor on the characteristics of the migrants and non-migrants
- (iii) a further problem given the focus of this study is that as with most census data, this information does not allow examination of the consequences of migration both on the origin and destination and on the individual migrant and non-migrant. Hence the amount of analysis made of the data will be limited by the available information.

2.02.2 Magnitude of intra-rural migration

In trying to examine the pattern of intra-rural migration in Southern Province using the 1969 census data, five regions can be identified;

- (i) regions of high net in-migration
- (ii) regions of medium net in-migration
- (iii) regions of low net in-migration
- (iv) regions of high net out-migration
- (v) regions of low net out-migration

(see Fig. 2.8)

An examination of migration data in the six districts of the Southern Province shows that positive net migration rates were recorded in the following districts:

- (i) Livingstone rural + 150.6 (per thousand)
- (ii) Namwala + 46.5 " "
- (iii) Mazabuka + 42.1 " "
- (iv) Kalomo + 16.7 " "

while negative net migration rates were recorded in the following districts:

- (i) Gwember - 90.4 (per thousand)
- (ii) Choma - 15.1 (see Table 2.2)

District	Rural Population mid intercensal period (1963-69)	M I G R A N T S			Rate of Migration per 000'
		IN	OUT	NET	
Choma	80,170	6426	7635	-1209	-151
Gwembe	72,732	1650	8263	-6613	- 90.4

District	Rural population mid intercensal period (1963-69)	M I G R A N T S			Rate of Migration per 000'
		IN	OUT	NET	
Kalomo	69,283	6592	5435	1157	+ 16.7
Livingstone	12,775	2497	584	1913	+150.6
Mazabuka	62,119	7323	4709	2614	+ 42.1
Namwala	34,687	3625	2011	1614	+ 46.5

Table 2.2: Intra-rural migration by district, Southern Province Zambia, 1969.

Source: G.R.Z. 1969 Census of population

In order to have a better appreciation of the variations and intensity of intra-rural migration amongst the six districts, an examination of turn over rates is made.²¹ This rate seeks to measure the number of moves in and out of a given area in relation to the population of that area. It is calculated by the formula:

$$\frac{M_i + M_o \times 1000}{P}$$

where M_i and M_o denote the number of in and out-migrants for a given area in relation to all other areas, while P refers to the total population of the area at the time.

According to this index, the following order of magnitude was recorded:

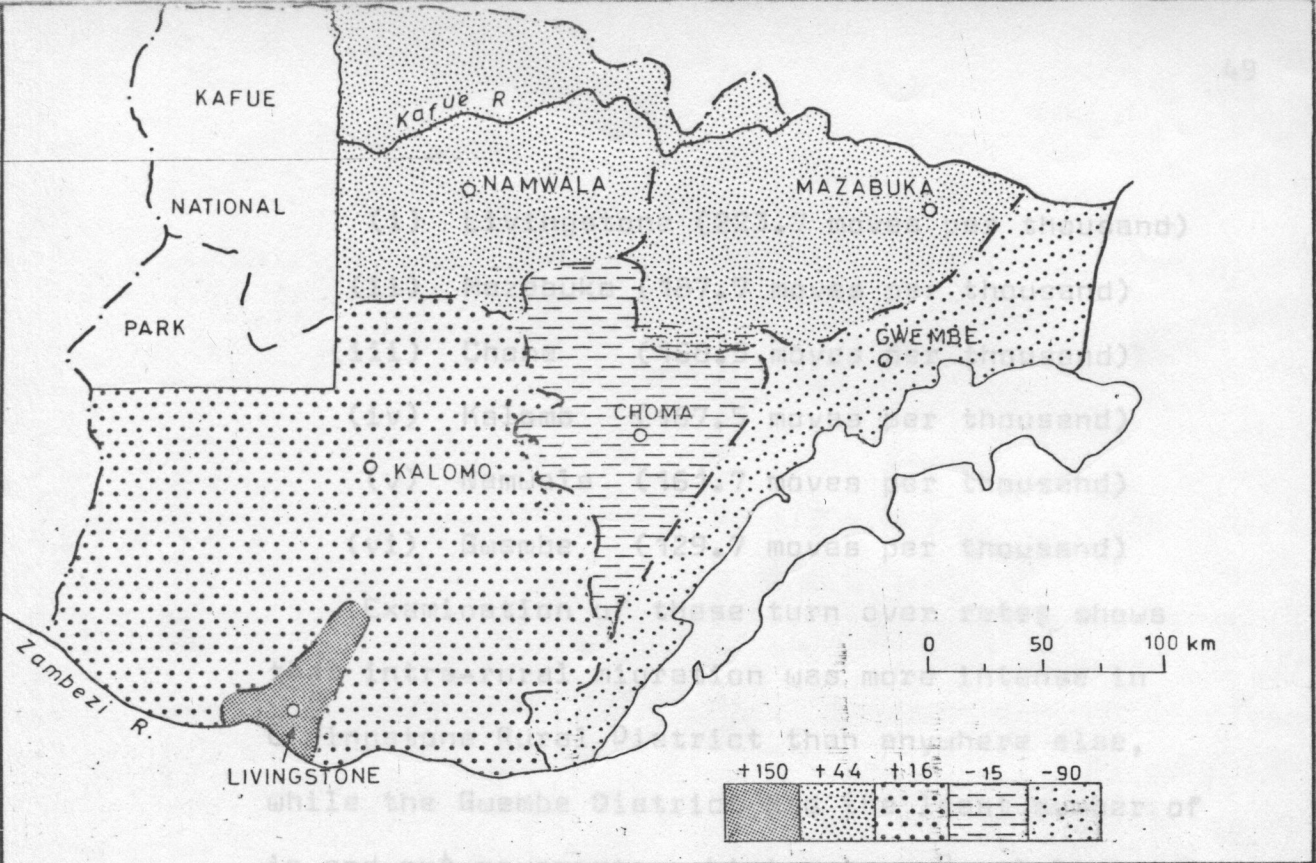


Fig.2.8 : RATES OF IN AND OUT-MIGRATION 1963-69 (Source: G.R.Z,1969)

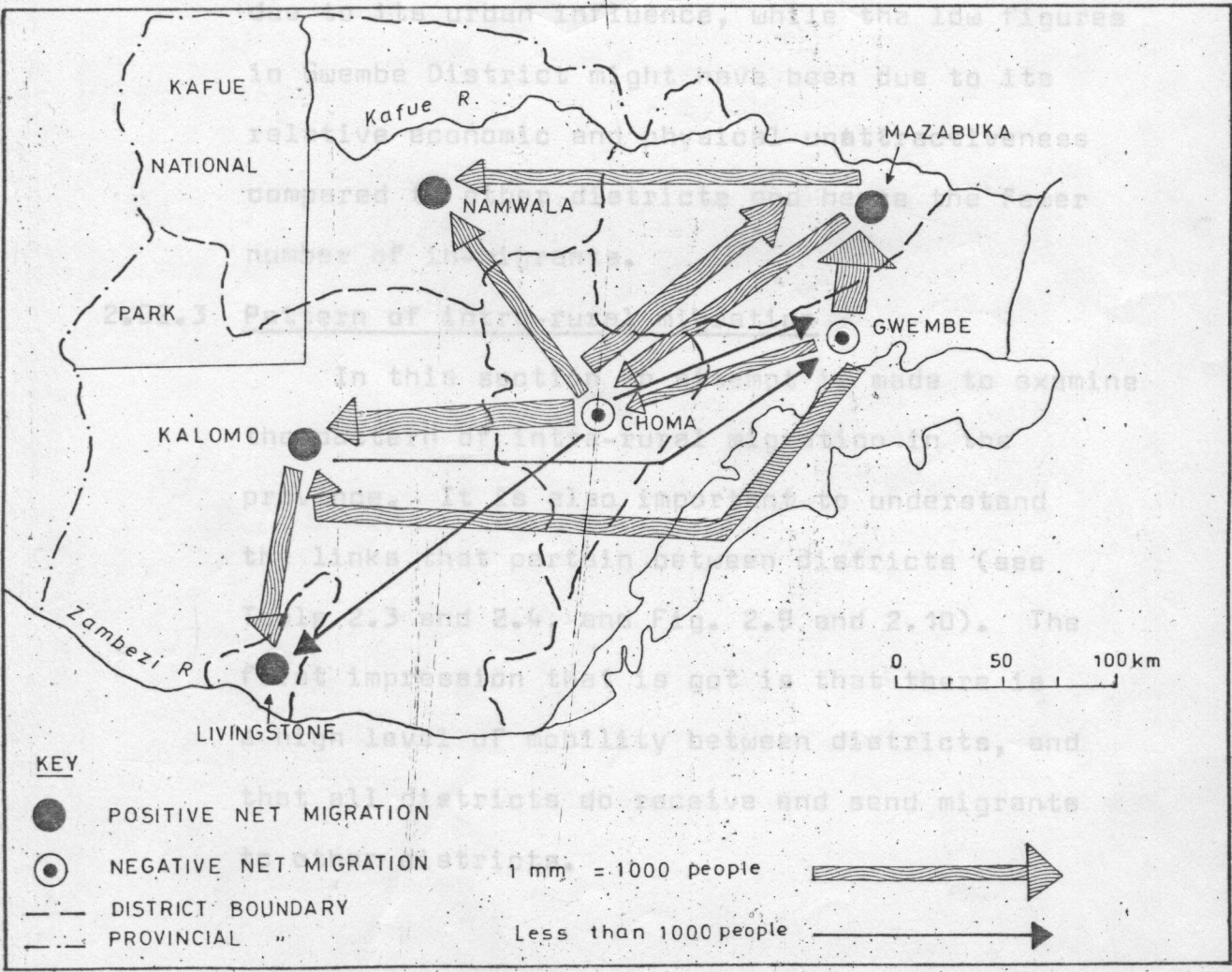


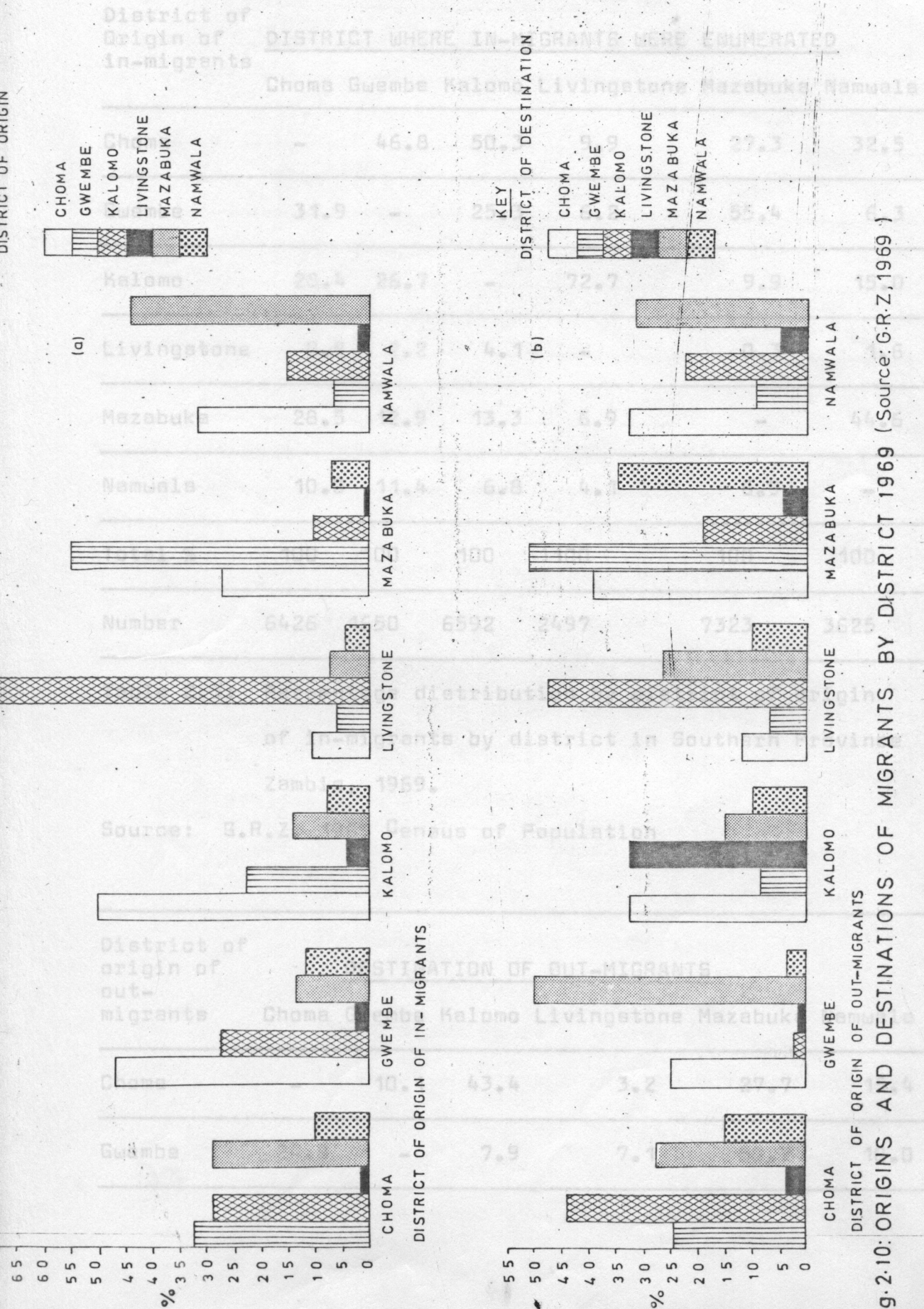
Fig. 2.9 PATTERN AND MAGNITUDE OF INTER-DISTRICT MIGRATION 1963- 69 (Source: G.R.Z, 1969)

- (i) Livingstone (223.7 moves per thousand)
- (ii) Mazabuka (187.7 moves per thousand)
- (iii) Choma (168.5 moves per thousand)
- (iv) Kalomo (167.5 moves per thousand)
- (v) Namwala (161.7 moves per thousand)
- (vi) Gwembe (129.7 moves per thousand)

Examination of these turn over rates shows that intra-rural migration was more intense in Livingstone Rural District than anywhere else, while the Gwembe District had the least number of in-and out-movements. Livingstone Rural District might have experienced the highest turnover rate due to its urban influence, while the low figures in Gwembe District might have been due to its relative economic and physical unattractiveness compared to other districts and hence the fewer number of in-migrants.

2.02.3 Pattern of intra-rural migration

In this section an attempt is made to examine the pattern of intra-rural migration in the province. It is also important to understand the links that pertain between districts (see Table 2.3 and 2.4, and Fig. 2.9 and 2.10). The first impression that is got is that there is a high level of mobility between districts, and that all districts do receive and send migrants to other districts.



District of Origin of in-migrants	<u>DISTRICT WHERE IN-MIGRANTS WERE ENUMERATED</u>					
	Choma	Gwembe	Kalomo	Livingstone	Mazabuka	Namwala
Choma	-	46.8	50.3	9.9	27.3	32.5
Gwembe	31.9	-	25.3	6.2	55.4	6.3
Kalomo	28.4	26.7	-	72.7	9.9	15.0
Livingstone	0.9	2.2	4.1	-	0.3	1.6
Mazabuka	28.5	12.9	13.3	6.9	-	44.6
Namwala	10.0	11.4	6.8	4.1	6.9	-
Total %	100	100	100	1100	100	100
Number	6426	1650	6592	2497	7323	3625

Table 2.3: Percentage distribution by district of origin
of in-migrants by district in Southern Province
Zambia, 1969.

Source: G.R.Z. 1969 Census of Population

District of origin of out- migrants	<u>DESTINATION OF OUT-MIGRANTS</u>					
	Choma	Gwembe	Kalomo	Livingstone	Mazabuka	Namwala
Choma	-	10.1	43.4	3.2	27.7	15.4
Gwembe	24.8	-	7.9	7.1	50.2	10.0

District of origin of out- migrants	<u>DESTINATION OF OUT-MIGRANTS</u>					
	Choma	Gwembe	Kalomo	Livingstone	Mazabuka	Namwala
Kalomo	33.5	8.1	-	33.4	14.8	10.0
Livingstone	10.9	6.3	46.9	-	25.8	9.9
Mazabuka	38.9	4.5	18.6	3.6	-	34.2
Namwala	32.2	9.2	22.3	5.1	31.0	-
Total %	100	100	100	100	100	100
Number	7635	8263	5435	584	4709	2011

Table 2.4: Percentage distribution by the district of destination of out-migrants by district, Southern Province, Zambia 1969.

Source: G.R.Z. 1969 Census of Population.

From the tables above, the following conclusions can be drawn about the pattern of intra-rural migration in the province.

- (i) Choma and Gwembe rural districts are regions of high net out-migration to Kalomo and Mazabuka districts respectively. (And at a micro-level, Chief Moyo in Choma rural district is a source of migrants to Chief Chikanta in Kalomo rural district)
- (ii) Kalomo and Mazabuka districts are a source of out-migrants to Livingstone and Namwala rural districts respectively

- (iii) Namwala and Livingstone rural districts
are not major regions of out-migration.

2.02.4 Sub-District variations in growth of population between 1963-1969

In analysing sub-district variations in the growth of population in Southern Province three regions can be identified, but with a number of exceptions (see Fig. 11).

- (i) a north-south central belt of net population loss
- (ii) a north-south east of the rail line and south-west belt of low population growth and
- (iii) a north-west belt of high population growth.

The central belt of net out-migration comprises the plateau districts of Mazabuka, Monze and Choma. This central belt of net out-migration has experienced a continued decline in population growth as a result of out-migration to urban areas within and outside the province, agricultural settlements in Namwala and Numbwa districts and certain parts of Kalomo District like Chiefs Chikanta, Momba, and Siachitema. The plateau districts include large areas of alienated state-land, most of which is used for commercial farming by individuals, companies and the state. This has caused a considerable shortage of land amongst

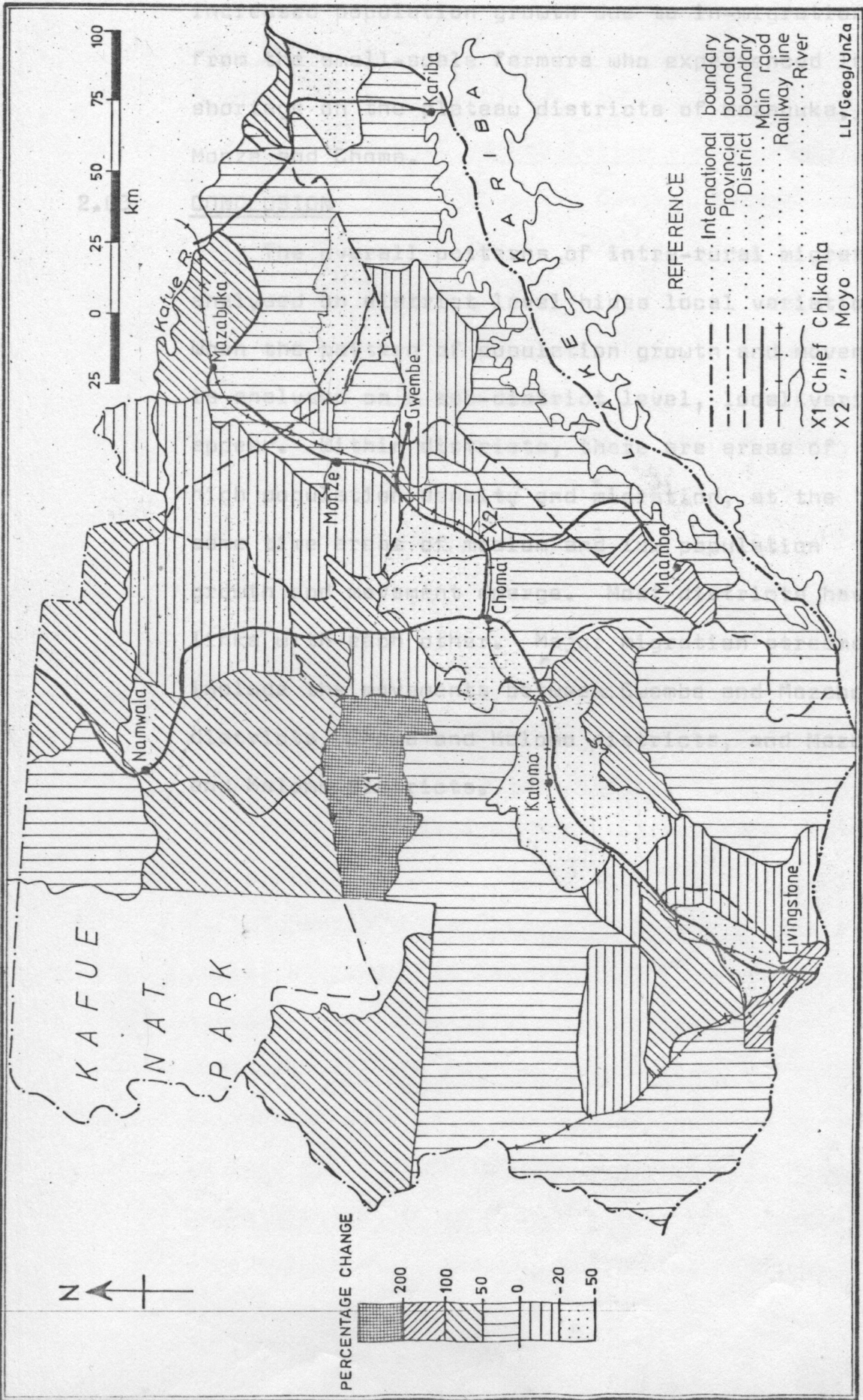


Fig.2.11 : POPULATION GROWTH 1963 - 69 (Source: Adika 1977)

District mentioned earlier on. This region enjoyed increased population growth due to in-migration from the small-scale farmers who experienced land shortage on the plateau districts of Mazabuka, Monze and Choma.

2.03 CONCLUSION

The overall patterns of intra-rural migration analysed on district level hides local variations. When the pattern of population growth and movement is analysed on a sub-district level, local variations appear. Within districts, there are areas of high population density and migration, at the same time areas of medium and low population growth and movement emerge. Most districts have links with each other. Major migration streams include the movements between Gwembe and Mazabuka districts, Choma and Kalomo districts, and Mazabuka and Kalomo districts.

CHAPTER 2: FOOTNOTE REFERENCES

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12. S.P.C.M.U., 'Cooperative Credit Scheme', 2.
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CHAPTER 3

THE STUDY AREAS

3.01 INTRODUCTION

The last chapter analysed migration patterns in Southern Province in a general way. In this chapter the phenomenon of migration is examined at the micro level, and hence in greater detail in two sample areas. It was not possible at a macro level to make an objective analysis of the causes of migration nor to assess the impact of migration upon the source areas and destinations. The next two chapters pay particular attention to these topics within the sample areas.

3.02 SOURCE AREA: CHIEF MOYO'S AREA

3.02.1 The Physical environment and its use

The area is hilly with the highest points being above 1,310 metres, while the lowest are at 1,102 metres above sea level. There are numerous streams and river valleys. Some of these river valleys are fertile, while the others are waterlogged for a good part of the year. Most hill-tops are devoid of the top soil as a result of deforestation, overgrazing and soil erosion. The soils are part of the sandveldt group. They are loamy sands or sand, rather coarse grained, the clay content usually increasing with depth, yellowish-red to light yellowish-brown where well drained and grey brown where poorly drained.¹

Approximately, fifty per cent of the land is suitable and available for agriculture while the remainder is not. Vegetation patterns in the area belong to the escarpment miombo woodland.²

Land use patterns closely relate to the nature of the terrain. During the wet season, the hilltops provide the pastureland, but in the dry season are only used as sources of firewood. Valley margins and in certain extreme cases, hillslopes are used for gardens in which maize, sunflower, sweet potatoes, beans and groundnuts are grown. During the dry season these are used as grazing areas as the cattle graze on the maize stalks. Grazing land is communally owned except for maize fields which remain individually used until the maize stalks are eaten. Valley centres with wet soils throughout the year provide dry season pasture land. The edges of the streams and rivers are used for vegetable gardening.

Land resources belong to the Chief who delegates the power of allocation to village headmen. Although land is communally owned, individuals retain some family rights to the land. Land may be passed on from grandfather to grandchildren without the personal authority of the Chief or headman. Over the last twenty years, there has been a change in the amount of land owned and cultivated. The sample³ interviews

revealed that, between 1960-1975, the average areas available for cultivation by each peasant farmer was 5.6 hectares, while in the same period, the average number of hectares planted per farmer was 2.2 hectares. However during 1975-82, the respective figures were 7.5 and 3.2 hectares (see Table 3.1). Increased land clearance and out-migration with associated abandonment of land to relatives contributed to this change.

	Land Owned (ha)		Land cultivated (ha)	
	0-8	8+	0-2.2	2.2+
Early 1960's	76.6	23.3	53.3	46.6
Late 1970's	56.6	43.3	46.6	53.3

Table 3.1: Amount of land owned and cultivated in Chief Moyo: 1960-1980⁴

The nature of the environment provides some problems. These include:

- (i) A relative shortage of land for cultivation and grazing because the valley bottoms are too wet while the hill tops are too eroded and sandy.
- (ii) The stony nature of the soil does not allow winter ploughing and as a result timely sowing, which may produce quick germination and higher yields, is not done.

- (iii) Gully and sheet erosion wash away the fertilizers applied.
- (iv) The lifespan of the farming equipment is affected by the stony soil.
- (v) The hilly nature of the area reduces accessibility to markets for perishable commodities such as vegetables, and to maize depots.
- (vi) The area has no adequate government services such as health centres and annual grading of feeder roads to the depots.

3.02.2 Economic development

The economic development of Chief Moyo's area is strongly tied to the development of agriculture. Before the introduction of the plough at the turn of this century, the hoe had been the only equipment used for farming. European farmers and missionaries introduced the plough to the area.⁵ Except for the area close to the line of rail, the area has never been affected by European land alienation.

The importance of agriculture in the rural economy of the area cannot be over emphasized. Most people in the area are dependent on income realized at the end of every growing season from **five** major crops, maize, sunflower groundnuts **cotton and tobacco.** Diversification of the rural economy is slowly taking place, the farmers have started growing beans on a commercial basis while vegetable and

fruit gardening is also entering the commercial circle. Fruits such as bananas and oranges do very well and are sold along the line of rail. Baskets, stools, hoes, water buckets, axes and scotch-carts are made and have become an important source of money. Poultry, cattle, goats and pigs are sold in times of need. Beer brewing is a common source of money which many households utilise.

The farming community can be divided into three groups.⁶ Upstarters, improved upstarters, and "semi" emergent farmers. The subdivision is done according to implements used and method of farming. Out of a total of 250 peasant farmers in the sample area studied, there are 100 upstarters, 125 improved upstarters, and 25 "semi" emergent.

The basic characteristic of the upstarters is the need to hire oxen, plough, discharrows and cultivators. They cultivate on average 1.2 hectares per household. The use of improved seeds and fertilizer is minimal and production is low, sometimes insufficient for household subsistence, yields of maize average 15 bags/hectare.

Improved upstarters is the largest category of farmers in the area. These farmers practice some traditional and some modern methods of farming. They cultivate between 2 to 4 hectares

for all crops in any one year depending on the available household work force. They use improved seeds and some chemical fertilizer. Although their crop yields are lower than optimum they produce more than enough for household consumption and are therefore able to sell surplus production. Yields of maize are about 30 bags/hectare.

The "Semi" Emergent group comprises the most advanced farmers in the area. Basic necessary equipment for commercial farming is found in the hands of most of the farmers in this category, e.g. tractors. They cultivate an average of 9 hectare. They all use improved seeds and large amounts of chemical fertilizer and pesticides. Crop yields are high and the contribution from this category of farmers to marketed farm produce is correspondingly high. Maize yields are as high as 50 to 55 bags/hectare.

Much of the improvement in agriculture is of a recent nature. During the period just before independence there were not more than 20 per cent of the people who produced for the market. Low prices, lack of credit and poor extension facilities contributed to this.

Rapid increase in maize production occurred in the mid seventies. From a mere average of

of 43.4 bags of maize per farmer in the sixties, the average rose to 95.7 bags in the seventies.⁷

The increase in production is reported to have been a result of increased and improved credit and extension facilities, fertilizer and seed subsidies, and price incentives.⁸ This rapid increase in crop production was followed by a slump of nearly fifty per cent towards the end of the seventies. This may be attributed to bad weather in 1978 and 1979, late arrival of chemical fertilizer, the non-availability of loans and continued out-migration of good farmers (see Fig. 3.1.) The only exception to this was sunflower which continued to rise even when the production of maize was falling. This may be attributed to the increase in the number of people who are growing it compared to the past, and its resistance to poorly distributed rainfall.

✕ Despite overall increase in production in the early seventies, major constraints still exist in the area which hinder full development of agriculture. Land shortage is widespread. The population density of arable land was 2 hectares per person in 1969. In some parts of the area there is an acute shortage of farming equipment though in general there is adequate farming equipment. Hiring and borrowing of farming equipment means that those hiring and borrowing are unlikely to use them to their

CHIEF MOYO

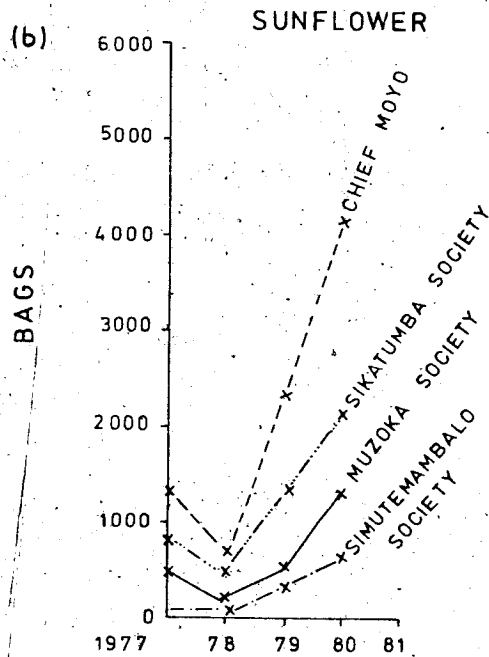
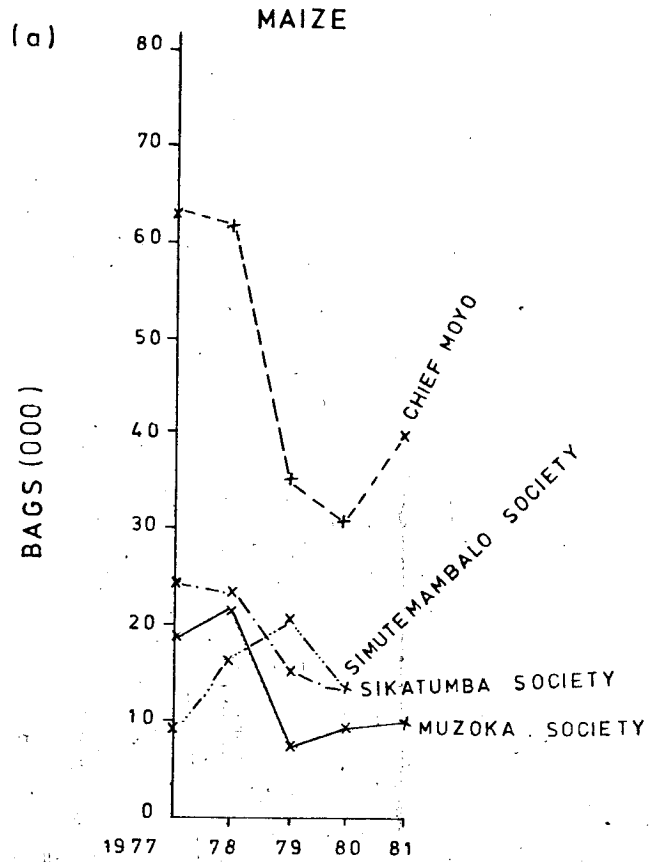


Fig. 3.1: PRODUCTION OF MAIZE AND SUNFLOWER
(Source: S.P.C.M.U, 1982)

full capacity; partly because by the time they borrow them they would be late for timely sowing and other related activities, also because of subsequent seasonal peaks in labour demands for operations carried out by hand like weeding and harvesting although family labour is generally adequate for the operations. (see Table 3.2)

<u>Equipment owned</u>	<u>%</u>	<u>Equipment owned</u>	<u>%</u>
Tractor	0	Ox-plough	93.3
Cultivator	83.3	Disc-harrow	80.0
Scotch-cart	53.3	Trained oxen	96.6
Cattle	93.3	Handmill	53.3

Table 3.2 Percentage distribution of farming equipment.

3.02.3 Migration

Early out-migration from Chief Moyo's area dates back to the labour migrations in the colonial era to South Africa and the Copperbelt Province. At independence, the sudden expansion in urban employment opportunities, for both primary and junior secondary school drop outs encouraged rural-urban movement within and outside the province.

Falling copper prices, resulted in an economic slump in the mid seventies. This in turn meant a cut in employment opportunities for school drop outs. This deterred rural-urban migration and increased pressure on land resources.

These negative socio-economic factors did not stop migration, but changed its pattern. By the mid seventies, migration within and outside the province to agricultural frontiers in northern Choma, Kalomo, Namwala and Mumbwa districts, grew, replacing out-migration to urban areas as the major type of movement. Though out-migration was widespread to most of the agricultural frontiers, Chikanta in Kalomo District received most of the migrants from Chief Moyo.

The survey conducted revealed that land was the major factor in the decision to migrate to Chikanta. Other reasons were given too but these generally related to the land situation (see Table 3.3).

Cause of Out-migration	%
Shortage and poor quality of land	56.0
Poor economic opportunities	14.0
Poor agricultural opportunities	10.0
Social problems	20.0

Table 3.3 Reasons given by non-migrants for migrants leaving Chief Moyo's area.

Migrants from Chief Moyo can be stratified according to the divisions of farming groups in the area. According to this, 33 per cent were in group one, 33.67 per cent in group two, and 33.33 per cent in group three. This shows a stronger tendency for "semi-emergent" farmers rather than the other groups to migrate.

3.03 DESTINATION: CHIEF CHIKANTA

3.03.1 The physical environment and its use

The area has a gently rolling terrain compared to Chief Moyo. The highest points lie at 1,200 metres, while the lowest points lie at 1,140 metres/a.s.l. Much of the area is covered with miombo-woodland, hyparrhenia grassland and Kalahari woodland.⁹ The soils are of the Barotse sand group. They are deep, loose, wind and water sorted sands, very low in clay and silt content throughout their depth.¹⁰ Approximately, eighty per cent of the land is suitable and available for agriculture.

Three types of landuse patterns can be identified; cultivation, grazing and wood collection. There is plenty of land for all land uses except that there is a shortage of dambos for grazing purposes. Most of the grazing land is communal but there have been attempts at fencing off some of the grazing land. Vegetable gardening is not common in this area.

Land resources belong to the village headman who acts on behalf of the Chief. The village headman distributes land to the new arrivals in the area. No fixed amounts of landholdings are given. Land is given to heads of households who make further subdivision to their followers and dependants. The two years (1980-1982) have seen a decline in size of landholdings given to

each migrant because of the intensification of in-migration. The field survey revealed that between 1975-1980, the average number of hectares owned per migrant was 31.2 hectares, while in the same period the average number of hectares planted per migrant was 6 hectares per household. (see Table 3.4)

Land owned (ha)		Land cultivated (ha)	
0 - 8	8+	0 - 2.2	2.2+
10 .0	90.0	15.0	85.0

Table 3.4 Amount of land owned and cultivated by migrants at the destination.

The land/man ratio in Chief Chikanta is higher than the land/man ratio in Chief Moyo. Fifty-six per cent of the people in Chief Moyo own between zero and eight hectares, while forty-four per cent own over eight hectares, while in Chief Chikanta it is ten per cent and ninety per cent respectively. Average cropped land shows a similar pattern to that of ownership of land. It is on average higher in Chief Chikanta than in Chief Moyo. In Chief Moyo, 46.6 per cent plant between 0-2.2 hectares, and 53.3 per cent plant over 2.2 hectares while in Chief Chikanta it is 15 per cent and 85 per cent respectively. There are a number of problems in the area that hinder full development of the area;

- (1) Because of the sandy nature of the soils, both domestic and wild animals break the soil. This causes wind erosion.
- (2) Shortage of water for both animals and human beings is common during the dry season. This has health implications, and is time wasting.
- (3) Human and animal sleeping sickness is quite widespread in the area, limiting animal husbandry.
- (4) There is lack of adequate government services such as roads, schools and health centres.

3.03.2 Economic development

Till the late sixties, the southern and south-western part of Chief Chikanta were bush and the most part of it, a game management area. There was widespread human and animal sleeping sickness which hindered early settlement and development of agriculture and animal husbandry. A government sponsored programme to spray the area in the mid-seventies brought about change. This facilitated rapid and widespread human settlement and economic development. Settlers acquired large tracks of land which they cleared and cultivated. This pushed the boundary of the tsetse infested area further into the game management area and encouraged further settlement and in-migration.

The rural economy of the recently settled area does not vary considerably from that of the

whole of Chief Chikanta's area. Agriculture plays a major role. Major crops include maize, sunflower and groundnuts, but cotton, sorghum and millet are also grown though not to the same extent as the other three. This area contrasts with Chief Moyo in that tobacco and cotton are not major crops as in Chief Moyo. Cattle sales to the Cold Storage Board of Zambia and private butchers on the Copperbelt Province play a leading role as a source of income. This business is prolific during the off farming season when the oxen are not in use and also during the December - January season when schools open and people are looking for money to finance their children's schooling. Other sources of income include beer brewing and poultry sales. The transportation business is equally profitable given the poor provision of transport in the area by the government.

Three same categories of farmers can be identified in the area as in Chief Moyo. Their characteristics are as in Chief Moyo for each group.¹¹

* Chief Chikanta has a good history of agricultural development. This might be attributed to the abundance of land. Recent developments in agriculture have seen the increase in the number of improved farmers. Production of maize

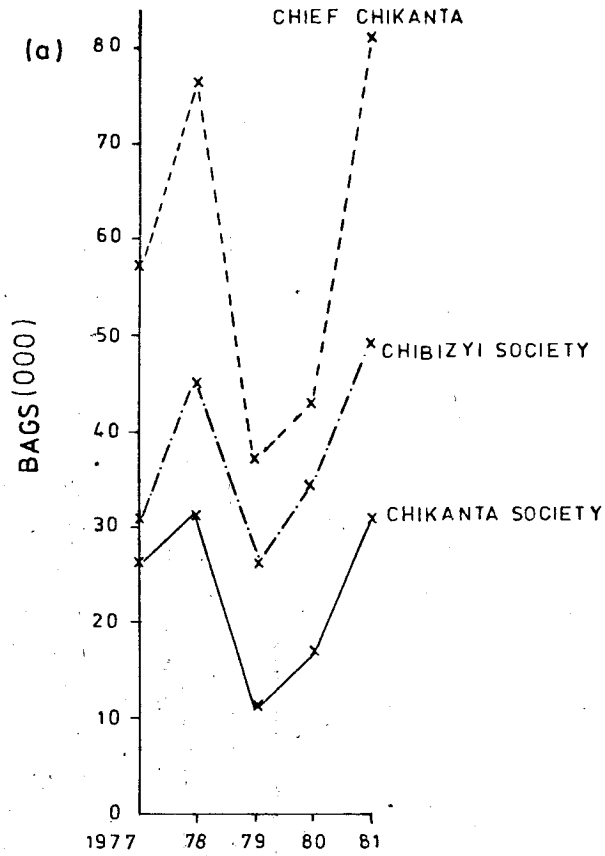
is generally quite high. Average production of maize for the last five years 1977-1981 was above 60,000 bags. Production of sunflower over the same period was above 4,000 bags (see Fig 3.2).

The fundamental problem in the development of agriculture in the area is the poor transport infrastructure in the area. Most routes are only passable during the dry season. The shortest routes to the area from Choma via Macha has got wooden bridges; as such heavy duty trucks cannot pass. The alternative route i.e. Choma-Mapanza-Muchila-Chikanta is longer by 140 kilometers. These communication problems in many instances have led to the non availability of agriculture inputs such as fertilizer and hybrid seed.

3.03.3 Migration

Although rapid and widespread migration into southern and south-western Chikanta dates back only to the early 1970's the slow infiltration of people into the area goes back into the early 1960's. Evidence to support this comes from two sources; the different types of people found there, e.g. the Ndebele and the Shona who came from Southern Rhodesia around the 1960's and the 1969 census which shows Chief Chikanta as the only rural area in Southern Province which had a population increase of above

CHIEF CHIKANTA MAIZE



SUNFLOWER

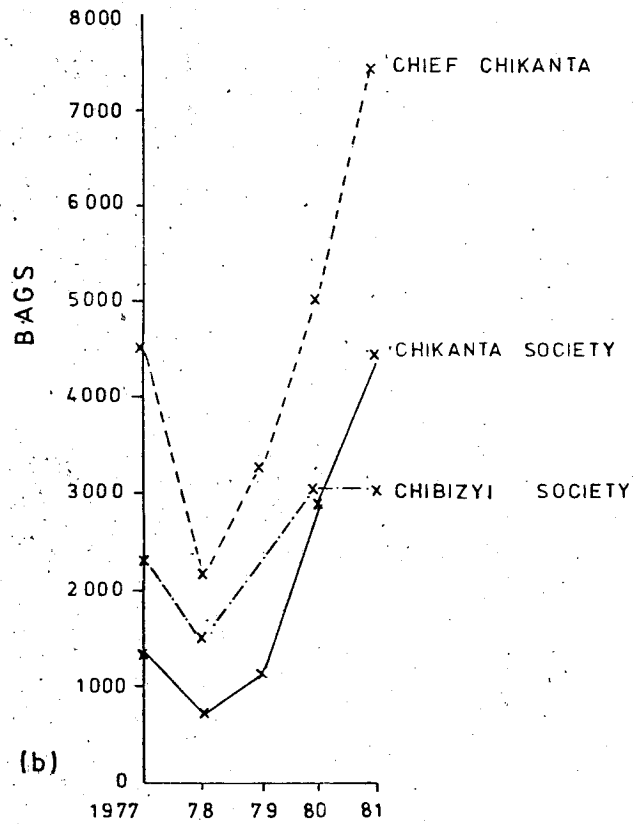


Fig.3.2: PRODUCTION OF MAIZE AND SUNFLOWER (Source: S.P.C.M.U,1982)

200 per cent, the national average being 2.5 per cent (refer back to Fig.2.11).¹² Migration into the area continues as land is still available for farming. Most of the in-migrants are from the plateau districts of Monze, Choma and Mazabuka, where the shortage of farming land is critical.

Rapid out-migration from Chief Moyo to Chief Chikanta started around the mid seventies. All the thirty migrants interviewed in the area indicated that they migrated into the area between 1975 and 1981. One of the reasons for this sudden influx of people from Chief Moyo was lack of information on the land opportunities that existed prior to the mid seventies, and a critical shortage of land around these years when more people turned to farming as urban jobs became difficult to obtain.

The reasons given by the migrants for migrating are almost similar to those given by the non-migrants in Chief Moyo. The following are the main reasons given for migrating (see Table 3.5).

Cause of out-migration	%
Shortage of land	60.0
Poor quality of land	10.0
Followed guardians	20.0
Social problems	10.0

Table 3.5 Reasons given by migrants for leaving Chief Moyo's area.

3.04.4 Conclusion

The socio-economic environments of the two study areas do contrast to a certain extent. The contrast is big when the two physical environments are compared. While in the source area the physical environment is hilly with limited agriculture and marketing opportunities and limited accessibility, in the destination the physical environment is gently rolling and provides some avenues for agriculture and marketing though it lacks government services such as good transport networks, schools, health centres extension and credit facilities. It is the contrast in the physical environment which is the cause for the widespread in-migration that has been going on in Chief Chikanta by people from Chief Moyo for sometime now. In Chief Chikanta land is easy to get while in Chief Moyo it is not. In the next chapter we examine what effects this type of migration has had on the resource development of the two areas, the source and the destination.

CHAPTER 3 FOOTNOTES & REFERENCES

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Provincial Handbook, Series, No. 4 (August, 1978),
55.
3. The method of sampling is given in appendix A.
4. Unless where stated all tables are from the
field survey carried out in Muzoka Society
(Chief Moyo) and Chibizyi Society (Chief Chikanta)
between January and April 1982. Further details
on the methodology can be found in appendix
A. Note that all tables are given in per-
centages.
5. W.F. Bruce-Miller, 'Historical aspects of farming
in Southern Province,' Zambia Geographical
Association Magazine No. 28 (October, 1974), 3.
6. This subdivision was supplied by the extension
department Ministry of Agriculture and Water
Development, Ndondi Agricultural Camp, Chief Moyo.
7. The average was calculated over two ten year
periods i.e. from 1960-1970 and from 1970-1980
by using information supplied by the respondents.

8. This information is based on interviews held with several farmers in the area. Note that it is not on tape.
9. Huckabay, 'The vegetation of Southern Province,' 55.
10. G.R.Z. Soil Map.
11. Though no figures are available at the moment, it should be pointed out that the proportion of "semi-emergent" farmers to the rest of the farming community in Chief Chikanta is higher than that to be found in Chief Moyo's area.
12. G.H. Adika (Editor), Atlas of the Population of Zambia (Lusaka: National Council for Scientific Research, 1977).

CHAPTER 4

THE IMPACT OF MIGRATION ON RESOURCE DEVELOPMENT

4.01 INTRODUCTION

In Chapter One the relationship between migration and resource development was discussed. It was pointed out that the nature of this relationship is variable and that three different influences of migration could be seen upon regional inequalities, with

- (a) migration narrowing regional per capita income inequality
- (b) migration widening regional per capita income inequality and
- (c) the impact of migration on regional per capita income inequality being indeterminate.

The nature of this relationship depends upon the characteristics of the migrants and the consequent redistribution of people with specific characteristics, as well as upon the changes in these characteristics as a result of migration. It may also be influenced by the conditions in the two areas and in particular by crucial constraints upon resource development such as land, labour and capital resources. Through migration therefore, changes in the combination of factors of production may be achieved. This in turn may lead to a better population distribution relative to available resources such as land.

In this case better man-land ratios may be achieved which allow increased production and yield. In this chapter, an attempt is made using field data to examine the impact which migration has had on the resource use as reflected in agricultural production in the two sample study areas.

Production trends will be examined in order to assess resource use and changes in this due to migration. This analysis will be made at two levels, (a) society level,¹ (b) sample areas within the two societies. Two societies are picked for this purpose, Muzoka Society (Chief Moyo) and Chibizyi Society (Chief Chikanta). These two societies are chosen because they are the main areas from which and to which migrants in the study areas have travelled. At society level three products are examined, maize, sunflower and groundnuts, while approximate trends in the number for these societies of cattle are derived from Chief's areas data. Production figures of the three crops will be for only marketed produce. Figures for all products during the period 1977-1981 were sought for comparison but it has not been possible to obtain complete data in all cases. At the sample level within the two societies, only the production of marketed maize will be

examined. This is the major crop and the one for which data is felt to be most accurate. Within each of the two societies thirty heads of households were interviewed. This represented about 0.3 per cent of the total population in the source area and about 3 per cent of the total population in the destination. The households were picked purposively to represent all categories of the population, i.e. subsistence and emergent farmers.

4.02

AGRICULTURAL PRODUCTION TRENDS IN SOCIETIES

Maize

The production of maize between 1977 and 1981 has fluctuated in both societies from year to year though at different levels. Generally Chibizyi Society has achieved higher production levels than Muzoka Society. The average production for Chibizyi Society was 37,386 bags within this five year period, while for Muzoka Society it was 13,276 bags. Average production per society member was 84.4 bags for Chibizyi Society and 24.3 bags for Muzoka Society. Production in Chibizyi Society went up from 31,804 bags in 1977 to 49,801 bags in 1981 an increase of 56.6 per cent, whereas in Muzoka Society production declined from 19,447 bags in 1977 to 9,862 bags in 1981 a decline of 49.3 per cent. Production per member changed from 71.8 bags to 112.4 bags in Chibizyi Society in this period a percentage increase of 56.5 and from 46.9

bags to 15.2 bags in Muzoka Society a percentage decline of 67.6^2 (see Fig. 4.1 a and 4.1b).

Sunflower

The production of sunflower between 1977 and 1980 has been rising in both societies. The average production for Chibizyi Society was 2,220 bags within this four year period, while for Muzoka Society it was 627 bags. Average production per society member was 5.0 bags for Chibizyi Society and 1.1 bags for Muzoka Society. Production in Chibizyi Society went up from 2,271 bags in 1977 to 3,088 bags in 1980, an increase of 36.0 per cent whereas in Muzoka Society production went up from 430 bags in 1977 to 1339 bags in 1980, an increase of 211.4 per cent. Production per member changed from 5.1 bags to 7.0 bags in Chibizyi Society in this period and from 1.0 bag to 2.3 bags in Muzoka Society, percentage increases of 37.3 and 56.5 respectively (see Fig. 4.1c and 4.1d)

Groundnuts

Groundnut production showed the greatest fluctuations. Production varied considerably in both societies. The average production for Chibizyi Society between 1977 and 1980 was 185 bags within this four year period, while for Muzoka Society it was one bag. In both areas groundnuts do not now form one of the major products marketed through the Government sponsored

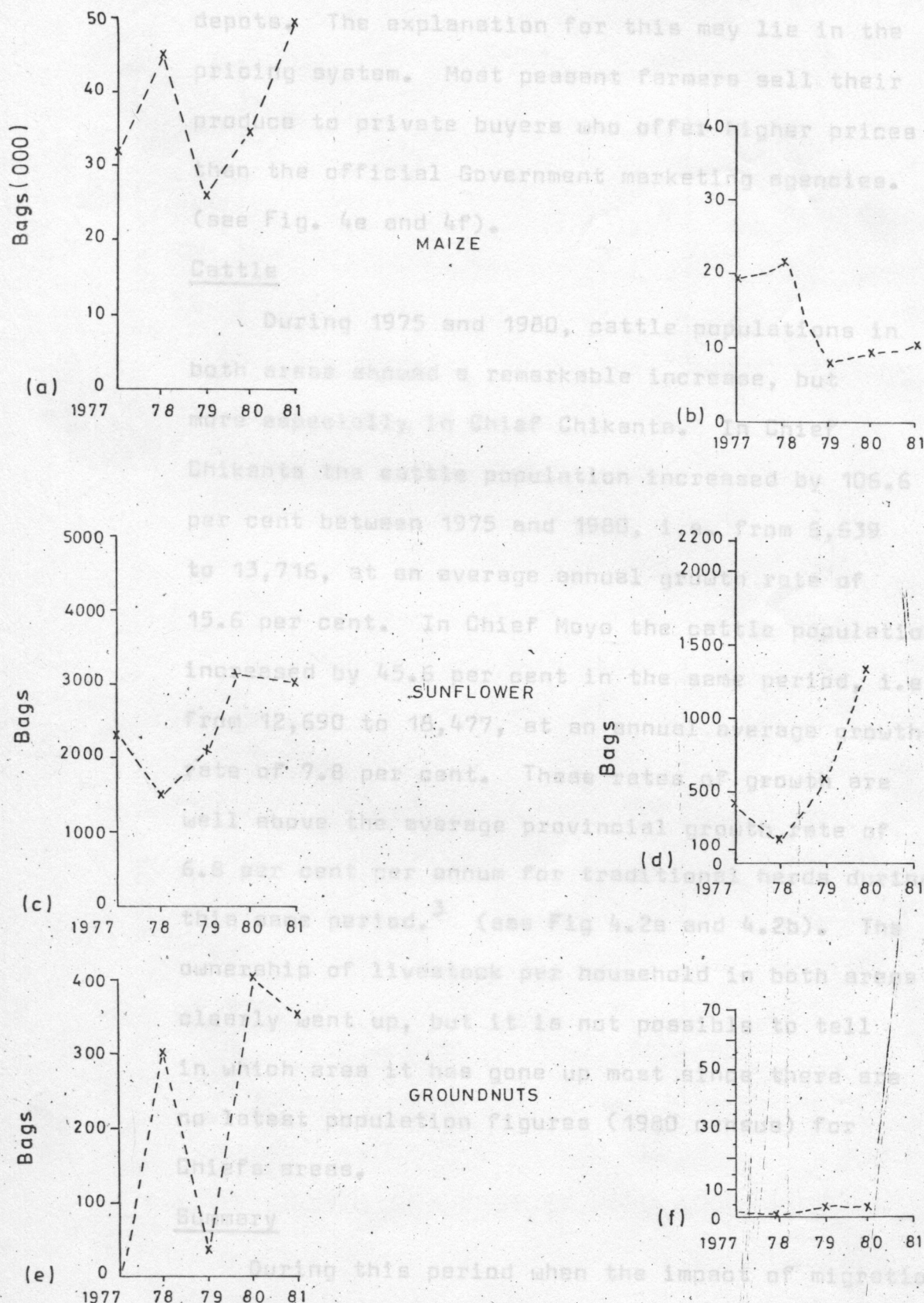


Fig. 4.1: PRODUCTION OF MAIZE, SUNFLOWER AND GROUNDNUTS (Source: S.P.C.M. U, 1982)

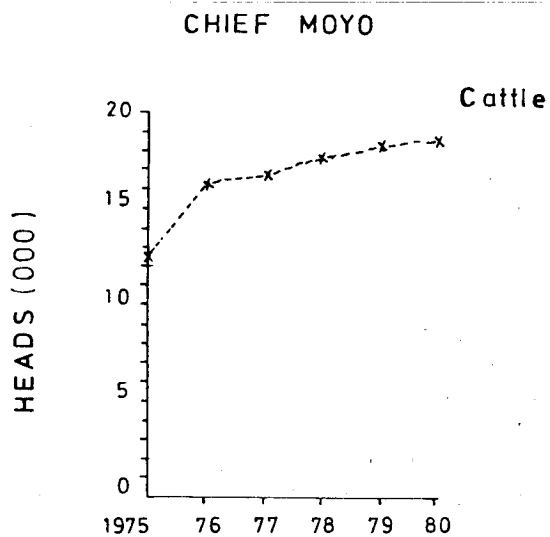
depots. The explanation for this may lie in the pricing system. Most peasant farmers sell their produce to private buyers who offer higher prices than the official Government marketing agencies. (see Fig. 4e and 4f).

Cattle

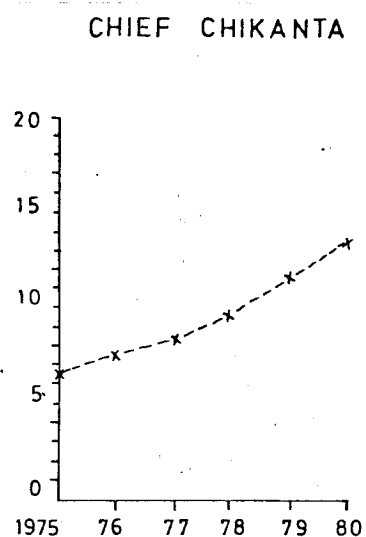
During 1975 and 1980, cattle populations in both areas showed a remarkable increase, but more especially in Chief Chikanta. In Chief Chikanta the cattle population increased by 106.6 per cent between 1975 and 1980, i.e. from 6,639 to 13,716, at an average annual growth rate of 15.6 per cent. In Chief Koyo, the cattle population increased by 45.6 per cent in the same period, i.e. from 12,690 to 18,477, at an annual average growth rate of 7.8 per cent. These rates of growth are well above the average provincial growth rate of 6.8 per cent per annum for traditional herds during this same period.³ (see Fig 4.2a and 4.2b). The ownership of livestock per household in both areas clearly went up, but it is not possible to tell in which area it has gone up most since there are no latest population figures (1980 census) for Chiefs areas.

Summary

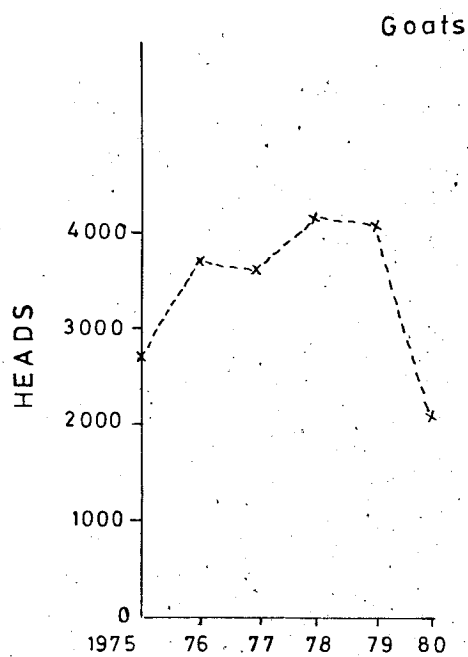
During this period when the impact of migration has been felt (1977-1981), agricultural production at society level has increased in the destination



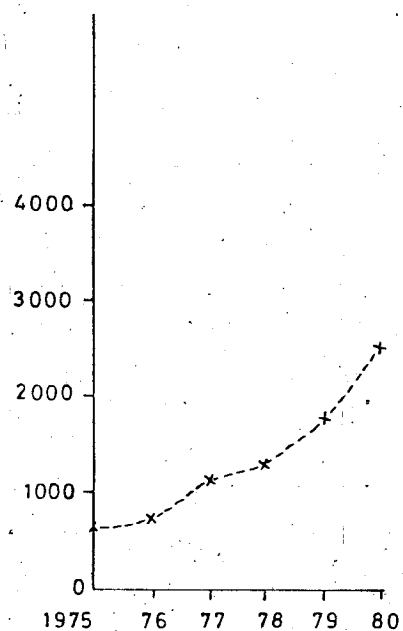
(a)



(b)



(c)



(d)

Fig. 4-2: GROWTH OF LIVESTOCK POPULATION (Source: G.R.Z, 1980)

more than in the source, so it appears that, the destination is benefitting more from migration than the source area. However, a clearer picture can be obtained from the study of changes in production by sampled population of migrants interviewed in Chibizyi Society and non-migrants interviewed in Muzoka Society.

4.03 CHANGES IN MAIZE PRODUCTION BY SAMPLE POPULATION

Present situation

When production performances at the time of the survey in the sample areas are compared between the migrants who had moved to Chibizyi Society and the non-migrants who remained in Muzoka Society, it is clear that the migrants produced more than the non-migrants. The average level of production per household by the migrants and non-migrants at the time of the survey was 235.8 and 95.7 bags of maize respectively. About forty-five per cent of the migrants were producing above 200 bags of maize, while only 6.6 per cent of the non-migrants were producing more than 200 bags of maize per year (see Table 4.1).

Bags of Maize (90 KG)

	0	1-50	51-100	101-200	200+
Migrants	0	15	15	25	45
Non-migrants	13.3	20.0	36.6	23.3	6.6

Table 4.1 Percentage production of marketed maize by migrants and non-migrants (1982)

Pre-move

The higher production figures of maize that are being achieved in the destination can be traced back to the source areas. The migrants before migrating were then producing more than the non-migrants. While in the early 1970's the average production per household for the non-migrants was 43.4 bags, the average production for the migrants at that time before moving was 108.5 bags per household. Sixty-five per cent of the migrants before moving produced between 51 and above 200 bags of maize, while only 29.9 per cent of the non-migrants at the time produced in this range (see Table 4.2)⁴

Bags of Maize (90 KG)

	0	1-50	51-100	101-200	200+
Migrants	0	35	30	20	15
Non-migrants	30	40	23.3	6.6	0

Table 4.2: Percentage production of marketed maize by migrants pre-move and non-migrants at that time (early 1970s)

Migrants before and after move

As a result of moving migrants increased their production of marketed maize. Their average production increased from 108.5 bags to 235.8 bags per household, with forty-five per cent producing above 200 bags after moving by 1982 as

compared to only fifteen per cent in the source area in the early 1970's. The rise for the whole group was a percentage increase of 117.37 per cent (see Table 4.3).

	Bags of maize (90 KG)				
	0	1-50	51-100	101-200	200+
Migrants pre-move	0	35	30	20	15
Migrants post-move	0	15	15	25	45

Table 4.3: Percentage production of marketed maize by migrants pre-move and post-move
Non-migrants before and after migrants moved

Between the early 1970's and at the time of the survey non-migrants also increased their production of marketed maize. The percentage of those not producing for the market decreased from thirty per cent to thirteen per cent, while that of people producing above 200 bags of maize rose from nothing to six per cent. Between this time period they increased their average production per household from 43.4 bags in the early 1970's to 95.7 bags per household, an increase of 120.5 per cent (see Table 4.4).

	Bags of maize (90 KG)				
	0	1-50	51-100	101-200	200+
Non-migrants pre-move	30	40	23.3	6.6	0
Non-migrants post-move	13.3	20	36.6	23.3	6.6

Table 4.4: Percentage production of marketed maize by non-migrants before and after departure

Summary

The production by migrants in Chibizyi Society reflects the trends in production at the society level although migrant's production went up more than the society production, i.e. 117.3 per cent compared to 56.6 per cent. In Muzoka Society production overall and production per society member fell, i.e. by 49.3 per cent and 67.6 per cent respectively. During this same period, 1977-1981, production by the sample population of non-migrants increased by 120.5 per cent, a percentage increase larger than that of the migrants. In this instance, Chibizyi Society is benefitting from the good farmers moving into the area. Their production has been a major influence on overall increased production per head as well as in the society as can be seen by the percentage increases for the two groups. In Muzoka Society production has gone down primarily due to good farmers leaving. But on the other hand, the loss of good farmers has led to more land being released to some people amongst the sample population and hence their individual production has gone up.⁵

4.04

INFLUENCES UPON PRODUCTION TRENDS OF MIGRANTS AND NON-MIGRANTS

Changes in agricultural production may be a result of a variety of influences. Here attention is focussed on characteristics of migrants and

and non-migrants in explaining their different responses in terms of production to the migration situation. Emphasis will be placed on age, education, labour, land, capital resources and credit.

4.04.1 Personal characteristics of migrants

Age

In migration studies, selectivity of age has often been emphasized. Most studies have claimed that the typical migrant in Africa is young.⁶ Youth influences production in two ways, young people tend to be more energetic and to have greater formal education than older people, which tends to encourage increased output. However, they often have limited capital resources and agricultural experience and so they do not have the same potential for agricultural production as many of the older farmers. In the destination there seems to be some truth that most of the migrants are young adults. Most of the migrants in the destination are men and about 73.3 per cent of these household heads are between the ages of sixteen and thirty-nine years, while among the non-migrants only 46.6 per cent are under thirty-nine years. The average for the migrants was 36 years at the time of the survey, while that of the non-migrants was 43 years a difference of 7 years (see Table 4.5). To try and see if there was a

correlation between age and production between the migrants and non-migrants Spearman's rank correlation was used.

AGE

	-20	20-29	30-39	40-49	50-59	60+
Migrants	16.6	33.3	23.3	13.3	10.0	3.3
Non-migrants	0	20.0	26.6	33.3	16.6	3.3

Table 4.5 Age of migrants and non-migrants
Education

The importance of education in migration studies lies in the fact that, the greater education a person has, the more likely they are to have drive and greater aspirations in life which tend to stimulate movement and the desire to increase production. It is often claimed that education acts as a major influence upon internal migration.⁷ There seems to be a difference in educational attainment between migrants and non-migrants. More migrants attained seven years of education and above compared to non-migrants, i.e. 49.9 per cent compared to 39.9 per cent respectively (see Table 4.6). What remains to be seen is whether there is a correlation between education and agricultural production. Here again the use of Spearman's rank correlation is required.

	Grades									
	0	1	2	3	4	5	6	7	8+	10
Migrants	0	0	33	0	13.3	16.6	16.6	33.3	16.6	
Non-migrants	0	0	10	10	13.3	6.6	20	26.6	13.3	

Table 4.6 Educational attainments of migrants and non-migrants

Summary and results

In this study the data seems to support only one view of the previous studies cited above, i.e. that young educated people are more mobile than old less educated people. Beyond this, the rest of the results show either a lack of correlation or a negative correlation between education and production and age and production.

Considering the influence of age on production, the Spearman's rank correlation (r_s) showed that there was a high positive correlation between age and production of maize amongst the migrants of +0.87. This was statistically significant both at 0.05 and 0.01 levels of significance. Amongst the non-migrants there was a negligible relationship of -0.05, which was not statistically significant. This means that, contrary to results yielded from previous studies which showed that the younger the migrants the greater their production, in this instance the older the migrants are the greater their production is likely to be.

Among the non-migrants age plays a minimal role in determining production.

The influence of education on production showed similar confusing results. Amongst the migrants, there was a negative relationship of -0.55 , which was statistically significant at both the 0.05 and 0.01 levels of significance. In the case of non-migrants there was a negligible relationship of -0.11 between education and production. This was not statistically significant. This means that in certain instances the higher the education the less one is likely to produce, while in certain instances there will be no association between education attained and the production of maize. Thus in this study despite evidence at group level when individual data is studied, age and education cannot be used to explain the variations in production between migrants and non-migrants (see appendix B for the data used).

4.04.2 Economic resources of migrants and non-migrants Land

It was pointed out that both the migrants and non-migrants increased their production of marketed maize. Migrants made a greater quantitative increase and their production went up by 117 per cent, while the non-migrants increased their production by 120 per cent. Land cultivated for maize increased from an average of 4 hectares

per household by the migrants to 6 hectares per household, an increase of 50 per cent. Amongst the non-migrants, land cultivated for maize increased from 2.2 hectares per household to 3.2 hectares, an increase of 45.5 per cent. These changes in man-land ratios resulted in increases in production per hectare as well. Migrants increased their production per hectare from 27.1 bags in the mid 1970's to 39.3 bags at the time of the survey, an increase of 45.0 per cent, while the non-migrants increased their production from 19.72 bags per hectare in the mid 1970's to 29.9 bags per hectare at the time of the survey, an increase of 51.6 per cent. Two questions may be asked of this data: How much is migration, by giving people more land, responsible for increased production and how much is increased production due to increase in production per hectare for both the migrants and non-migrants? (see Table 4.7, 4.8, 4.9 and 4.10).

	Land owned (ha)		Land cultivated (ha) Maize	
	0-8	8+	0-2.2	2.2+
Migrants	10.0	90.0	15.0	85.0
Non-migrants	56.6	43.3	46.6	53.3

Table 4.7: Amount of land held and cultivated by migrants and non-migrants at the time of the survey.

	Land owned (ha)		Land cultivated (ha) Maize	
	0-8	8+	0-2.2	2.2+
Migrants before moving	65.0	35.0	40.0	60.0
Non-migrants	76.6	23.4	53.3	46.6

Table 4.8: Amount of land owned and cultivated by migrants and non-migrants before the departure of migrants

	Land owned (ha)		Land Cultivated (ha) maize	
	0-8	8+	0-2.2	2.2+
Migrants before moving	65.0	35.0	40.0	60.0
Migrants after moving	10.0	90.0	15.0	85.0

Table 4.9: Amount of land owned and cultivated by migrants before and after migrating

	Land owned (ha)		Land cultivated (ha) maize	
	0-8	8+	0-2.2	2.2+
Non-migrants pre-migrants' move	76.6	23.3	53.3	46.6
Non-migrants post-migrants' move	56.6	43.3	46.6	53.3

Table 4.10: Amount of land owned and cultivated by non-migrants before and after the departure of migrants.

Summary

Considering the influence of land on production of marketed maize, it can be said that both increased land holding and yield per hectare were responsible for the increase in production of marketed maize. However, despite this, other factors played a role in the increased production of maize in both areas. These are considered below. One of the reasons that may explain the increase in production in the destination may be the question of soils. The soils in the destination are relatively fertile since they have only recently been cleared by the migrants and there is less soil erosion in this gently undulating terrain. Also, with improved methods of farming discussed in chapter three i.e. winter ploughing and increased use of fertilizer, production per hectare (yields) are likely to have increased. But on the other hand yields may not be as high as expected due to extensive use of the land in the destination where land is plentiful compared to the more intensive use of the land in the source area. Increased production in the source area may be attributed also to the availability of good soils from land the migrants abandoned. (When migrants were using the same land they were getting better yields than the non-migrants so it may be that they held the areas of better soils). Improved farming techniques in

the area also partly explain this increase. A good percentage of the people can now afford to use fertilizer and do practice winter ploughing which ensures higher yields. It is therefore not possible to pinpoint a particular point which is responsible for increased production. Many points contribute to this, although landholding is the major one.

Labour

Labour, like the other two factors of production, i.e. capital resources and land, plays an important role in determining levels of production. To what extent is increased and higher production by the migrant and non-migrant households due to labour resources which both groups have? In fact the opposite is true, migrants have less labour and had less labour prior to moving compared to non-migrants excluding labour hired. The average household size in labour units for migrants prior to migrating in the mid- 1970's was 5.6 persons excluding hired labour and productivity was 19.7 bags per head, the corresponding figures for non-migrants are 6.8 persons and 6.4 bags per head.⁸ At the time of the survey the average household size in labour units for the migrants increased from 5.6 persons to 6.6 persons and productivity was 35.7 bags per head, the corresponding figures for non-migrants are 7.8 persons and 12.3 bags per head.

Since the total labour units do not include labour hired, migrants may have depended on hired labour. This is suggested by the fact that both prior to migrating in the mid 1970's and at the time of the survey migrants hired more labour compared to non-migrants (see Table 4.11 and 4.12).

	Hired labour	Did not hire labour
Migrants pre-move	30.0	70.0
Non-migrants	28.57	71.43

Table 4.11: Percentage of migrants and non-migrants who hired labour at the time of the survey.

	Hired labour	Did not hire labour
Migrants pre-move	25.0	75.0
Non-migrants pre-move	17.85	82.15

Table 4.12: Percentage of migrants before moving and non-migrants who hired labour (mid 1970's)

Summary

Considering the influence of labour on production, it can be concluded that due to different landholdings, it appears that migrants' labour is more fully used than non-migrants' and in better

combinations with other factors of production, especially land as migrant households' produced more bags per head compared to non-migrants. Thus out-migration is one factor which appears to be leading to better distribution of labour relative to land and to higher productivity per head.

Capital resources

The question of land development discussed above is closely related to the availability of capital resources. The availability or lack of capital in any one situation, as in those production relationships outlined above, can affect production of maize. To ensure that it is not only land and labour that has been affecting production of maize in the past and present between the migrants and non-migrants, the effect of farming equipment on the production of maize is now considered.

An examination of the capital resources of the migrants and non-migrants before migrating in the mid 1970's and at the time of the survey reveals that there were very few differences in the ownership of the most essential farming equipment, such as cattle, trained oxen, ploughs, disc harrows and cultivators, between migrants and non-migrants. The percentage of those who owned two ploughs and two or more pairs of trained oxen between migrants and non-migrants before and after migration took place does not vary a lot so that

this does not appear to have affected the extent of fields ploughed between migrants and non-migrants (see Table 4.13 to 4.18).

Heads of cattle

	0	1-5	6-10	11-15	16-20	21-25	26-30	31-35	35+
Migrants post-move	0	10	45	0	10	10	5	5	15
Non-migrants	6.6	3.3	16.6	26.6	26.6	10	0	6.6	3.3

Table 4.13: Percentage ownership of cattle by migrants and non-migrants at the time of survey.

Heads of oxen

	0	2	3	4	5	6	7	8+	8+
Migrants post-move	0	35	5	15	5	15	0	10	15
Non-migrants	3.3	10	10	16.6	3.3	30	3.3	13.3	10

Table 4.14: Percentage ownership of trained oxen by migrants and non-migrants at the time of survey

Heads of cattle

	0	1-5	6-10	11-15	16-20	21-25	26-30	31-35	35
Migrants before departure	0	20	15	15	15	20	0	5	5
Non-migrants then	16.6	6.6	16.6	13.3	16.6	13.3	10	6.6	10

Table 4.15: Percent ownership of cattle by migrants before departure and non-migrants at that time (early 1970's).

Number of trained oxen owned

	0	2	3	4	5	6	7	8	8+
Migrants before departure	15	15	0	25	0	30	0	5	10
Non-migrants then	13.3	10	10	16.6	3.3	30	3.3	3.3	10

Table 4.16: Percentage ownership of trained oxen by migrants before departure and non-migrants at that time (early 1970's).

	<u>Ox - Plough</u>						disc	scotch
	1	2	3	tractor	cultivator	harrow	cart	
Migrants post-move	23.5	17.6	58.8	5		70.0	55.0	40.0
Non-migrants	22.2	25.9	51.9	0		83.3	80	53.3

Table 4.17: Percentage ownership of farming equipment by migrants at destination and non-migrants at the time of survey.

	<u>Ox-plough</u>						disc	scotch
	1	2	3	tractor	cultivaotr	harrow	cart	
Migrants pre-move	35.3	29.9	35.2	5	70		75	50
Non- migrants	37.0	25.9	37	0	73.3		60	43.3

Table 4.18: Percentage ownership of farming equipment by migrants pre-move and non-migrants at that time (early 1970's).

Number of trained oxen owned

	0	2	3	4	5	6	7	8	8+
Migrants before departure	15	15	0	25	0	30	0	5	10
Non-migrants then	13.3	10	10	16.6	3.3	30	3.3	3.3	10

Table 4.16: Percentage ownership of trained oxen by migrants before departure and non-migrants at that time (early 1970's).

	<u>Ox - Plough</u>					disc	scotch
	1	2	3	tractor	cultivator	harrow	cart
Migrants post-move	23.5	17.6	58.8	5	70.0	55.0	40.0
Non-migrants	22.2	25.9	51.9	0	83.3	80	53.3

Table 4.17: Percentage ownership of farming equipment by migrants at destination and non-migrants at the time of survey.

	<u>Ox-plough</u>					disc	scotch
	1	2	3	tractor	cultivaotr	harrow	cart
Migrants pre-move	35.3	29.9	35.2	5	70	75	50
Non- migrants	37.0	25.9	37	0	73.3	60	43.3

Table 4.18: Percentage ownership of farming equipment by migrants pre-move and non-migrants at that time (early 1970's).

Summary

The process of migration did not change the qualitative and quantitative ownership of equipment at all for both groups. The effects of ownership of farming equipment did not drastically alter the production capacities of both groups of people at all. Hence capital does little to explain differences in levels of production and change in production by either group following the movement of the migrants.

4.04.3 Socio-economic environment

Credit

To what extent is higher production by the migrants and non-migrants and increased production due to more credit? The Agriculture Finance Company (A.F.C.) plays a major role in lending peasant farmers working capital in both areas. Some of the people are greatly dependent on such loans. Amongst the migrants and non-migrants in the early 1970's, the non-migrants got more credit facilities from the Agricultural Finance Company. This could be because most of the migrants were able to do without any farming credits because they produced sufficient profit to enable them to buy most of the farming inputs they needed, especially fertilizer. This position did not change much in the mid 1970's when the migrants migrated to Chief Chikanta. The non-migrants in Muzoka Society still obtained more credit facilities than the migrants.

The differences in acquiring credit between migrants and non-migrants lies in the fact that most of the migrants are recent arrivals in the destination and as such the Extension Department is reluctant to recommend them at the expense of the indigenous population. The second reason is that the area is poorly served by the Agricultural Finance Company and so there are few opportunities for new people to get credit. Thirdly as earlier on pointed out, most of the migrants are self-sufficient and as such do not need to get credit.

In theory, the ability to get credit on the part of the non-migrants must have helped to boost production both in the past and present. Most of the problems lie in the fact that not all the people who get credit strictly use it for agricultural purposes, some re-sell the inputs to other people at reduced prices, and as such, mere figures on who gets credit will not be able to tell us the amount of produce, resulting from increased acquiring of loans from the Agricultural Finance Company. It can therefore be concluded that, the present rise in production and yield of maize on the part of the non-migrants may also have been influenced by their easy access to credit facilities from the Agricultural Finance Company. Although migrants production was not directly helped by the provision of credit facilities,

nonetheless they may have **gained** from the re-sale of inputs to other people at reduced prices, (see Tables 4.19 and 4.20).

	Got Credit	Did not get credit
Migrants	30.0	70.0
Non-migrants	80.0	20.0

Table 4.19: Percentage of migrants and non-migrants who got Credit at the time of the survey.

	Got Credit	Did not get Credit
Migrants before departure	46.6	53.3
Non-migrants	60.0	40.0

Table 4.20: Percentage of migrants before departure and non-migrants who got Credit.

4.05

CONCLUSION

Through the analysis of the four production relationships of marketed maize, it has been shown that both the migrants and non-migrants increased their production at the time that the migrants migrated to Chibizyi. Quantitatively the migrants increased their production more than the non-migrants while in terms of percentage increase the non-migrants increased their production

more than the migrants. The increase in production and yield can be attributed to a number of factors, some of them major ones and others minor ones. Access to land remains the major factor resulting in the changes in production. Considering the influence of land on the production of marketed maize, it can be said that increased land holdings obtained due to migration and a better combination of factors of production, especially land relative to labour and capital resources, resulted in increased yield and production. Other factors such as improved methods of farming, winter ploughing, application of chemical fertilizer and timely sowing may have helped to raise production and yield but the problem is that they may or may not have occurred in both areas. Considering the influence of labour on production it can be concluded that due to different landholdings, it appears that migrants' labour is more fully utilized than non-migrants and results in the production of more bags of maize per head and per household compared to the non-migrants. Thus, out-migration is one factor which appears to be leading to better distribution of labour relative to land and to higher production.

The effects of ownership of farming equipment did not drastically alter the production capacities of both groups of people at all. Hence capital

does little to explain differences in levels of production and change in production by either groups due to the movement of migrants. Similarly, access to credit only helped to boost the production of non-migrants while helping migrants little. Finally it can be said that, migration in this case is good by redistributing the population relative to land.

CHAPTER 4 FOOTNOTE REFERENCES

1. Society in this dissertation refers to an agricultural co-operative society which can be formed by not less than ten people.
2. No standard period of time is used for production years and ownership, four and five year periods are used due to non availability of information. Note should also be taken that society membership figures are suspect they may include producers or exclude producers. In addition to this, they have not been up-dated and therefore change in production per head overtime should be treated with care.
3. N. Mukutu, 'Beef and dairy production in Southern Province', Zambia Geographical Association No.28 (October 1974), 10.
4. Although the figures of maize production for early and mid 1970's are felt to be fairly accurate, nonetheless, there is need for caution as the memories of some of the people interviewed may not be that accurate.
5. There are two possible explanations to the anomalous trend in production in the source area. At society level membership figures are suspect they may include producers or exclude producers. At sample level production may have gone up due to the way the sampling was done i.e. purposive sampling. There might have been bias where interviews were

conducted with good farmers only and those who were fortunate enough to have taken some of the good land formerly occupied by the migrants.

6. A. Simons, S. Diaz-Briquets, A.A. Laquian, Social Change and Internal Migration: A Review of Research Findings from Africa, Asia and Latin America (Ottawa: International Development Research Centre, 1977), 10.
7. Simons, Diaz-Briquets, Laquian, Social Change and Internal Migration, 11.
8. The study is not dealing with people who hire permanent labour through-out the year, but deals with peasants who hire labour at peak seasons when labour is in demand, e.g. for harvesting and weeding. Since this lasts only for two to four days in a year, it is not possible to add this kind of labour to household labour.

CHAPTER 5

SUMMARY AND CONCLUSION

5.01 INTRODUCTION

The main objective of this study has been to attempt an examination of the nature of the relationship between intra-rural population migration in the Southern Province of Zambia and resource development. This was done at two levels of study, the provincial level and in two sample areas. Three theoretical relationships between migration and resource development were examined in this study. These were:

- (a) that migration narrows regional per capita income inequality between regions
- (b) that migration widens regional per capita income inequality between regions
- (c) that the influence of migration on inter-regional per capita income inequality is indeterminant and complex.

Arguments for and against each relationship were raised and it was pointed out that, any one of the three relationships may occur depending on a variety of reasons such as, the quality of migrants, level of development of the two areas concerned, and the relative availability of various factors of production.

5.02 Summary

The Study has reached a number of conclusions which are summarised below:

- (a) The migrants from Chief Moyo to Chief Chikanta moved for a variety of reasons, although the main determining factor was land. Sixty per cent of the migrants interviewed said they migrated to Chief Chikanta because of shortage of land and ten per cent because of poor quality of land while twenty per cent moved because they followed their guardians, and another ten per cent moved because of social problems. There is an acute shortage of land in Chief Moyo and as such many of the budding farmers, whose aim is to produce for the market, have found it necessary to migrate to Chief Chikanta in the Kalomo District.
- (b) Most of the farmers who have migrated had the largest land-holdings and produced the greatest amounts of marketed maize in Chief Moyo's area before moving. Prior to migrating the average land cultivated for maize per household was four hectares, and production of marketed maize per household was 108.5 bags, compared to 2.2 hectares and 43.4 bags of maize respectively by the non-migrants.

- (c) Through the process of migration, most migrants benefitted. Their average land cultivated for maize increased from four hectares to six hectares. Although their capital and equipment did not change their production per household increased by 117.3 per cent. The impact of changing production by both the migrants and the indigenous population of Chibizyi Society was increased total production and higher production per head, these figures increased respectively from 31804 to 49801 bags of maize and from 71.8 bags to 112.4 bags of a maize per head.
- (d) The departure of people from Chief Moyo who held more and better land has eased land pressure in that area, and has resulted in a better combination of factors of production relative to the population. This has resulted in both increased landholdings, and increased production and yield at the sample level, but at society level, this is not reflected as overall production has gone down by 49.3 per cent while production per head has gone down by 67.6 per cent. The reasons for such trends may be due to the out-migration of good farmers, and the combination of agricultural enterprises of the remaining farmers. Now that the good farmers have gone, average production per head and overall production have gone down despite the fact

that at the sample level production has gone up. This apparently anomalous situation may be due to the dominance of subsistence production among the remaining farmers and unrepresentative sampling. However, the question of errors in the data provided for the societies cannot be overlooked.

- (e) To this extent, one can say that migration has benefitted both areas at the sample level by redistributing land and so allowing increased production and higher yields. This in itself has had an effect of narrowing down per capita income difference between the migrants and non-migrants if maize production is used as a standard measure of income. However, at society level per capita income difference between the two regions has widened.
- (f) Although as a group, migrants benefitted from the process of migration through increased maize production, at individual level, ten per cent of the household did not benefit much because they lost their cattle.
- (g) Considering the impact of out-migration on the source area, one can say that, at the sample level, not every household gained

some land or enjoyed better combinations of factors of production such as labour, and capital. Some households did not gain any land at all. Similarly at society level, production per household did not go down for every household; some households maintained their levels of production while others went up in production. Hence resource development following migration had a more mixed effect in the source area than in the destination. Thus in this study the view that the influence of migration on regional per capita income inequality between regions is indeterminant, complex and flexible is supported.

5.03 Implications for Zambia

The study points to the fact that, most of the intra-rural migrations that occur in the country are of the selective nature. Impoverished areas, or areas with pressure of population on the land with very few socio-economic opportunities tend to lose good farmers into the areas where there are good farming and marketing opportunities. Initially, this sort of migration may be good because it will reduce the pressure on the land in the source area and allow better land/man ratios, and increased production per head and higher productivity of labour. But a stage is reached where the area will lose most of its good

farmers, and resources which were abandoned will not be well used or fully used thereafter. This will result in under-utilization of resources and will generally be accompanied by widening income gap if only poor quality farmers remain who cannot use land resources now available for them.

Major dangers lie in the fact that such migrations are not controlled nor are they government induced. This being the case, there is a likelihood of depopulation in the areas of out-migration while over population may occur in the areas of in-migration. In the areas of out-migration, under utilization of social and physical facilities such as school, health centres, dip tanks, depots, and dams may affect the quality of life and the productive capacities of the in-migrants. Being new to the environment migrants may also misuse the resources through overgrazing and monoculture practices leading to a deterioration of the environment.

5.04 General Application of the Model

How generally, can such a model be applied? This sort of a model is not very easy to apply in rural Africa. The problem of such a study in rural Africa is due to the fact that in rural Africa it is not very easy to quantify data on incomes

and as such it makes it very difficult to be accurate when analysing the data. It is far easier to use in an urban environment such as in the United States where it was developed. Applying this model to a rural situation in Africa one has to substitute factors such as capital with rough approximations of values of given commodities in order to examine whether out-flow and in-flow of a given quality of farmers would have an impact on the regional per capita income of two given regions. One expects either to find that the source region will lose good farmers to the destination thereby lowering the per capita income of the source or the source area losing poor farmers to the destination and thereby lowering down the per capita income of the destination and hence narrowing the gap between the two regions. Often in Africa areas with poor socio-economic opportunities will tend to lose good farmers to areas of abundant socio-economic opportunities thereby widening the gap in per capita income. In the case of the United States study by Okun and Richardson, it was the poor people who were leaving low-income growing regions to high-income growing regions and thereby narrowing down the per capita income between the low-income growing region and the high-income growing regions.

In this study, the data revealed that there was a higher percentage of good farmers who migrated

from Chief Moyo to Chief Chikanta. Probably, due to a better combination of factors of production such as labour, capital and land which occurred as a result of migration, at the sample level per capita income between the two regions was narrowed. On a wider context, regional per capita income widened. This in effect showed that the number of good farmers who left the source area had had an impact on the production of marketed maize on both areas, a negative one in the source area and a positive one in the destination. In sum this means that the migration of one set of farmers into another area will not produce a good result unless in a good combination with other factors of production.

In conclusion it can be said that the study has high-lighted how spontaneous out-migration can lead into a number of negative and positive situations. As such it is important to keep check on population movements so that the best can be got from them in terms of reducing inequality.

APPENDIX A

METHODOLOGY

Research work involved three methods of data collection, library research, laboratory study and fieldwork. The work was carried out at two scales of study, at the provincial level for general intra-rural migration, and at the sample area level for detailed analysis of rural-rural population movement and resource development.

(a) Provincial level

Library research.

This involved the collection of data on migration streams and their characteristics for all the seven districts in Southern Province from the special collection library of the University of Zambia and the Central Statistical Office, using the 1969 census data. Birth place data was available for 1969 population, growth figures for sub-district levels.

(b) Sample area level

The second and third methods of data collection concerned two sample areas in Southern Province, Chief Moyo (source area for the migrants) and Chief Chikanta (receiving area for the migrants). Chiefs Moyo and Chikanta were chosen for the study area after analysing data from a population growth map of Southern Province between 1963-1969. This

map showed considerable population increase for Chief Chikanta and a population decline for Chief Moyo. As the natural increase for the two areas is likely to vary only slightly, the only factor that explains these growth trends is migration.

Airphoto Interpretation

This involved analysing aerial photographs for 1970 and 1980 for each area - the source area and the destination.

Fieldwork

Information was collected from the Southern Province Co-operative Marketing Union and the Department of Veterinary on marketed maize, sunflower and ground-nuts, and on livestock population in the two study areas respectively.

Structured interviews and interview guides were also used to collect information in the two study areas.

In both the source and destination interview schedules were administered to 30 heads of households. This represented about 0.3 per cent the total population in the source area and about 3 per cent of the total population in the destination. The households were picked purposively to represent all categories of the population, i.e. subsistence, emergent or commercial farmers.

Using an interview guide discussions were held with eldersmen, village headmen, and extension workers.

These provided general information on the impact of migration on the socio-economic development of the area.

Data Analysis

The task of analysing and measuring the impact of migrants on both the source and receiving area was done in the following manner.

- (a) The characteristics of the migrants and non-migrants were tabulated to ascertain if the migrant population has any indentifying characteristics.
- (b) Changes in methods by which land resources are utilized by the rural population was also analyzed in order to assess the impact of migration on resource development.
- (c) Data from Southern Province Co-operative Marketing Union, Veterinary Department and field discussions allowed the researcher, to establish the changing patterns of resource utilization in the sample areas.

Limitations of data

One of the major serious limitations of the data is the method of analysing the spatial consequences and socio-economic impact of migration. Although attributes of migrants can be used to predict likely impacts, one can't be sure they will occur. Sample surveys fall far short of meeting the required standard to meaningfully interpret the

data. One needs a baseline survey and a follow up one. Normally one can only infer and ask what changes occurred and as such it is difficult to decide whether changes are due to migration or some other factors.

Finally, there is no consensus on the type of method to be used when analyzing the socio-economic impact of migration. Various disciplines use various methods. An interdisciplinary study and methodology of analysing socio-economic impact of migration is lacking and hence most studies meet only individual disciplinary demands and needs.

APPENDIX B

NON-MIGRANTS

X	Y	X
AGE	BAGS OF MAIZE 90 KG	EDUCATION ATTAINED (GRADE)
58	70	2
28	60	10
30	80	7
60	65	7
37	60	7
47	10	7
54	90	3
46	250	3
40	300	6
46	150	7
37	100	6
44	120	4
44	80	6
26	70	10
45	150	5
35	70	6
28	80	4
69	100	4
55	300	2
46	100	7
47	100	7
44	50	4
52	50	6
40	100	7
43	200	5

MIGRANTS

X	Y	X
AGE	BAGS OF MAIZE 90 KG	EDUCATION ATTAINED (GRADE)
21	50	7
28	50	7
32	70	9
30	50	7
32	100	6
25	40	7
40	70	5
36	60	9
50	800	5
50	400	7
40	300	4
35	60	4
25	40	10
52	400	1
32	100	6
40	150	4
70	200	2
55	100	5
60	400	6
36	120	9
40	400	4
55	700	5
27	600	7
24	30	7
22	35	7

NON-MIGRANTS: CORRELATION OF AGE AND PRODUCTION
OF 90KG BAGS OF MAIZE

R

Ranked	X	Ranked	Y	D	D ²
	3		17	-14	196
	23.5		20.5	+ 3	9
	22		14	+ 8	64
	2		19	-17	289
	19.5		20.5	- 1	1
	7.5		25	-17.5	306.25
	5		12	-17	49
	10		2	+ 8	64
	17.5		1	+16.5	272.25
	10		4.5	+5.5	30.25
	19.5		9	+10.5	110.25
	14		6	+ 8	64
	14		14	0	0
	25		17	+ 8	64
	12		4.5	+ 7.5	56.25
	21		17	+ 4	16
	23.5		14	+ 9.5	90.25
	1		9	- 8	64
	4		24	-20	400
	10		9	+ 1	1
	7.5		9	- 1.5	2.25
	14	28	22.5	-16.5	272.25
	6		22.5	-16.5	272.25
	17.5		9	+ 8.5	72.25
	16		3	+13	169
Sum to	325	sum to	325	$\Sigma(D)=0$	$\Sigma(D^2) = 2,734.50$

$$N = 25$$

$$P = 1 - \frac{6 \sum D^2}{N(N^2 - 1)}$$

$$\therefore P = 1 - \frac{6 \times 2,734.5}{25 \times 624}$$

$$\therefore P = 1 - \frac{16,407}{15,600} = 1.05$$

$$\therefore \underline{P = -0.05}$$

NON-MIGRANTS: CORRELATION OF EDUCATIONAL ATTAINMENT
AND PRODUCTION OF 90KG BAGS OF MAIZE

X	Y	D	D ²
24.5	17	+ 7.5	56.25
1.5	20.5	-19	361
6.5	14	- 7.5	56.25
6.5	19	-12.5	156.25
6.5	20.5	-14.0	196.0
6.5	25	-18.5	342.25
22.5	12	+10.5	110.25
22.5	2	+20.5	420.25
13	1	+12	144
6.5	4.5	+2	4
13	9	+ .4	16
19.5	6	+13.5	182.25
13	14	- 1	1
1.5	17	-15.5	240.25
16.5	4.5	+12	144
13	17	- 4	16
19.5	14	+ 5.5	30.25
19.5	9	+10.5	110.25
24.5	24	+0.5	0.25
6.5	9	- 2.5	6.25
6.5	9	- 2.5	6.25
19.5	22.5	- 3.0	9
13	22.5	- 9.5	90.25
6.5	9	- 2.5	6.25
16.5	3	+13.5	182.25
sum to 325	sum to 325	$\sum(D) = 0$	$\sum(D^2) = 2,887$

$$N = 25$$

$$P = 1 - \frac{6 \sum D^2}{N(N^2 - 1)}$$

$$\therefore P = 1 - \frac{6 \times 2,887}{25 \times 624}$$

$$\therefore P = 1 - \frac{17,322}{15,600} = 1.11$$

$$\therefore \underline{P = -0.11}$$

MIGRANTS: CORRELATION OF AGE AND PRODUCTION
OF 90 KG BAGS OF MAIZE

X	Y	D	D ²
25	20	+5	25
19	20	-1	1
16	14.5	+1.5	2.25
18	20	-2	4
16	12	+4	16
21.5	22.5	-1	1
9.5	14.5	-5.5	30.25
12.5	17	-4.5	20.25
6.5	1	+5.5	30.25
6.5	4.5	+2	4
9.5	7	+2.5	6.25
14	17	-3	9
21.5	22.5	-1	1
5	4.5	+1	1
16	12	+4	16
9.5	9	+0.5	0.25
1	8	-7	49
3.5	12	-8.5	72.25
2	4.5	-2.5	6.25
12.5	10	+2.5	6.25
9.5	4.5	+5	25
3.5	2	+1.5	2.25
20	17	+3	9
23	25	-2	4
24	24	0	0
sum to 325	sum to 325	$\sum(D) = 0$	$\sum(D^2) = 341.5$

$$N = 25$$

$$P = 1 - \frac{6 \sum D^2}{N(N^2 - 1)}$$

$$\begin{aligned} & \cdot \\ \cdot \quad \cdot \quad P &= 1 - \frac{6 \times 341.5}{25 \times 624} \end{aligned}$$

$$\begin{aligned} & \cdot \\ \cdot \quad \cdot \quad P &= 1 - \frac{2,049}{15,600} = 0.13 \end{aligned}$$

$$\begin{aligned} & \cdot \\ \cdot \quad \cdot \quad \underline{P} &= \underline{+0.87} \end{aligned}$$

MIGRANTS: CORRELATION OF EDUCATIONAL ATTAINMENT
AND PRODUCTION OF 90KG BAGS OF MAIZE

X	Y	D	D ²
8.5	20	-11.5	132.25
8.5	20	-11.5	132.25
3	14.5	-11.5	132.25
8.5	20	-11.5	132.25
14	12	+ 2	4
8.5	22.5	-14	196
17.5	14.5	+ 3	9
3	17	-14	196
17.5	1	+16.5	272.25
8.5	4.5	-14	16
21.5	7	+14.5	210.25
21.5	17	+ 4.5	20.25
1	22.5	-21.5	462.25
25	4.5	+20.5	420.25
14	12	+ 2	4
21.5	9	+12.5	156.25
24	8	+16	256
17.5	12	+5.5	30.25
14	4.5	+ 9.5	90.25
3	10	- 7	49
21.5	4.5	+17	289
17.5	2	+15.5	240.25
8.5	17	- 8.5	72.25
8.5	25	-16.5	272.25
8.5	24	-15.5	240.25
sum to 325	sum to 325	$\sum(D) = 0$	$\sum D^2 = 4,035$

$$N = 25$$

$$P = 1 - \frac{6 \sum D^2}{N(N^2 - 1)}$$

$$\therefore P = 1 - \frac{6 \times 4,035}{25 \times 624}$$

$$\therefore P = 1 - \frac{24,210}{15,600} = 1.55$$

$$\therefore \underline{P = -0.55}$$

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