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POPULATION AND AGRICULTURAL LAND USE IN THE MANYA KROBO DISTRICT

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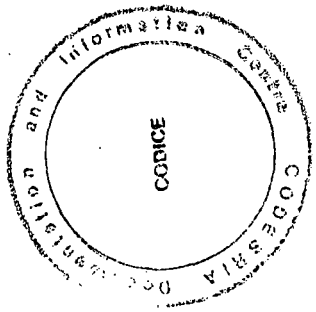

A thesis presented in fulfilment of the requirements for admission to the Doctor of Philosophy Degree in Geography and Resource Development, University of Ghana.

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JUNE, 1993.

DEDICATED TO MY AILING WIFE:
MRS ELIZABETH MAMLE BEDELE

DECLARATION

I declare that, except for references to other people's work which have been duly acknowledged, this work is the result of my own research; and that this thesis has neither, in part or in whole, been presented elsewhere for another degree.

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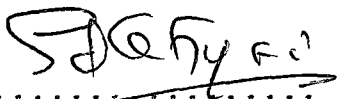

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Date:.....

ABSTRACT

The Manya Krobo District is in the Eastern Region of Ghana. The predominant people of the district are the Krobo who are mostly farmers. Indeed a number of researchers have described the Krobo as industrious farmers. Another characteristic feature of the district is the rapid population growth.

The two variables: the rapid population growth of the Krobo and their agricultural activities, make the Manya Krobo District an ideal rural area for the examination of the relationship between population growth and agricultural land use.

By 1731, the Krobo had become firmly established on the Krobo Mountain in the north-eastern part of the Accra Plains. As a result of rapid populaton increase, they acquired agricultural land from their Akan neighbours. By 1950, the Krobo had penetrated Akan lands as far as the southern parts of the Afram Plains, about 300 kilometres north-west of the Krobo Mountain. The land acquisition process was greatly influenced by the changing attitude of the Akan landowners. Thus while the process was peaceful at some stages, at other stages, it was characterised by clashes.

The rapid population growth of the district has great impact on the land use. Indicators of population stress like: land fragmentation, changes in frequency of cropping, environmental degradation, changing landholding patterns, decreasing crop yields, changing crop patterns and disputes over land ownership are now common features of the agricultural landscape.

The population, in turn, does not remain static: it is responding to the agricultural land use change. There are signs of population mobility, changing perception about fertility levels and the use of the family as a source of labour, rising educatonal levels and occupational change.

To address the problem of population pressure in the district, there is the need for carefully planned programmes to tackle both the problems of rapid population growth and inefficient agricultural land use.

PREFACE

The total world population of about 5,128 million in 1988 has increased rapidly to 5,508 million by 1993 with an annual natural growth rate of 1.6 percent (World Population Data Sheet, 1988 and 1993). Ironically, about 76.3 per cent (4,276 million) of this large world population is found in the less developed world where resources are less abundant. It is also in this part of the world where annual growth rates are high. For example Ghana's total population of 14.4 million in 1988 has increased to 16.4 million by 1993 with an annual growth rate of 3.1 per cent (World Population Data Sheet, 1988 and 1993).

Generally, it is not the crude population figure which is alarming. Rather it is the high rate at which the population is growing annually. There exists the fear that soon the world's resource might be inadequate to sustain this rapidly increasing population. This fear underscores the close relationship that exists between the human population and the resources of the earth.

While in the developed world the relationship between the population and agricultural supply might not be very obvious, in the developing countries, particularly in the communities where agriculture is the predominant occupation, the relationship is very close.

The Manya Krobo District in Southeastern Ghana is one of the rural areas in the developing world where such close relationship between the population and agricultural land use exists. In this

district, the population is increasing rapidly and agriculture is, essentially, the occupation of the people. Indeed a number of researchers have described the Krobo of the district as industrious farmers.

This thesis examines the relationship between the rapidly growing population and the agricultural land use. There exists a general debate on the direction of the causal relationship between population growth and agricultural change (Malthus, 1798; Beserup, 1965 and Matzner, 1982). This debate is used as a research framework within which the examination is made. Operationally, however, the term "population growth" is given a wider scope to encompass other pertinent demographic variables. "Agricultural change/intensification" is equally given a broader definition to include relevant agricultural variations.

Though the study focuses principally on the relationship between population and agricultural land use, the involvement of other variables like the external market, transportation and industrialization is also comparatively examined. To the Krobo farmer, agriculture is a way of life. The Krobo year calendar is a reflection of the agricultural activities of the people. Similarly the traditions, aspirations and values of the people are closely related to their agricultural practices. For a clear understanding of the relationship between the people and their agricultural land use, therefore, it is considered pertinent to relate these traditions, rites, aspirations and values to the interaction between the two variables. Obviously it could not be

rightly argued that the interaction between population and agricultural land use is exclusive and that it precludes the involvement of other factors.

In Chapter One, the problem is clearly defined and the methodology is carefully outlined. Inclusive in this chapter are the objective, the literature review, the statement of the research hypothesis and a short background to the study.

Chapter Two examines the growth of the population, its distribution, sex and age composition, mobility, and other demographic characteristics which are found to be pertinent to the study. The land that the Krobo now occupy formerly belonged to their Akan neighbours. Chapter Three thus traces the processes of land acquisition and examines the pertinent concepts like, group formation for land acquisition and individual land ownership.

In Chapter Four, the analysis of the inter-relationship between population and agricultural land use in the district is done whilst Chapter Five looks at the demographic responses to the agricultural change. Chapter Six concludes the study.

University of Ghana, David K. Bedele
Legon.
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TABLE OF CONTENTS

Page

Page

Page

TABLES

Page

LIST OF FIGURES

Page

CHAPTER ONE

THE PROBLEM AND RESEARCH METHODOLOGY

1.1 INTRODUCTION

The relationship between population and agricultural land use has become a topic of considerable interdisciplinary interest; geographers, agronomists, anthropologists, demographers and economists alike do make constant reference to it in their discussions (Metzner, 1982). The importance of this relationship stems from the fact that man must eat in order to live and needs clothing to protect himself from the hazards of the weather. There is the fear that existing systems of farming might not be able to provide adequately the required food and clothing to support the teeming population of the world.

The "explosive growth" of population in the past few decades has been accompanied by a relatively slow rate of increase in agricultural production in many parts of the world. For example, in Ghana, the annual agricultural growth rate in 1985 was only 0.5 percent (Ministry of Finance & Economic Planning [MFEP], 1987, and in 1987, it was 1.4 percent (MFEP, 1989). Annual agricultural growth from 1986 to 1990, as a whole, was only - 5 percent. During the same period, the annual population growth rate was 2.6 percent Bank of Ghana (1988). This situation has led an increasing number of people to recognize that one of the most pressing problems facing the human race today, and for the

foreseeable future, is that of maintaining a balanced relationship between the human population and agricultural production. It is true that to many well-fed people in the industrial countries of the world where an assured food supply in the shops and supermarkets is accepted as a fundamental right, this problem may seem to be of little immediate concern. Nevertheless, even in those countries, there are people who can remember times when their food supplies were not assured; and indeed were denied to a large section of the community (Hutchison, 1969).

The concern that the rate of growth of the human population tends to outrun that of food production existed before the days of Robert Malthus, the first man to come out with a population theory. However, it has become abundantly clear that this phenomenon is characteristic of poor developing and predominantly agricultural countries. The available data leads to the conclusion that in most African countries, the rate of increase in food production lags behind that of population (Engmann, 1972). The frequent reports of severe food shortages in many parts of the continent partly confirm this conclusion. A situation such as this, if unchecked, will lead to a further depression of the low standard of living and a deterioration of the social and economic conditions.

On the whole, agricultural produce, especially food supply, is inadequate for the poor members of the world and often uncertain for even the well-to-do. Unfortunately, the root causes of the circumstances in which population growth outstrips food production are not very clear. Explanation may however be found in the lack

of any appreciable understanding of the relationship between population situations and agricultural land use. It is important that there should be appreciation and understanding of the nature of the problem; for, it is conceivable that some of the problems of maintaining this balance between population and agricultural production being experienced at present, especially in the developing world, may be our problem or that of our children if we do not take the appropriate remedial action in time (Hutchison 1969, p.vii).

Yet the relationship between the human communities and the biological resources on which they depend, though fundamental to man's very existence, is imperfectly understood and had rarely been considered worthy of academic investigation. Recently, however, it has aroused widespread interest and has generated much debate in academic circles.

Much of the debate on the relationship between population and agricultural production, nevertheless, assumes a uni-directional trend. Either that it is food supply which influences population change (Malthus, 1798); or that it is population growth that determines agricultural intensification (Boserup 1965). This uni-directional approach is certainly inadequate and unrealistic for the relationship is a complex one. There is a growing need to examine the problem in a multi-directional way. As Caldwell rightly puts it, "the relationship between population and agriculture is complex and must be analyzed in both directions" (Caldwell, 1975).

Furthermore, available investigations into the problem have essentially focused on the relationship between population growth/density and agricultural change. Other population characteristics like distribution and pressure; migration, family size and households are often left out of the analysis. Similarly, such important land use aspects as farming systems, land tenure systems and land holding arrangements are either given only partial treatment or are totally ignored in the investigations. In essence, these omissions render the investigations incomplete and the findings inconclusive.

Thus, though there have been some studies on the relationship between population and agriculture, the need for a more comprehensive study using a multi-directional approach to arrive at a more meaningful relationship between the two variables still exists.

1.2 STATEMENT OF THE PROBLEM

By 1731, the Krobo had firmly settled on the Krobo Mountain. Initially it was only a few people who followed their hunter-leader to settle on the mountain (Azu, 1926). A number of factors, however, promoted rapid population growth among the people. These factors included:

1. The safety provided by the Krobo Mountain. This factor minimized war casualties in the early days when ethnic conflicts were common. (Azu, 1926; Huber, 1963).

2. The prolific nature of the Krobo women who have an average fertility of 6 to 7 children.
3. The assimilation of immigrants into the Krobo population while on the Krobo Mountain.

Rapid population growth in Kroboland (Yilor and Manya Krobo) is not a demographic phenomenon of the past only. It is also characteristic of the contemporary population. The estimated population of 40,000 in 1889 (Macdonald, 1889) rapidly increased to 220,000 in 1984 (Ghana Population Census Report, 1984). The Manya Krobo District, in particular, has a large population of 134,530 people (1984 Population Census) spread over an area of 1,279 square kilometres. This gives a crude population density of about 105 persons per square kilometre. In some localities, especially in the Sekesua-Agbelitsom area, however, densities reach 300 persons per square kilometre (Gyasi, 1975). Indeed the Manya Krobo District has the largest population among the neighbouring districts. At present, the district is experiencing out-migration of farmers who wish to acquire new agricultural lands outside the area. Other migrants also find their way to the big towns inside and out of the country to seek non-agricultural work.

Occurring concurrently with the described population phenomena in the Manya Krobo District, is rapid expansion of agricultural land. At the time the Krobo settled on their home mountain, they had only the rocky mountain and the limited surrounding grassland as their agricultural land. When the population was small, there

was no problem of sustenance. With increasing population, nevertheless, the need for more agricultural land became very pressing. Unfortunately, the surrounding forest agricultural land belonged to the Akan neighbours of the Krobo.

Between 1850 and 1950, the Krobo acquired agricultural land from the Akan land owners from the Krobo Mountain in the South to the southern part of the Afram Plains in the north-west. This acquired agricultural land has become the traditional area of the Manya Krobo and is functionally termed the Manya Krobo District in this study.

The Krobo method of penetrating the agricultural lands of their Akan neighbours is their huza system of agriculture and settlement. But since about 1950, though the population of the Krobo continues to experience rapid growth, the Akan land owners are no more willing to sell new agricultural land to them. To aggravate the situation, the Volta Lake has flooded large tracts of the already acquired Krobo agricultural land. Now the agricultural land use in the district is characterized by land shortages, landlessness, land fragmentation, land disputes, environmental degradation and declining agricultural yield. The territorial expansion of the Krobo has also brought them into conflict with their Akan neighbours thus disturbing the peace of the region. There have been conflicts between the Akwamu, the Akwapim, the Akyem, the Kwahu and the Krobo over land ownership.

Often, in general terms, the demographic situation in Kroboland is held responsible for the agricultural conditions in

the area. Similarly, the agricultural system is at times partly blamed for the demographic characteristics. Yet there has not been any serious attempt to research into the inter-relationship between the population and the agricultural land use. It is true that the "Huza" systems of farming and settlement have interested notable scholars including Benneh (1970), La-Anyane (1958), Field (1943), Hill (1961) and Gyase (1975). Field even tried to relate the traditional institutions of the Krobo to their systems of farming and settlement. None of these scholars, however, has seriously investigated the population-agriculture inter-relationship in the district. Other people like Azu (1926), Odonkor (1971) Huber (1963) and Pogucki (1952) have also studied the historical and anthropological aspects of Kroboland without critically examining the inter-relationship between population growth and agricultural land use.

Thus in Kroboland, there still exists the need for a fuller understanding of the inter-relationship between the population and agricultural land use for more detailed socio-economic planning and other considerations. Although the general objective is a comprehensive examination of the relationship between the two variables using the multi-directional approach, the focus is on population characteristics and distribution, population growth and land acquisition, population growth and agricultural land use change and the demographic responses to land shortages in the Manya Krobo District.

The Manya Krobo District has been chosen because it is larger than the Yilor Krobo area and constitutes a single administrative District with fixed political boundaries within which the analysis could be done. It also has a larger population concentration and the area is noted for its agricultural activities.

Hopefully, on the agricultural side, the study can identify the demographic factors behind the constant crave for new lands among the Krobo. With proper guidance, this should lead to the planning of a more intensive and more permanent form of farming for the people and thus help to preserve the forest, conserve the environment and keep the peace in the forest areas of Ghana. Field has warned that if this crave for new lands is not checked, the Krobo would soon be found in the forest areas of the whole of West Africa. This prediction by Field is becoming a reality. The Krobo, as at present, have extended their farming activities beyond the Manya Krobo District. A large number of them are found in the forest regions of the Ashanti, Western and Brong Ahafo Regions. A few of them are even at the border with Cote d'Ivoire. On the demographic side, the study can help to identify the agricultural factors which make the Krobo prolific and help to reduce the level of out-migration in the district. This should help in formulating plans for an effective population policy for the country as a whole, and also suggest a more reliable family planning strategy for the district in particular.

1.3 OBJECTIVES

Population and agricultural land use are two key components in any rural socio-economic development process, In such a process, there is generally an interplay between the population factor and agricultural land use. The broad objective of the study, therefore, is the examination of the inter-relation between population growth, distribution and characteristics on one hand, and agricultural land use on the other. The specific objectives are:-

1. To critically analyze the growth, distribution and other characteristics of the population in the Manya Krobo District in relation to the agricultural land use.
2. To outline the factors, processes and types of land acquisition by the Krobo.
3. To investigate the role of population trends in agricultural changes in the District.
4. To analyze the demographic responses to the agricultural land use change in the Manya Krobo District.

1.4 LITERATURE REVIEW

1.4.1 POPULATION AND GEOGRAPHY

Population is gaining increasing prominence in geography. According to Wrigley, the consideration of the distribution and density of population is often a starting point in many

geographical studies or discussions, a finishing point in others and occassionaly it plays both roles. He points out further that

> "We have frequently referred to maps showing densities of population; to general models of population distribution in space; to studies of the relative rates of the growth of settlements of different sizes; and to questions like rural depopulation" (Wrigley, 1967).

This growing importance of population in geography is equally expressed by other authors in different ways. Trewartha, for example, argues that population is the point of reference from which all other elements are observed and from which they all, singularly and collectively, derive significance and meaning (Trewartha, 1969). Preston James also contends that the irregularities in the distribution of mankind over the earth and the differences from place to place are facts that underlie all studies in the Social Sciences including Human Geography (James, 1954). To some other people, population is the very core of reference for geography as a whole. Population distribution can explain any economic activity and its consideration should be the study and analysis in Human Geography (Trewartha, 1953). Others, however, argue equally convincingly that population has wider implications than those stated above. Swinburne (1924), for example, considers population pressure as the basic factor in which resides problems of development, and to Myrdal (1938) the population factor is even a threat to peace.

Population issues, however, do not exist in isolation. Quite commonly, they inter-relate with other variables like agriculture, industry, transportation, trade, administration and politics. For

better understanding of the population issues, there is the need to review the literature on these relationships.

1.4.2 THE POPULATION-AGRICULTURE RELATIONSHIP

(i) POPULATION GROWTH AND AGRICULTURAL INTENSIFICATION/CHANGE

The relationship between population growth and agricultural change or intensification is a popular topic for discussion among scholars of the Social Sciences, researchers, planners and policy makers. According to Boserup,

> "Ever since economists have taken an interest in the secular trends of human societies, they have to face the problem of the inter-relationship between population growth and food production. On the one hand, we may want to know how changes in agricultural conditions affect the demographic situation; and conversely population change upon agriculture" (Boserup, 1965).

In the view of Boserup, to ask the first of the two questions is to adopt the approach of Malthus and his followers. The reasoning of these classical writers is that the supply of food for the human race is inherently inelastic, and that this is the main factor governing the rate of population growth. Thus, to Malthus and neo-Malthusians, population growth is seen as the dependent variable determined by the proceeding changes in agricultural productivity explained in terms of extraneous factors such as technical invention and imitation. In other words, for those who view the relationship between agriculture and population in this essentially Malthusian perspective, there is, at any given time, in any given

community, a warranted rate of population increase with which the actual population increase tends to confirm.

Specifically, the Malthusian theory states that there is the belief that it is a natural law that all populations, at all times and places, unless checked deliberately, tend to go on expanding until they reach the limit of subsistence, after which they are kept in check by "vice" and "misery". This theory was propounded in 1798 by Rev. Thomas Robert Malthus in his "Principles of Population" (Clark, 1967). In the view of Malthus, population tends to increase in geometrical progression or exponentially (1, 2, 4, 8, 16, 32, 64). The growth of agricultural productivity, on the other hand, he claims, could only be in the arithmetical progression - 1,2,3,4,5, (Llewellyn-Jones, 1975). Unfortunately Malthus gives no evidence to support his claims. He bases his theory on two observable facts and a questionable deduction. He first states that food is necessary for the existence of man. He further states that "the passion between the sexes is necessary and will remain nearly as in the present state". It is from these indisputable facts that he makes his rather questionable deduction that "the power of population is infinitely greater than the power of the earth to produce subsistence for man". Malthus further estimates that population could double every 25 years provided no factor checks its growth, but food production would only double in the first 25 years. He concludes that it is the race between population and food supply which helps to keep down the standard of living and gives rise to famine, pestilence and war. Since these

are inevitable, he claims, man can never be perfect. He advocates late marriage and sexual abstention before marriage as preventive checks. He also argues that the poor marry early and have large families, and these increase the rate of population growth and hasten misery which, as a churchman, he could not tolerate (Llewellyn-Jones 1975, p.41).

Malthus's book was described as "a wild success" by some of his contemporaries. It was published at a time when the small land owners and shopkeepers of England feared that the revolutionary ideas being propagated in France would infect the labouring poor of England and that property ownership would be in danger. Malthus therefore did not only deny the perfectibility of man; but had also defended the principle of private property in no uncertain terms. He spelt out clearly the lot of the poor who were poor because of divine design and because of defects in their character. None of them should marry until he could support a family.

It should be noted that Malthus's theory was not based on empirical evidence, but rather on his concern that the status quo of his time should remain inviolate. In the opinion of Clark, the theory conflicts with empirical evidence, both geographical and historical (Clark, 1968). Llewellyn-Jones (1975) thinks Malthus ignored not only the technical advances in food production which were accelerating, but also emigration to the empty lands of North America and Australia. He, however, said in defence of Malthus that both geographical and historical knowledge in 1798 were far limited than they are now.

Refuting Malthus's theory of geometrical rise in population, Gini (1930) formulated a theory of cyclical rise and fall of population. He believes that population does not rise to the limits of food supply to be cut off by want, but rather that a biological law controls the growth of population. He cites as evidence many populations that started to decline before they reached the limit of the means of subsistence (Hatt, 1954).

Though Malthus's theory has been stimulating, it has failed to gain universal acceptance. It has been severally criticized by both some of his contemporaries and many modern scholars. Yet his theory has come to be regarded as a point of departure in the search for the relationship that exists between population and agricultural land use. He set the stage for modern contributions to the debate.

An alternative model to that of Malthus has been developed by Boserup (1965), a Danish economist who has experience as a research worker for the United Nations Organization in several Less Developed Countries (LDCs). She asserts that rather than seeing population growth as determined by increases in food supplies, it is population growth that determines agricultural change. She does not refute Malthus's perspective outright. She rather argues that the theory of Malthus is only one approach to examining the relationship and claims that a better and a more realistic approach should be the opposite; that is, the main line of causation is in the opposite direction where population growth is regarded as the independent variable which in its turn, is a major variable

determining agricultural development. She argues that in many pre-industrial societies, population growth serves as the main stimulus to change agricultural techniques and so increase food production. Agricultural development is therefore generally caused by population trends and not the other way round.

Basing her investigations on a range of land use systems which she classified on the basis of their intensity of production measured in terms of cropping frequency, she identified five different intensities of agricultural land use as recognizable in many parts of Africa, Asia, and Latin America. These are as follows:

(a) Forest Fallow Cultivation, where plots of land are cleared in the forest each year, cropped for a year or two and then left fallow long enough for the forest to regrow on the cleared areas. This implies a fallow of at least twenty-five years and possibly as long as a hundred years.

(b) Bush Fallow, in which the process is similar to forest fallow but the fallow period is much shorter (normally six to ten years) so that the vegetation which develops on the cleared land is not forest but bush with possibly a few young trees. These first two groups are at times jointly described as shifting cultivation systems.

(c) Short Fallow Cultivation, in which the fallow period is only one or two years so that only wild grass is likely to colonize the cleared area.

(d) Annual Cropping, in which land is usually left uncultivated for several months before harvest and planting - period which can be seen as fallow period though it is not normally so described.
(e) Multi-cropping, in which plots bear two or more successive crops each year so that cropping is virtually continuous.

Boserup points out that during the twentieth century when population has increased, there has been a change from less intensive to more intensive systems of cropping in many parts of Africa. Consequently, in some areas, forest-fallow cultivation has gradually changed to bush-fallow cultivation or even to more intensive systems. In essence Boserup's hypothesis outlines increasing frequency and intensity in the use of land as a response to the increasing needs of growing population. Commenting on Boserup's theory, Khaldor (1965) stresses that her main thesis is that contrary to the prevailing view, primitive communities with sustained population growth have better chance of getting into a process of genuine economic development than stagnant or declining populations.

In support of Boserup's model, Clark (1968) observes that population growth has taken place and will continue to take place because of improvements in medical knowledge and practice. He then states that this population growth brings economic hardship to communities living by traditional methods of agriculture and postulates that it is the only force powerful enough to make such communities change their methods of food production. He emphasizes that there are times when population growth does threaten to

overtake the "means of subsistence" as they are understood at that time and place, and consequently the population growth itself provides the necessary stimulus that induces the community to change its existing method of production.

He explains that development in agriculture calls for investment but a rising population considerably reduces the real burden per head. He then further postulates that it is not until a certain critical level of population density has been reached that the construction of towns becomes economically possible; and that it is only with a dense population that a system of regular transportation of food, without which a town cannot live, can be organized without absorbing a large share of the labour force. He remarks that the famines frequently recorded in medieval times were more likely to have been due to under-population of agricultural villages. He observes that lucerne and turnips that were known in the ancient world went into disuse when European population densities were low; but reappeared later where densities were particularly high as in the Flanders. Here extensive cultivation of turnips reappeared as early as the thirteenth century. To Clark, it is rapid population growth that is the principal motivation which brings about extensive clearings for cultivation; drainage of swamps for farming and the introduction of improved crops and manures at certain periods in history. He claims that it is these agricultural activities that historians tend to describe as "agricultural revolutions" though they fail to trace their origins to population increases (Clark, 1968). To Clark, therefore,

agricultural revolutions are preceded by periods of rapid population growth and are therefore the consequence of population stress.

French history is also often cited in support of the Boserup thesis. France began to restrict the growth of her population well before the eighteenth century while the population of her neighbours continued to increase. Now a number of French historians blame the lack of population pressure for the comparatively slow progress achieved by the French in agriculture and industry (Clark, 1968; p.135).

The shortcomings of Boserup's thesis include the fact that she bases her argument on economic conditions giving insufficient attention to the influence of the physical environment and social organizations including traditions, practices and values. She thus dismisses the idea that agricultural systems are adaptations to the natural conditions and favours the idea that they are the result of variations in population density.

Though Metzner (1982) concedes that Boserup's work has been particularly stimulating, he contends strongly that there is by no means any agreement as to the causal weight of population pressure either upon agricultural systems or agricultural intensification. His observation is that even under an itinerant type of agriculture, population densities of several hundred persons per square kilometre can be found which have led neither to the destruction of the environmental base nor to decreasing yields. He cites Central Sikka on the Isle of Flores, Indonesia, where he has

conducted investigations into "Agriculture and Population Pressure" as a case in point. His findings lend support to the observation that the southern flanks of Central Sikka are strongly disadvantaged ecologically. Much more labour has, as a result, to be invested in order to make a living. It was therefore the environment rather than the population density which might be considered as the determining factor of labour intensification. According to this perspective, the environment has to be thought of as forming certain threshold levels which determine the minimum labour input necessary for making the land productive for home needs.

Metzner therefore holds the opinion that Boserup's model could not be proved in Central Sikka. He agrees with the suggestion that Boserup appears to ignore environmental constraints and asserts that many environments require special investment if they are to be made productive. It is to be noted however that Boserup does not ignore the influence of the environment completely in the statement of her thesis. She makes the point that "when increasing population density makes it necessary to change the pattern of land use in a given territory, the changes are likely to be made in a way which takes account of the differences in the natural condition" (Boserup, 1965; p.57).

Metzner also identifies institutional hindrances, including land tenure, as the main factors that explain the situation along the south coast of Sikka. He claims that these factors have prevented the invention or adoption of new agricultural techniques.

From the situation on the southern flanks, Metzner finds it permissible to hypothesize that once a population becomes settled in a given area and subsequently increases in numbers, it tries to work the land as intensively as possible thereby enabling it to remain in the same locality. He adds that migration is resorted to only after intensification has taken place. He finally concludes that there is no clear relationship between population density and intensification of agricultural land use. Whereas permanent cultivation is found along the northern littoral and in a few isolated spots on the saddle of Nita, these areas, by no means, coincide with those of the highest density. He comments that despite the non-concurrence, population increase, particularly since the 1950s has caused fallow periods to become significantly shorter. While the length of the fallow has been shortened, however, the cropping period has not been modified (Metzner, 1982).

Other participants in this general debate include E. De Vries, B.N. Slicher and Simkins. According to De Vries (1965), there has always been a very close relationship between the productivity of land and the density of the population. In the hunting period, densities were exceedingly low. In the Middle Bronze Age in England , shifting cultivation became the main form of agriculture with the slash and burn method. The stone axe and fire were the main agricultural tools. Such systems invariably required that periods of cultivation were interrupted by long periods of fallow.

He observes that productivity of the land is not only a function of soil and climate, but also of the technical level of

agriculture. In the pre-scientific period, there came a transition from gathering to harvesting; for instance, from collecting products of nature to products of culture. Irrigation which marked the transition into permanent cultivation was the second revolution after shifting cultivation. It added water as a main agricultural complement and, in the long run, replaced the fire. Irrigation greatly increases the cropping capacity of the land.

De Vries cites the Island of Java where population pressure became felt after 1880 as an aftermath of great loss of income from cash crops. The peasants responded by adopting a double cropping system on irrigated rice fields in the dry season. Corn, peanuts, cassava and soyabeans became the most important second crops. He then observes that whenever improvement of irrigation or drainage becomes necessary and profitable, the demand can be seen as being induced by population pressure. He adds that heavy investments, if mainly in labour, are rational only in view of rapidly expanding demand. If demand is not rapidly expanding, smaller improvement will be more profitable.

Slicher also says that in Medieval Europe, technical improvements in agriculture were achieved through the circuitous way of increasing demand from the non-agricultural population leading to increase in prices of food and fibre. These prices motivated farmers into diversification, intensification and land reclamation. It should however be noted that expanding demand is not necessarily a consequence of large population. It could be a function of increasing purchasing power (De Vries, 1965). Simkins

on the other hand is of the opinion that a large part of the social and economic deprivation of the underdeveloped countries is only indirectly a product of population numbers and would remain even so if population size were to be sharply reduced. For the whole of the island group of the Philippines, the population density was 38 persons per square kilometre of cultivable land. The latter term being defined as the total area in crops lying idle or in permanent pasture. This density, combined with the nature of the terrain and prevailing land practice, had produced a temporary, if not permanent, deterioration of the land base. Nearly 40% of the land surface of the Philippines had been subjected to serious erosion.

The increasing concentration of people on cultivable land, coupled with the reality of threat of declining land quality, is all the more disturbing in the Philippines where two-thirds of the labour force is dependent on agriculture for livelihood (Zelensky, 1970). He then hypothesises that several responses are possible to increasing numbers of people on the land; including intensification of land use which implies a greater capitalization of agriculture; reduction in levels of living exemplified by increasing tenancy, farm fragmentation, under-employment, and outmigration either to cities or to frontier agricultural areas. Although the various responses to population pressure occurred simultaneously in the past, one could suggest that the build-up in densities in the Philippines was, at first, largely accommodated by gradual reduction in living levels; followed later by increasing colonization of empty areas. He concludes that with the

progressive exhaustion of pioneer lands, the Philippines must now emphasize intensification of land use in order to avoid further deterioration of living conditions.

So far the literature review has been general with examples from outside Africa. The review now focuses on Africa and Ghana with specific examples.

(ii) POPULATION GROWTH AND AGRICULTURAL CHANGE IN AFRICA: WITH SPECIAL REFERENCE TO GHANA

There are divergent views on the relationship between population growth and agricultural change in Africa. Van de Walle (1975) for example observes that "even though the shortage of land is not a general problem in West Africa, over-population in the classical sense, namely that diminishing returns are setting in, exists in many areas". Hance (1968) has also indicated that the following danger signals are all suggestive of population pressure in Africa.

(1) Declining soil fertility, soil deterioration, degradation, outright destruction often associated with a shortening fallow period, or with overstocking and overgrazing.

(2) The use of excessively steep slopes.

(3) Declining crop yields, a trend towards some soil-tolerant crops such as manioc.

(4) A breakdown of the indigenous farming systems.

(5) Food shortages, hunger and malnutrition.

(6) Dispute over land, land fragmentation, excessively small holdings, and landlessness among the rural population.

(7) Some type of out-migration.

(8) Unemployment and under-employment in the rural and urban areas.

He however concedes that population pressure may exist at high or low population density depending on the carrying capacity of the land (Hance, 1968).

Church does not see population growth in Africa as a function of agricultural intensification but as the result of European intervention which ended tribal wars, minimized tropical diseases and improved transportation to bring relief supplies in times of famine (Church, 1980). Similarly Hance sees as the most potent explanatory factor for the existence of well-marked population nodes in West Africa the formation of more or less powerful empires, kingdoms, and chiefdoms whose coherence gave political and economic strength to their regions (Hance 1975). Caldwell, on the other hand observes that "both population growth and socio-economic change have become increasingly rapid in Tropical Africa in the course of the present century", and concludes that "each affects the other" (Caldwell, 1975). Thus, to Caldwell, the relationship between population and socio-economic situations is not uni-directional but multi-directional.

Gleave and White (1968) made an independent investigation of the relationship between population density and agricultural system in West Africa and found it valid to put forward the idea that population pressure can be due to increasing density.

Prothero (1933) has developed a comprehensive model of population-land relationship which sets out its characteristics and components, identifies its phases and processes through which the phases are developed and linked with one another in Africa South of the Sahara (Appendix 1). Prothero believes that the nature of agricultural conditions in West Africa makes it easy for such a model to be applied in a study of the relationship between population and agriculture. The frame envisages a development along a continuum from traditional to modern society, from an extensive to an intensive form of agriculture and from fluid to fixed mobility circumstances. These characteristics are not absolute, thus the population-land relationships are dynamic and changing. Population is clearly an important variable in the evolution of agricultural systems. The phases in the development continuum cannot be clearly distinguished from one another in practice. This continuum occurs in the fullest sense from pre-agricultural predatory use of land to semi-permanent or permanent cultivation.

Not only do intervening phases merge, it is also possible for more than one to be represented, as in the concentric zoning of land use around rural settlements. Under this system, the inner zones are most intensively used and are manured to maintain fertility. Progressing outward, the intensity of use decreases and fertility is maintained by increasing lengths of fallow.

Crop changes occur not only in the crops themselves but in the purpose for which they are grown too. When emphasis is placed on

providing cash crops, both for food and for export, the importance of the subsistence crops usually declines. These developments are closely linked with the extension of exchange systems at local, regional, national and international levels.

Gleave and White (1968), in their study on population density and agricultural systems in West Africa, observed that there is evidence to suggest a connection between population density and agricultural practices and that the practice becomes modified as density changes. They tried to explore the effects of increasing population upon man's methods of using the environment through the medium of his agricultural systems. They observed that all West African countries are characterized by an acute imbalance between land resources and population distribution. Between 1948 and 1960, the population of Ghana expanded at an annual rate of 4.2%. They claimed that the population was growing rapidly and unless action was taken to accelerate economic progress, this increase would mean added unemployment, under-employment, malnutrition and misery. To them, shifting cultivation was found only where population densities were low, "usually less than 25 persons per square kilometer". Generally, rotational bush fallowing is practiced where population densities are higher, but increasing population density eventually reduces the length of the fallow periods until the practice can be classified as semi-permanent or permanent.

Benneh estimates that the critical density has been reached in food crop land use in many areas of the closed forest region in Ghana as a result of population increase and that it has become

imperative to introduce improved methods of cultivation such as the growing of leguminous plants and their use as green manure (Benneh, 1971). Ofori investigated land tenure interactions and land use patterns in Ghanaian agriculture and pointed out that in the Anlo area where land is scarce and population is dense, intensive cultivation is the rule; with each farmer trying to get as much as possible from his small holding. Here there are three farming seasons a year under heavy manuring and irrigation with other crops grown between the seasons (Ofori, 1971).

1.4.3 RELATIONSHIP BETWEEN POPULATION, LAND TENURE AND FALLOW SYSTEMS

Land tenure implies the assertion of the individual or group rights over land. According to William Allan, it is one of the most ancient of human institutions. He added that increasing population and the vast land area required to support hunting and food-gathering economies must have given rise to the concept of exclusive rights at a very early stage of human history. A group inherited a land and held it exclusively. The group might permit outsiders to use its land but trespass was forbidden on pain of sorcery or death. Among the living Bushmen of the Kalahari, the pattern remains intact. Each group has specific territory which it alone may use and its boundaries are rigidly respected. With the advent of agriculture, the primary exploiting unit changed from the band to the single cultivating family. The rights of the cultivating family became entrenched in the area of actual cultivation but tribal and group rights over land, in general,

persisted. This type of situation is commonly referred to as communal tenure. It is communal in the sense that communities or those who act in trust for them, exercise rights of administration and control, but there is a firm underlying stratum of individual right in cultivated land. Communal ownership and exploitation of wild product, fishing waters and pastures, are much more clearly marked.

The emergence of civilization with large political units, and the concomitant social and economic problems brought all sorts of innovation and experiments in agrarian organization in the relationship between the individual, the land and the community. From this emerged the concept of private ownership of land (Allan, 1969). In the Manya Krobo District, communal and private land ownership co-exist.

Dorner (1964) observes that land tenure institutions are part of a larger institutional system and that they are important in the development system. He claims that without such a system, there is chaos; associated living in civilized society disappears and reverts to that condition of war of all against all where the life of man is solitary, poor, nasty, brutish and short. He asserts that land tenure institutions articulate the legal and contractual or customary arrangements whereby people in farming gain access to productive opportunity on the land. To him, these tenure arrangements determine the ability of individuals to gain access to these opportunities and define, in part, the nature, dimension and

future security of such opportunities. They also determine the pattern of income distribution in the farming sector.

According to Ofori it is valid to postulate that there are correlations between land tenure, productivity and income distribution in agriculture in any country. Any research into land tenure and land use patterns must examine this postulate and establish what the correlates are. It is necessary also for a proper evaluation of tenure interactions to distinguish between customary tenure and modernized tenure. He continues that land tenure systems, broadly conceived, define the relation of man to man in the use and occupancy of land.

In more specific terms, land tenure systems are the customary, legal or otherwise institutionalized relations between government, society, group and the individual regulating the ownership and control of land and the rights and duties accompanying such relations (Ofori, 1971). According to Parsons, "A system of land tenure is a systematization of the rules which function by specifying what different classes of persons may or may not do; must or must not do; with reference to the occupancy, use, abuse or disposition of land" (Parsons, 1970).

In terms of agricultural practices, according to Ofori, tenure systems can and do shape the production structure and therefore the land use patterns. By production structure is meant: "the nature, type and 'modus operandi' of the actual production process in direct relation to the size, location and shape of the production unit and its internal organization and management" (FAO/UN, 1970).

Allan comments that the varying relationships between men and land, which tenure implies, have a strong bearing on the productivity of agriculture and the problems of development. The way in which these problems and their solutions are perceived also varies greatly from country to country. He considers the situation within the framework of four groups of countries at different levels of economic development and the varying forms of land tenure;

(1) developing countries with communal forms of tenure;

(2) developing countries with private ownership of land;

(3) economically advanced countries with private ownership of land;

(4) countries with centrally-planned economies.

He observed that in general, traditional systems of agriculture depend, for the maintenance of fertility, on the period of fallow in one form or another. Other forms of fertility maintenance are also employed, but the fallow is normally an essential element of the system. The duration is enormously variable. It is determined by the environment and the character of the soil; its durability under cultivation, the rapidity with which fertility is restored and the condition of the fallow. In inter-Tropical Africa, there are vast areas of ferallitic feruginous tropical and weakly developed soils of poor durability and very low regenerative capacity. For this reason systems with long fallow periods are prevalent. But there are also limited areas of entropy

soils of high agricultural value and rapid regenerative power. On such soils, very short fallow periods and virtually permanent cultivation systems are the rule. In the cultivated parts, rights vested in the individual are dominant but over the fallow, communal rights are strongest. Quite commonly, resting land is identified with the village or lineage rather than the individual who previously cultivated it. This may be of practical significance while there is sufficient land, but when a state of over-population is reached in the sense of an excess of population over what Allan terms the optimal density; or when cash cropping, or, as in some cases, the introduction of the plough has produced similar effects, private ownership is resorted to.

With reduction of the fallow, fertility declines and yields fall, more land must then be cultivated. This further reduces the fallow and the rate of degeneration increases until a base of fertility is reached. Because of this feature of land tenure, the system is, in effect, self-destroying once the critical population density has been exceeded.

In the case of short fallow systems with a small production of resting land, the fallow disappears very rapidly under population pressure. Continuous cultivation is possible, at least, for a good many years on the strong and fertile soils associated with these systems and when this stage has been reached, the individual rights inherent in the cultivated land becomes apparent. This system of decay was noted as a very remarkable example of "customary individualization" of tenure to a high degree in the greatly

overcrowded Kikuyu reserves of Kenya where it facilitated the registration of individual titles (Allan, 1969). In the Manya Krobo District it is first individual land ownership which may change to communal holding on the death of the original owner.

According to Prothero, where there is ample land to meet all requirements, traditional communal organizations function successfully. Individuals do not hold rights to specific areas nor are there permanent demarcation of holdings. But as demand for land increases, communal holdings eventually are replaced by individually held areas with specific values. Land may be transferred by pledge, rent, lease or sale and permanent demarcation of holding becomes necessary. Within one agricultural community, both the traditional and the more modern forms of land organization may operate depending on the kinds of land available. In the Manya Krobo District, individuals hold rights which are permanently demarcated.

Writing on "Land Tenure, Population and Food Supply", Allan notes that, in general, land tenure systems per se are neutral in relation to productivity; but the forces that give rise to agrarian decay operate through them. The most powerful of these forces, he observes, is population pressure. In long-fallow systems under communal tenure, population pressure leads to reduction of the fallow and decline in fertility in family small holding systems with private ownership; to intense sub-division and fragmentation of land in landlord-tenant systems; to an increased rent spiral in large estate systems; to re-allocation of land and excessive

subdivison in collective and co-operative systems; and to hidden subdivisions. No tenure system can resist the effects of this force. Those of developed countries appear to do so only because industrialization and diversification of their economies have diverted pressure of population from the land.

Allan notes further that in most of the less developed countries, population growth is high and the ratio of non-agricultural employment to that of the work force is decreasing. Once the critical point has been passed, the agrarian structures crumble under the impact of continuing pressure of population on the land. In these circumstances, population growth itself produces conditions which make the problems of agricultural development and food supply almost despairingly difficult. This is one of the reasons why agriculture has so often failed to play the part it should in the transition from stagnant to expanding economies (Allan, 1969).

1.4.4 AGRICULTURE, TERRITORIAL EXPANSION AND MIGRATION

Hance (1970) makes the observation that pressure on the land may lead to an expansion of the tilled area or stimulate intensive land use practice. Considering increase in agricultural production, Hodder (1980) says that it applies to both its areal extension and intensification. The areal extension of agricultural land, or agricultural colonization, normally has one or more of three aims:

(1) To increase the total food production.

(2) To relieve population pressure on source areas.

(3) To encourage peopling and economic development in receiving areas.

Thus, in Indonesia, officials support agricultural colonization in the islands outside Java to increase the total amount of food produced within Indonesia, to relieve population pressure in Java, and, finally, to assist the development of the more sparsely peopled islands. Although pioneer agricultural settlement may possibly be successful in raising the total amount of food produced within a country, and is sometimes successful in promoting economic development in new areas, there is no evidence that the redistribution of population for agricultural colonization in the Tropics has anywhere appreciably lessened population pressure in the country of origin. The numbers involved have never been large enough over a short period. For example in 1953 the Indonesian Government moved some 50,000 colonists from Java to the sparsely peopled islands chiefly Sumatra and Borneo. Such a figure constituted less than one-tenth of the natural increase in Java during the year.

Furthermore, migration may even increase distress in the area of origin because of its effects on the age and sex structure, for migration commonly involves the younger and the more active male section of the population (Hodder, 1980). This has been demonstrated in Togo where it has been shown that far from relieving population pressure, the out-migration of Cabrais into

central Togo commonly increases distress in the Cabrais country. Of the population present in Cabrais country in 1957, for instance, the female dominance was striking, notably, in the fifteen to fifty-nine age group, upon which the bulk of the farm work relied. This disparity, giving a total sex ratio of 120 females to 100 males, is almost wholly the result of emigration or out-migration (Hodder, 1980). Hodder contends that "taken together", the extension and intensification of agricultural production constitute important measures to meet the demographic-economic problems in Tropical countries. The nature and relative emphasis of these measures must, of course, vary from one country to another, depending on population density and the present pattern and intensity of land use. In densely populated Java, the emphasis is on intensification by various means whereas in Sumatra, the extension of agricultural land is of first importance.

Hodder concludes that the general proportion of land under cultivation has led a number of writers to see the extension of the cultivated area as important means of increasing agricultural production in the tropics. But in practice, the extension of cultivation is rarely an easy or practicable proposition. It is certainly misleading to suggest that there are open spaces - in Borneo, Africa and Brazil, for instance, just waiting for colonists. The extent of the use of the land is never a measure of economic efficiency in the use of the land resources. Moreover, the quantitative land resources are in this context, at least, as important as the amount of land available and still unexploited.

Hodder maintains that soil conditions and a whole complex of economic and social considerations - communications, capital availability, essential skills, and markets - are but a few of those factors which may inhibit successful colonization in an area. Others include the difficulty of the clearing operations in many tropical countries, while land tenure and health hazards in the receiving areas too, are frequently discouraging to prospective migrants. Hodder still stresses that colonists usually demand high standards of economic and social security from the moment they arrive in the area to be opened. He also points out that it is often very difficult to find sufficient number of colonists at a place, for, in few areas population pressure on the land is already so critically severe as to make people unwilling to move away from their traditional homes to these areas (Hodder, 1980).

Hodder recalls that the extension of cultivation must normally involve an expansion into areas of often unproven quality, lying beyond the present settled limits, and further from, or less accessible, to markets. The unknown variables, and so the risks, are therefore greater (Hodder, 1980). As Farmer (1957) emphasized, the decision about the relative value of extending the cultivable land and intensifying production in areas already cultivated requires difficult cost-benefit analysis, and in any case, the whole problem is frequently crucially affected by non-economic considerations. Hodder thinks it might be legitimate to question two assumptions:

(a) That these two complementary means of increasing agricultural production - by extension and by intensification - are normally available in most developing countries of the Tropics.

(b) That an extension of the cultivable areas must necessarily be useful so long as cultivable land remains uncultivated.

"On the other hand", he asserts,

> "it would be misleading to dismiss altogether the extension of cultivated land as a means of increasing total agricultural production within a country" (Hodder, 1980).

Some other writers give this point a great deal of attention. Luggard argues that however much industrialization and intensification of agriculture are preferred as measures to meet the expanding needs and demands of Africa's populations, the next decade or so will undoubtedly see an extension of agriculture into the largely empty land (Luggard, 1927). It has been observed that in Kroboland, the marginal lands on the steep slopes, the leached soils on top of the mountains and the seasonally flooded river banks are being increasingly brought under cultivation. Hodder observes that extension of agricultural settlement may take place largely for political reasons, or in an attempt simply to relieve the so-called population pressure elsewhere.

Writing on "Migrant Labour in West Africa", Church notes that people move from areas of poverty and poor prospects ("push" areas) and that the "push" areas are commonly regions of population pressure (whether densely or thinly peopled), in the savannas. He points out that the migration could be seasonal, long-term, or even

permanent. He then concludes that the absence of the young and vigorous men may impoverish the agricultural practices and reduce crop yield in the community they leave. He remarks that such a phenomenon is well-known in the South African reserves but is also acute in West Africa, especially in Burkina Faso (Upper Volta). He then states that the absence of the young men may also upset the demographic balance, loyalty within families and lead to dependence of the very young and old women upon remittance from the young migrants (Church, 1980, pp.179-175).

Oluwassami argues that the problem of rural development (including improvement in agriculture) has been accentuated in Nigeria by rural emigration or out-migration. Young rural labour, particularly those who have acquired some forms of formal education, have continued to migrate to urban centres in search of wage-price jobs. The consequence of this is that there is shortage of rural labour. This leaves agriculture in the hands of the older non-literate rural population with consequent repercussions on managerial ability and productivity (Oluwassami, 1971). Young school leavers in Manya Krobo even regard farming as being derogatory to their status and thus leave the rural communities for the urban towns in search of employment.

According to Ivanor, during the colonial period in Tropical Africa, the bulk of the hired labour at colonial enterprises were migrant peasants who left their villages temporarily. He notes that at the beginning of the 50s about 75% of the Africans living in the urban regions of Zambia (formerly Northern Rhodesia) had

cultivated plots in the villages. He is of the opinion that migrant system in Africa, South of the Sahara, is created by colonial methods of extra-economic coercion based on the commodity-money relations in the village as was the case in Europe.

To Ivanor, at the beginning of the twentieth century, the peasants, did not want to work for the colonialists, primarily because their basic needs were provided by the subsistence economy. For this reason European capital could not, at least, base itself on the exploitation of hired labour. He cites the report of the British Government Commission of 1903 which stated that the scarcity of native labour was due first, and foremost, to the fact that African native tribes were, for the most part, primitive pastoralists or agricultural communities with exceptional facilities for the regular and full supply of their needs. He then points out further that after the colonial regime was established, the unconstrained pursuit of profit resulted in unlimited exploitation of peasants. The peasants' services prevented them from working on their farms thus preparing the way for the development of the labour migrant system.

Ivanor concludes that, in essence, the existence of regions where subsistence farming predominated and ensured a steady flow of cheap labour to colonial enterprises was vital for the normal functioning of the migrant system. Thus to Ivanor, rural migration in Africa, South of the Sahara, was not the result of population pressure but of colonial exploitation (Ivanor, 1979).

The annual exodus of large members of men to work in the urban areas leaves the African villages without manpower. Cleared and fallow agriculture, however, cannot be effectively practiced without these men because the women and children cannot adequately do some of the jobs, especially the felling of trees or the clearing of new lands. Confirming this view, Allan points out that the absence of men from the villages brings about overcropping. He explains that frequently the women who are left behind are not able to do new clearing for fresh gardens. The old gardens are consequently cropped for longer periods than they can stand; even if fresh land is available (Allan, 1949, p.36). Batten emphasizes the magnitude of the problem of male migration from the African villages in the regions of mass migration when he states that

> "in the 1950s, one-quarter of the able-bodied male population was employed in plantations and mines in East Africa. In this case, about one man in four was absent from the village and incidentally withdrawn from peasant farming".

He estimates that out of 420,000 able-bodied tax-payers in Zambia in 1950, only 128,000 farmed their own plots. At the same time many villages in the northern regions of Malawi were completely without men (Batten, 1960).

Studies in the former Belgian Congo, now Zaire, also showed that in the late 1950s, in the south-eastern regions of Kasai, only 42% of the men aged over 20 lived in the villages and out of these only 30% lived there permanently while 70% regularly left for places where wage labour was used. The Soviet Historian, Kamer, observed that because of massive migration of primarily able-bodied

males from the Congolese villages in the 1930s, 1940s and 1950s, the scarcity of males undermined their economy and caused the disintergration of their social organization which brought about a new wave of migration (Kamer, 1974). Ivanor concluded his study on "Agrarian Reforms and Hired Labour in Africa" by saying that the migration system facilitated depression of land regardless of whether land suitable for tilling was available (Ivanor, 1979).

A 1959 study carried out by the Commission for Technical Co-operation in Africa showed that south of the Sahara, 52% of the 100,000 migrants going to Ghana and Cote d'Ivoire were single, and 85% of the married men had left their wives at home. In East Africa only 1-5% of the migrants in the 1950s left home together with their wives (Hunter, 1963, p.202).

Johnson similarly observed that "in the village economy, women and children perform most of the agricultural tasks while the men are generally absent" (Johnson, 1966).

From the forgoing literature review, emerge the following issues:

(1) That in the relationship between population and agricultural land use, agricultural land use could be an independent variable capable of inducing population change (Malthus).

(2) That in the relationship between the two variables, population could effect agricultural land use change (Boserup).

(3) That there is no clear relationship between population density and intensity of agricultural land use. Instead, agricultural intensification can be explained in terms of environmental

factors and institutional variables, including land tenure. (Metzner).

(4) That productivity of the land is not only a function of soil and climate, but also of the technical level of agricultural land use. (De Vries).

These issues will constitute a broad framework within which the study in the Manya Krobo District will be examined.

1.5. RESEARCH HYPOTHESIS

It has been noted in the literature review that in a rural agricultural community, the two key variables of population growth and agricultural change are multi-directionally functional. The broad hypothesis for the study, therefore, is that in the Manya Krobo District, the causal relationship between population growth and agricultural change is mutual. The specific hypotheses are stated below:

(1) In many rural agricultural communities, where the family forms the source of agricultural labour and prolific child-bearing is a prestige, high fertility among the woman is generally the rule. The hypothesis, therefore, is that women in the Manya krobo District have high fertility.

(2) It has already been stated that at the time the Krobo settled on the Krobo Mountain, they were few; and that with population increase, there arose an increasing need for more agricultural land. Within a century, the Krobo acquired agricultural land

from their Akan neighbours from the Krobo Mountain to the southern parts of the Afram Plains against strong Akan resistance which at times resulted in clashes. The assumption is that it was population pressure that sustained the Krobo land acquisition process. The hypothesis is thus that demographic factors, including population pressure, were the main motivative force behind the persistent acquisition of agricultural land by the Krobo.

(3) Hance (1968) has observed that in Africa, some of the danger signals of population pressure are land fragmentation, excessive small holdings and landlessness among the people. In the Manya Krobo District, these danger signals are observable. Consequently it is hypothesised that the existing agricultural land use phenomena of progressive land fragmentation, excessive small holdings, landlessness and their resultant disputes over land ownership in the Manya Krobo District are the effects of the rapidly increasing population.

(4) Increasing population density eventually reduces the length of the fallow period until the agricultural practice can be classified as semi-permanent or permanent (Cleave and White, 1968); and with the reduction of the fallow, fertility declines and the yield falls. (Allan, 1969). Based on these propositions, the hypothesis is stated that in the Manya Krobo District, the increasing population density is reducing the length of the fallow period.

(5) As a result of agricultural land use changes and decay in the Manya Krobo District, many Krobos have migrated outside their homeland. But migration is a common response to population pressure in rural environments (Grigg, 1976). The hypothesis is therefore that it is the land use change (excessive small land holdings and landlessness) that motivated migration form the Manya Krobo District, especially Upper Krobo.

1.6 BACKGROUND TO THE STUDY AREA

LOCATION AND THE PHYSICAL BACKGROUND

The Manya Krobo District is located in the south-eastern part of Ghana (Fig.1:1). It is made up of the land around the Krobo Mountain north-east of the Accra Plains; a section of the Akwapim Mountain locally known as Agodza; the Pawmpawm Basin; the Aklum Basin and the southern portion of the Afram Plains. Specifically Kroboland, as a whole, is found between 0°25′ west longitude and 0°6′ east longitude and extends from 6°2′ to 6°37′ north latitude (Huber 1963, p.33). The District is bounded by the Akwamu and the Osudoku Traditional Areas in the east, the Akwapim and the Akim areas in the west, the Akim and the Kwawu areas in the north and north-west; and the Shai Traditional Area to the south (Fig. 1:2).

Essentially, the Manya Krobo District falls into three geographical regions, namely: the lowland in the south. This is part of the Accra Plains. Standing on this lowland is the Krobo Mountain (443m). North of this region is the Krobo section of the Akwapim Range 'Agodza' the general height of which is between 330

Fig.1·1 LOCATION OF MANYA KROBO DISTRICT

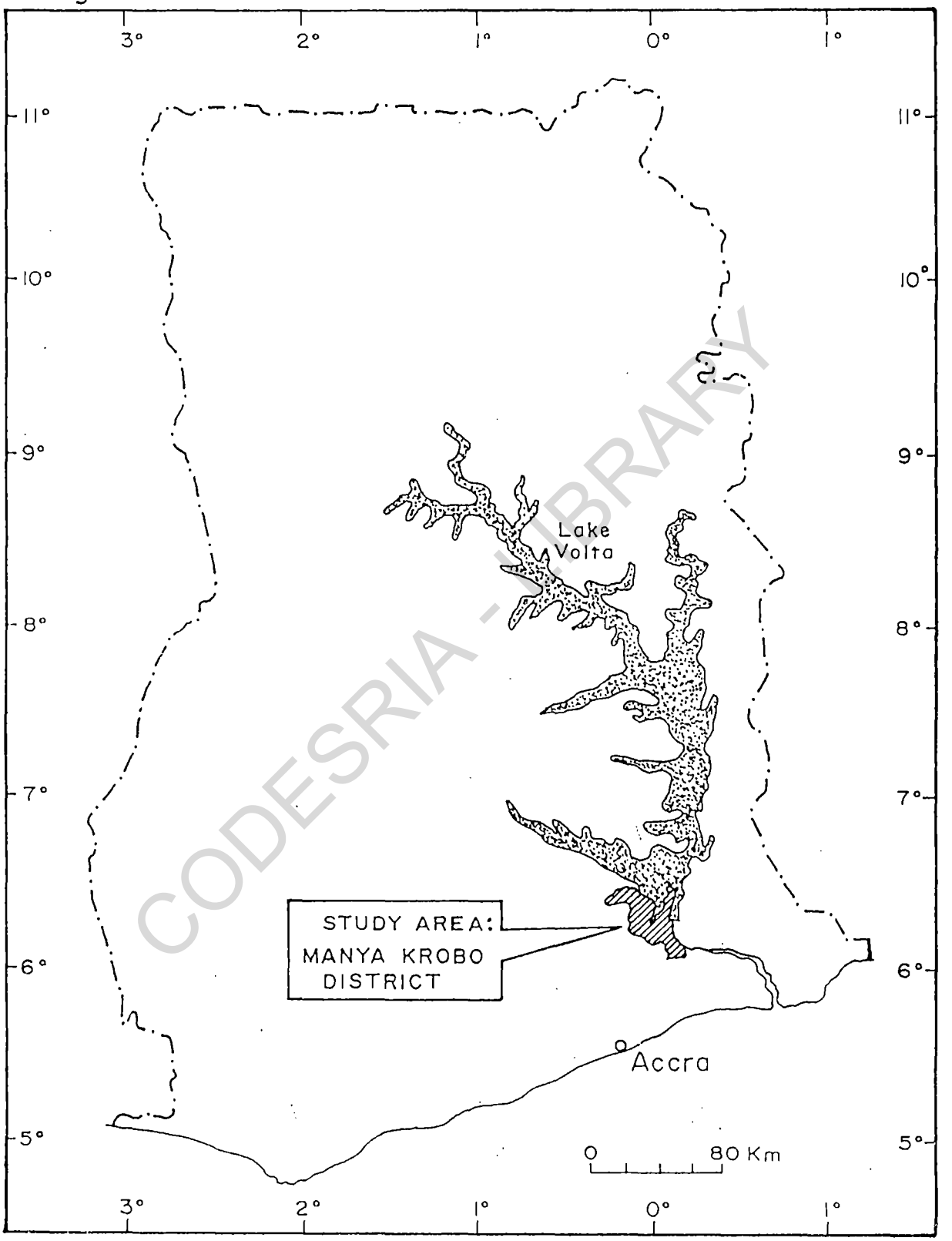
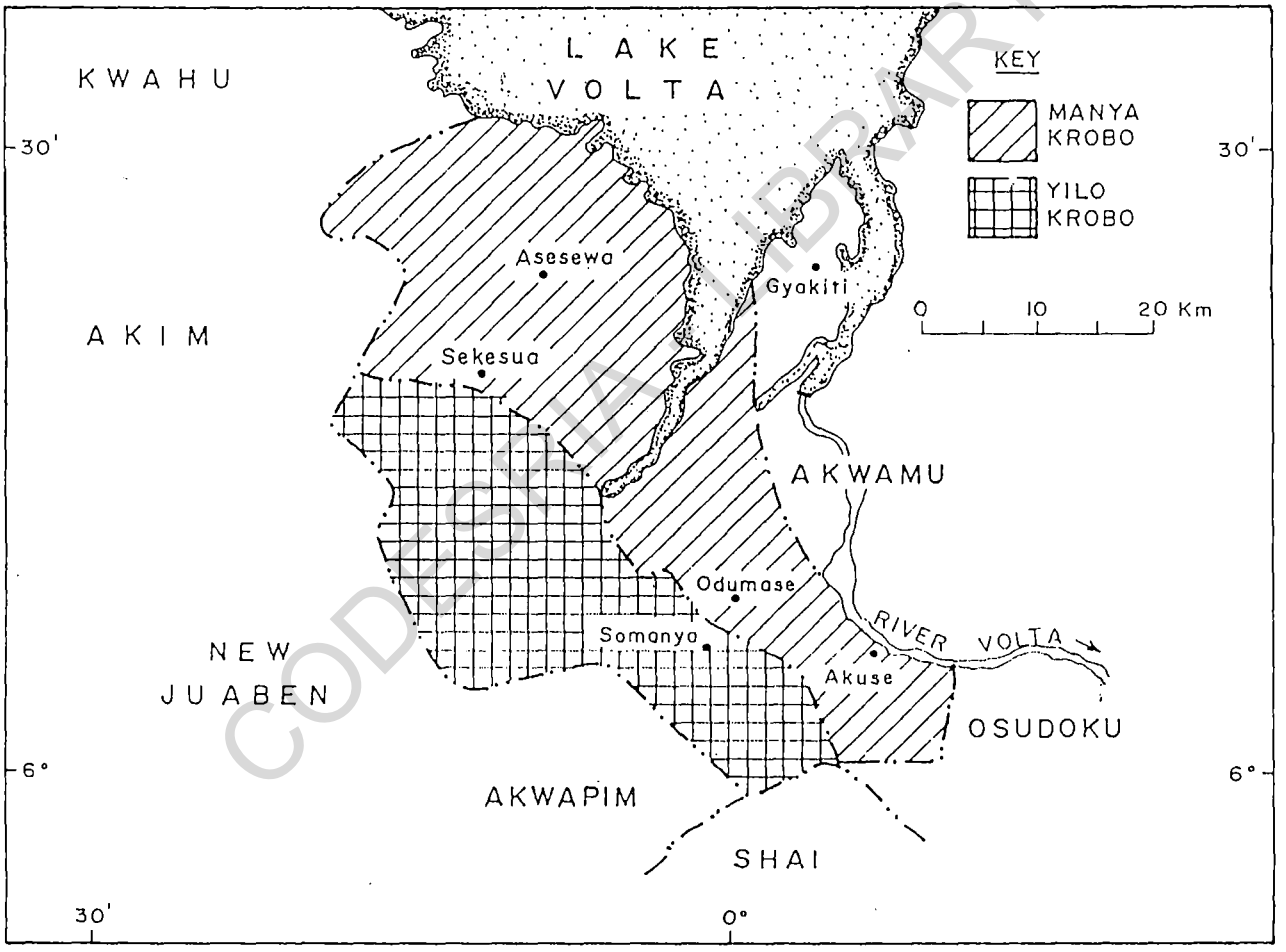


Fig.1·2 THE MANYA KROBO DISTRICT AND ITS NEIGHBOURS



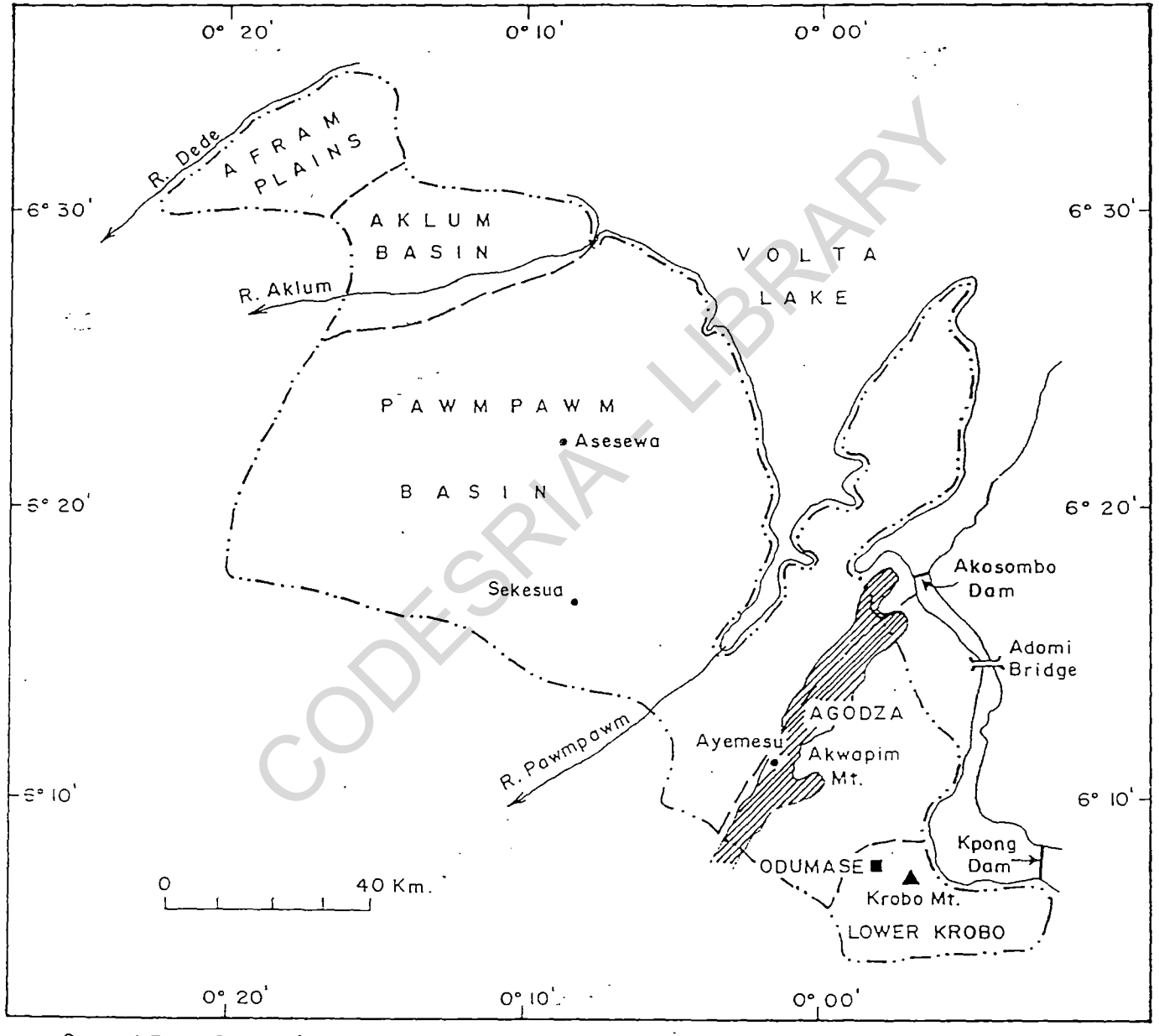
Source: From Student's Fieldwork

metres and 460 metres above sea level (Church, 1980; Brammer 1967). Bordering this region in the north and north-west is the valley and hill country of the Pawmpawm Basin and part of the Afram Plains. Here, heights range between 73 metres above sea level in the valleys and 240 metres on the hills. There are, however, isolated peaks and ranges that reach between 300 metres and 400 metres above sea level (fig. 1:3).

Generally, Kroboland is quite well drained with only a few isolated areas being liable to flooding and being water-logged during the rainy season. There are numerous rivers and streams that provide abundant soil water for cropping. These rivers and streams include the Okwe on the lowland; Ayemesu and Dokosi in Agodza; Pawmpawm, Aklum and Odede which drain the Pawmpawm and Aklum Basins and the Krobo section of the Afram Plains.

The Manya Krobo District has a variety of soil types. On the lowland in the south are a series of soils including the Tachem-Okwe complex, the Akuse complex, the Simpa-Agawtaw complex and the Oyarifa-Mamfe complex. The variety of soils enhances the cropping of a vast range of crops that include rice, vegetables, sugarcane, maize, millet, guinea corn, yams, groundnut and cassava (Brammer, 1966; Soil Research Institute, (CSIR) Map, 1977). On the Agodza (Akwapim Mountain Section), the dominant soils are the Mamfe-Fete complex with soils suitable for the cultivation of maize, yams, cassava, cocoyam, banana, plantain and vegetables. Tropical red soils suitable for maize, cassava, cocoyam, banana, plantain, fruits, cocoa and oil palm are the main soils of the valley and

Fig.1·3 THE MANYA KROBO DISTRICT – PHYSICAL DIVISIONS



Source: From Student's Fieldwork.

hill country of the Pawmpawm and Aklum Basins and the Afram Plains (Brammer, 1966; Gyasi, 1976; Soil Research Institute, 1971).

Kroboland experiences tropical climatic conditions with rainfall all year round. It has double maxima regime with peaks in May-June (locally called "gbonyu") and September-October (gbienyu). The total rainfall ranges from 1000mm on the lowland (Lower Krobo) to about 1450mm on the higher lands (Upper Krobo) (Gyasi, 1976).

Table 1:1 shows the rainfall figures for Akuse on the lowland and Sekesua in the up-country (Upper Krobo) and gives some idea about humidity in the Manya Krobo District.

TABLE 1:1(a): MEAN MONTHLY RAINFALL FOR AKUSE

Months	J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
Rainfall(mm)	22	46	101	122	154	176	64	38	98	133	100	39	1094

Source: The Meteorological Station-Akuse.

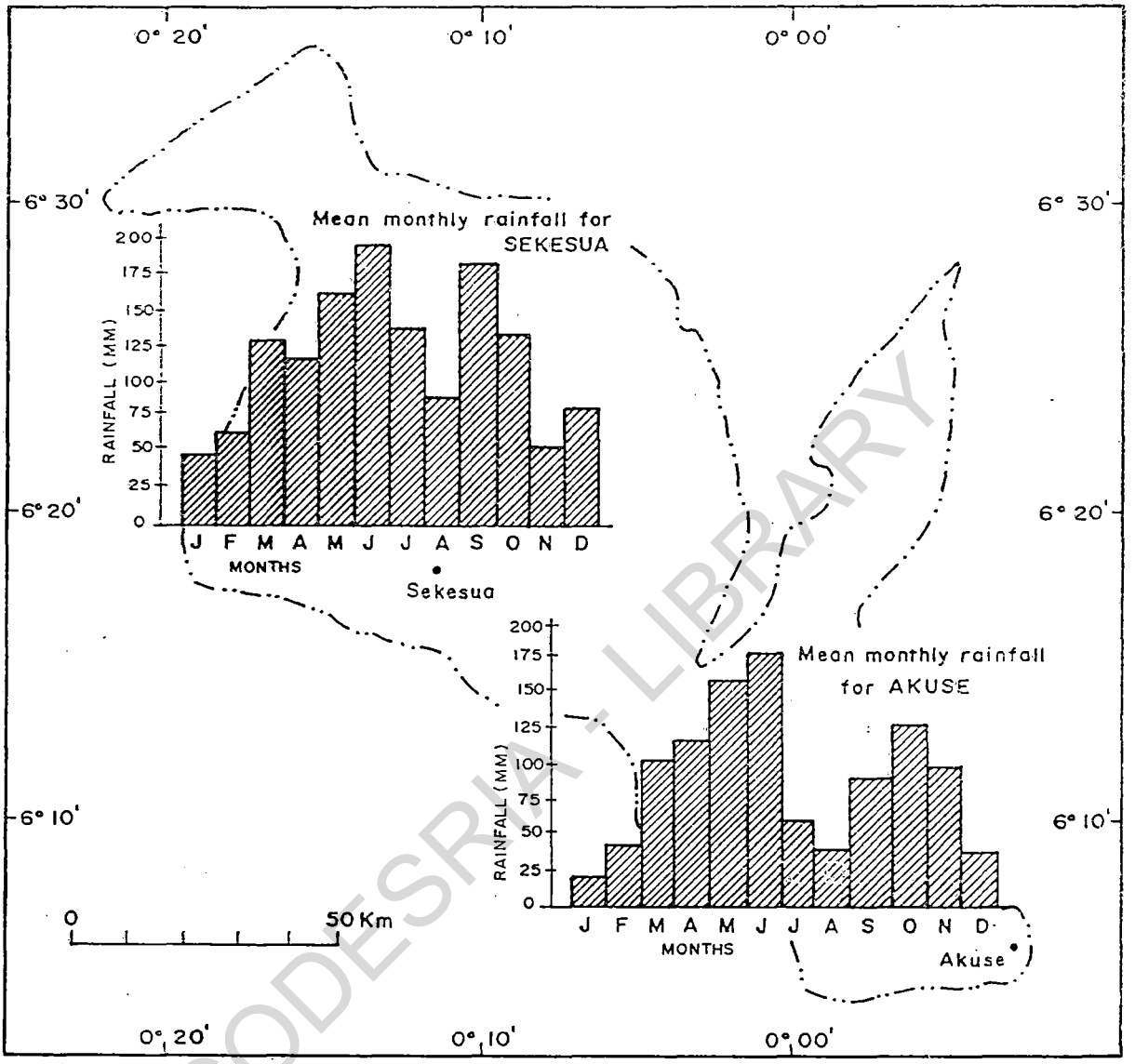
TABLE 1:1(b): MEAN MONTHLY RAINFALL FOR SEKESUA

Months (mm)	J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
Rainfall(mm)	48	60	121	143	162	198	144	88	178	143	53	78	1328

Sources: 1. The Cocoa Division of the Ministry of Agriculture Sekesua;
2. Gyasi, 1971, p 65.

(See Fig. 1:4 for graph representation of the rainfall figures.)

Fig.1·4 RAINFALL REGIMES IN THE MANYA KROBO DISTRICT



Source: From Student's Fieldwork

Map outline – Addo & Ofori, 1989 page 4.

TABLE 1:1(c): MEAN NUMBER OF WET DAYS FOR AKUSE

Months	J	F	M	A	M	J	J	A	S
No. of Days	2.3	2.3	8.2	7.3	10.5	11.7	6.5	5.3	9.6

O	N	D	YEAR
11.5	9.5	3.4	85.0

Source: Ghana Meteorological Department, Accra, Study Report 1949-59.

TABLE 1:1(d): MEAN NUMBER OF WET DAYS FOR SEKESUA

Months	J	F	M	A	M	J	J	A	S
No. of Days	2.4	3.6	7.4	7.6	10.9	13.4	11.2	9.9	12.6

O	N	D	YEAR
12.6	9.0	4.9	103.0

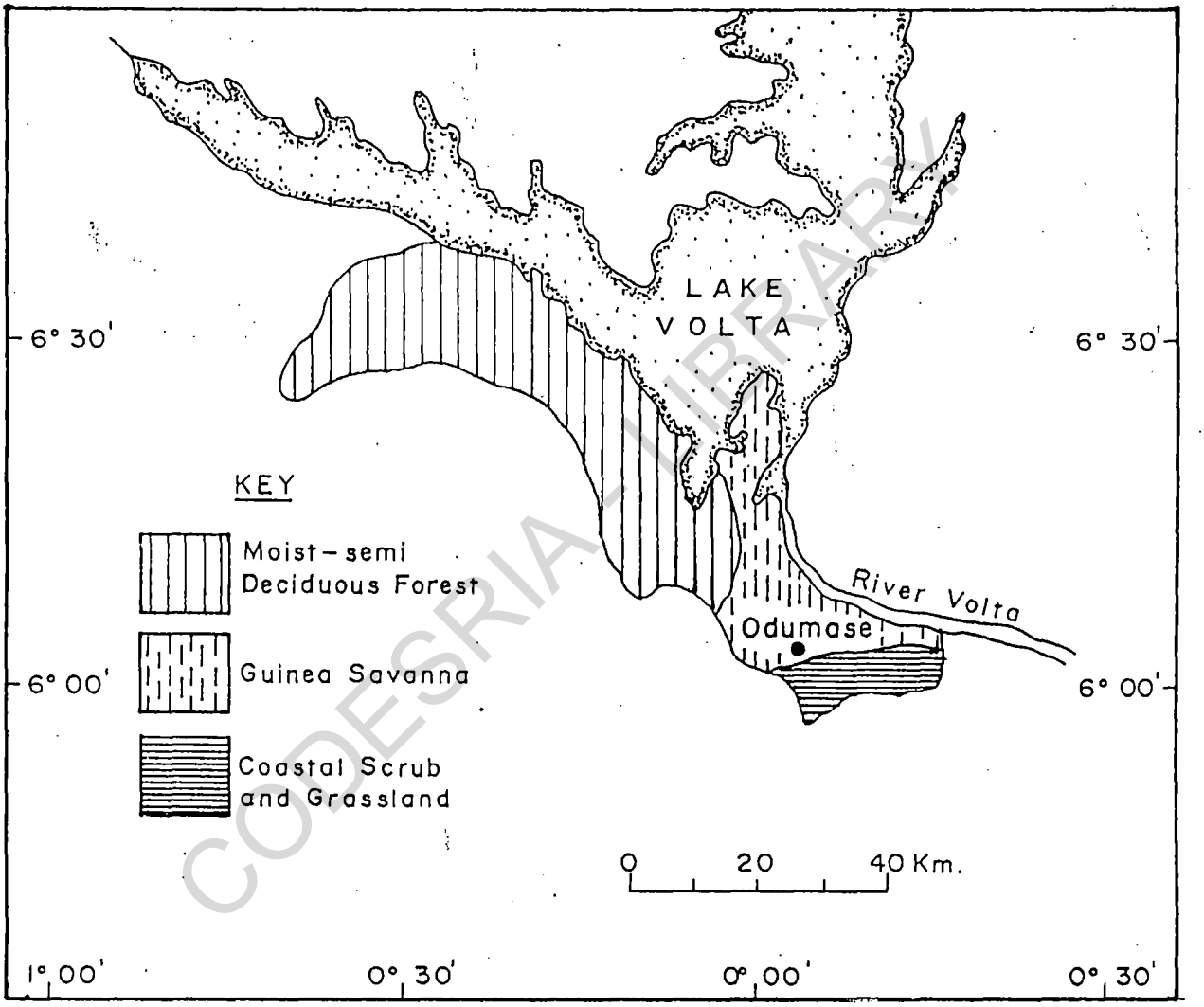
Source: Ghana Meteorological Department, Accra, Study Reports 1949-59.

Kroboland has high temperatures throughout the year. This makes rainfall the most important climatic factor in the farming system.

Basically, the Manya Krobo District falls into two vegetational zones. While the lowland in the south is part of the grassland of the Accra Plains, the upland country forms part of the forest zone of southern Ghana. Between these two vegetational zones, there is a transitional area of thicket and bush, especially at the piedmont of Agodza (Fig. 1:5).

Fig.1·5

VEGETATIONAL ZONES IN THE MANYA KROBO DISTRICT



Source: Dickson and Benneh (1988)

1:7 RESEARCH METHODOLOGY

1:7:1 DATA COLLECTION

Apart from information from already existing work on the Manya Krobo District, much of the data for the study was derived from first hand field investigation, mostly through interview schedules. The interview schedule is the same as the questionnaire but is administered by a trained research assistant. The research assistant is given copious instruction in the extraction of information from respondents and in the interpretation of the questionnaire. Though this mode of data collection is expensive, it is more reliable than the self-administered questionnaire where general indifference to the exercise and inadequate understanding of the questionnaire on the part of the individual respondents could mar the reliability of the data collected. In addition to its greater reliability, the interview schedule option was chosen because many of the respondents in the district are illiterate farmers who would not be helpful if the self-administered questionnaire option were adopted.

The research assistants were selected mostly from Sixth Form products of Second Cycle Schools and Trained Teachers (Post Secondary) in the field. The rationale behind this selection was that such people were assumed to have the right frame of mind and understanding for the content and importance of the work. The selected people were Krobos or people with a good knowledge of the

Krobo language. This was to reduce the problem of translation and interpretation to the minimum.

In selecting the research assistants, a sense of courtesy and experience from previous research work or population census were the guidelines. This was to ensure a level of efficiency. For such efficiency and uniformity of work, a briefing course was organized for the selected research assistants. This was to provide the opportunity to explain the procedure that should be followed. Instruction was also given on how to complete the schedules and an attempt was made to reach some agreement on uniform Krobo translations of the English schedule.

The Manya Krobo District, as a whole, was the main area of investigation. The district was, however, divided into the following sub-regions for more detailed study: Data was collected from both male and female respondents.

(a) Lower Krobo including the Krobo Mountain. This is generally a lowland region which is on the whole below 75 metres (250 feet) above sea level. The region forms part of the north-eastern portion of the Accra Plains. Slopes are mostly between 2 and 5 degrees. Near the foot of Agodza, however, slopes reach 10 degrees.

Standing imposingly on this lowland, is the Krobo Mountain that reaches a height of 330 metres (1100 feet) above sea level (Brammer, 1967). The Krobo Mountain was formerly the home of the Krobo (Klowem - meaning the home of the Krobo).

(b) Agodza (The Krobo Section of the Akwapim Mountains). This region rises steeply northwest of the plain and reaches heights between 300 metres and 460 metres (100-1500 feet) above sea level (Church, 1980).

(c) The Pawmpawm Basin

This is the valley and ridge country northwest of Agodza. The main river that drains the region is the Pawmpawm. The region is the most extensive in the district and it has the greatest number of settlement localities (Huzas). It was formerly a forest region that produced the bulk of the district's cocoa and palm oil.

(d) Aklum Basin

This is the region of the basin of the Aklum River and its tributaries.

(e) The Afram Plains

This region is the part of the larger Afram Plain acquired by the Krobo for farming (Fig. 1.3).

Some of the destination areas of the Krobos who out-migrated were also investigated to find out if the systems of land and settlement patterns have been modified under reduced population pressure. Such destination areas included Kwao Boso and some of the Krobo settlement enclaves in the Akim, Kwahu, Ashanti and Brong Ahafo areas. The neighbouring non-Krobo areas like Akwapim, Akwamu, Akim and Kwahu areas were also investigated in connection with the mode of land purchases by the Krobo and population movement in the past. Here the chiefs and elders were the target of investigation.

In addition to information on the agricultural land use and population situations in the district, the schedules sought information on the socio-economic conditions at the different stages of the history of the Krobo. Population census reports, especially vol. 2 of the 1948, 1960, 1970 and 1984 editions of the Ghana Population Census were generally consulted for relevant information on population figures.

Secondary sources such as those by authors like Odonkor (1971), Azu (1926), Huber (1963), and Odjidja (1977) were equally consulted to crosscheck information from the field and also for "a priori" knowledge before the field work. Other secondary sources used included works by Benneh (1970); La-Anyane (1958); Hill (1961); Field (1943-44); and Gyasi (1975).

There were also personal interviews with the appropriate important personalities in the field. The Konors of Manya Krobo and Yilor Krobo; the Akwapimhene; the chief of Aperade; the Akwamuhene; the Begorohene; the High Priests of Yilor and Manya Krobo and the clan leaders were some of the people contacted.

1:7:2. SAMPLE DESIGN

There are 379 localities and about 16,830 houses in the Manya Krobo District. A systematic sampling design was used to select 500 houses, the heads of which were the target of investigation. First, a list of all the localities, as shown on a map of the district, was alphabetically compiled. Every tenth locality was selected for study (Appendix 2). In every fifth house the head was

interviewed. Necessary adjustments were made to get, at least, ten houses in each locality (Table 1:2). It was assumed that this sample design would reduce bias in selecting the houses. In the destination areas of the Krobo who moved out of the district, Table 1:3 shows the sample design. The sample size for each physical region in the district is shown in the table below:

TABLE 1:2: SAMPLE SIZE FOR EACH PHYSICAL DIVISION IN THE MANYA KROBO DISTRICT

PHYSICAL DIVISION	No. OF LOCALITIES	No. OF LOCALITIES SELECTED	SAMPLE SIZE
LOWER KROBO	24	3	30
AGODZA	16	2	20
PAWMPAWM BASIN	288	31	310
AKLUM BASIN	34	11	110
AFRAM PLAINS	17	3	30
TOTAL	379	50	500

SOURCE: Compiled from student's field note.

In the table, column one shows the various physical regions in the Manya Krobo District while column two shows the number of localities in each region. The number of localities selected for investigation in each region is indicated in column three. In the last column, the number of people to be interviewed in each locality is indicated.

TABLE 1:3: THE TARGET PEOPLE FOR INTERVIEW IN THE DESTINATION AREAS

DESTINATION AREAS	TARGET GROUPS	TARGET PERSONS
FOREST REGIONS IN GHANA	The Krobo Community (Huza) The non-Krobo Community	Dadematse (Leader) Chief
LOWER KROBO	People who migrated from Upper Krobo (Pawmpawm and Aklum Divisions)	Industrial and Commercial workers
AGODZA	People who recently migrated from Upper Krobo.	Dadematse (Leader) The CDRS of the localities Some randomly selected individuals
CITIES/TOWNS	Krobo Communities in Accra, Kumasi, Koforidua and Takoradi	Leaders of Krobo Association Groups Some randomly selected Krobos.

SOURCE: Compiled from student's field note.

In the random sampling, anybody available in the relevant group is the target of investigation.

1:7:3 DATA ANALYSIS

Hagerstrand's diffusion of innovation model is used to examine the spread of land purchase and the "huza" system of farming in the Manya Krobo District. The conditions that aided the spread of land acquisition and the "Huza" system of farming (a) on the part of the Krobo, (b) on the part of the non-Krobo neighbours are critically

examined and conclusions are drawn within the framework of the model.

Flow maps are used to show the direction, intensity and volume of out-migration from Upper Krobo. Correlation techniques are also employed to examine the nature of the relationship between the population factors and the agricultural components. A conceptual schema showing relationships, over time, between population and agricultural land use, is also used. Conflict analysis model is similarly used to examine the conflict situation over agricultural land ownership between the Krobo and their Akan neighbours.

CHAPTER TWO

POPULATION GROWTH, DISTRIBUTION AND CHARACTERISTICS IN THE MANYA KROBO DISTRICT

2:1 INTRODUCTION

Population influences the whole spectrum of human life. According to Hance, the impact of population on economic, social and political development is pervasive, direct and frequently complex. He argues that population size is one important determinant of political power and prestige. It provides one measure of market size and thus strongly affects the economic potential of many individual countries. Population distribution equally has impact on political, social and economic integration and the degree of land pressure which may have developed within a country. It greatly influences the costs and difficulties of providing adequate social and economic infrastructure. Population dynamics, that is fertility, mortality and migration, according to William Hance, influence every aspect of a nation's economy and polity. Population growth has direct impact on economic development. It may increase the size of the market for certain items and the number of operations available for productive output. But rapid population growth tends to increase the difficulty of development in that a substantial part of investment must go to provide the population increment with essentially the same services enjoyed by the existent population (Hance, 1970). Thus, population has ramified impact on many aspects of human life and

endeavour including agricultural land use. A good knowledge of its growth, distribution and characteristics is therefore essential for any examination of the inter-relationships among phenomena in the Social Sciences.

In this chapter, the focus is on the main aspects of the population which influence agricultural land use in the Manya Krobo District. The pertinent components include the growth, distribution and characteristics of the population as they influence agricultural land use in the area. The analysis is based, essentially, on the 1931, 1948, 1960, 1970 and 1984 Ghana Population census reports. Relevant information from the field study is also used to supplement the census reports. Linegraphs, population pyramids, divided circles and distribution maps are incorporated in the analysis to illustrate relevant points and establish findings.

The chapter essentially provides a demographic background for the study.

2:2 POPULATION GROWTH IN THE MANYA KROBO DISTRICT

Table 2:1 is provided for the examination of population change in the Manya Krobo District from 1931 to 1984. In the table, the total population figures for 1931, 1948, 1960, 1970 and 1984 for the district, as a whole, are provided. In addition the crude population increases or decreases; the percentage population changes; and the annual growth rates for the various inter-censal periods are provided. These are to show the general population

growth trends in the district. Corresponding figures for the main towns in the district are also provided to show population trends within the district. The selected towns are Odumase, Kpong, Akuse, Bisa, Manya-Kpongunor, Agomanya and Asesewa.

TABLE 2:1 POPULATION GROWTH TRENDS IN THE MANYA KROBO DISTRICT - 1931, 1948

LOCALITY	DISTRICT	ODUMASE KROBO	KPONG	ASESEWA	AKUSE	BISA	MANYA KPONGUNOR	AGOMANYA
1931								
Population	31,143	1,264	2,906	-	3,658	1,865	847	-
Change	-	-	-	-	-	-	-	-
% Change	-	-	-	-	-	-	-	-
Growth Rate	-	-	-	-	-	-	-	-
1948								
Population	58,573	1,719	2,049	1,448	3,005	997	1,218	90
Change	-	459(+)	855(-)	-	650(-)	868(-)	344(+)	-
% Change	-	35.5(+)	29.4	-	17.8(-)	46.5(-)	39.4(+)	-
Growth Rate	-	1.8(+)	2.1	-	1.2(-)	3.7(-)	2.0(+)	-
1960								
Population	97,764	4,915	3,251	4,282	3,251	836	1,131	3,100
Change	39,191	2800(+)	1202(+)	2814(+)	246(+)	161(-)	87(-)	2199(+)
% Change	66.9	62.9(+)	58.7(+)	191.7(+)	8.2(+)	16.2(-)	7.1(+)	244.0(+)
Growth Rate	4.3	8.1(+)	3.8(+)	8.9(+)	0.9(+)	0.01	0.06(-)	0.1(+)
1970								
Population	113,072	6,343	4,975	6,111	3,791	803	2,564	4,600
Change	15,308	1824(+)	1724(+)	1829(+)	540(+)	33(-)	1433(+)	1500(+)
% Change	15.7	40.4(+)	53.0(+)	42.7(+)	16.6(+)	4.0(-)	126.7(+)	84.4(+)
Growth Rate	1.5	3.4(+)	4.3(+)	3.6(+)	1.5(+)	0.4(-)	8.2(+)	4.0(+)
1984								
Population	134,530	8,779	7,435	6,000/5,391	2,538	452	4,211	8,600
Change	21,742	2436(+)	2460(+)	720	953(-)	351(-)	1647(+)	4000(+)
% Change	19.2(+)	38.4(+)	49.4(+)	11.7(-)	25.1(-)	43.7(-)	64.2(+)	86.9
Growth Rate	1.2(+)	2.3(+)	2.9(+)	0.8(-)	2.1(-)	4.1(-)	3.5(+)	4.5(+)

SOURCE: Ghana Population Census Reports, 1931, 1948, 1960, 1970 and 1984. Calculation by Student.

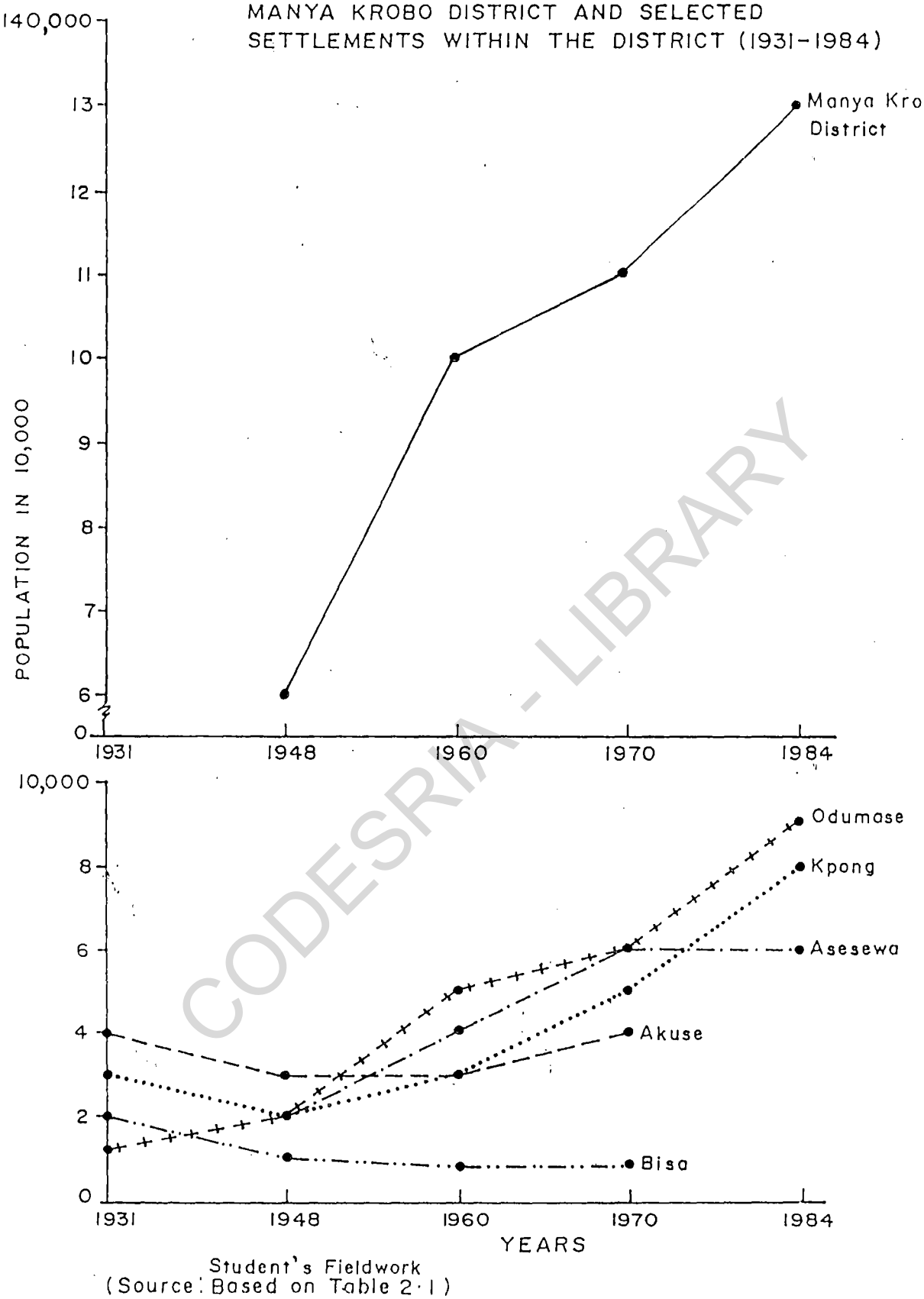
The Manya Krobo District did not exist as a separate administrative area until 1931. The Population census for that year, therefore, did not have any record for it as a separate entity. Indeed before 1931, many of the localities in the Manya Krobo district were under the surrounding administrative areas, particularly the Akuse, Volta and Birim administrative areas. In 1948, the district had a total population of 58,573. This number increased to 97,764 in 1960. There was an inter-censal crude population increase of 39,191; a percentage increase of 66.9 and an annual growth rate of 4.3 per cent (Table 2:1). By 1970, the population in the district had increased to 113,072; giving a positive growth of 15,308; a percentage increase of 15.7 and an annual growth rate of 1.5 per cent. In 1984, the population of the district was 134,814 with a crude increase of 21,742; a percentage increase of 19.2; and an annual growth of 1.3 per cent. This population growth trend in the Manya Krobo District is illustrated in Fig. 2:1. In this illustration, the population growth trend is shown in a line graph which rises steeply between 1948 and 1960, when there was a percentage growth of 66.9. This period is followed by a relative levelling from 1960 to 1970 when the percentage increase was 15.7. There is another steep rise showing a percentage growth of 19.2 between 1970 and 1984.

From the foregoing analysis, it is noted that the Manya Krobo District, as a whole, has been experiencing substantial population increase over the past six decades and that the increase was particularly rapid between 1948 and 1960. This population trend is

an important contributive factor in the acquisition of land which will be examined in Chapter Three and is very pertinent to the general agricultural land use which is the focus of discussion in Chapters Four and Five.

Within the district itself, a number of population trend variations are noted (Table 2:1 and Fig. 2:1). The population growth patterns of a few towns in the district are examined to highlight these variations. Odumase had a modest population of 1269 in 1931 when it ranked fourth among the largest towns in the district. Its population, however, increased steadily to 1719 (35.5 percent increase) in 1948; 4519 (62.9 percent) in 1960; 6343 (40.4 percent) in 1970; and 8,779 (38.4 percent) in 1984. With these population numbers, Odumase was the second largest town in the district by 1960; but by 1984, it had become the largest urban centre in the district in terms of population. Kpong, a junction town and a commercial centre, has, on the other hand, been experiencing fluctuating population growth over the years. With a population of 2904 in 1931, it had the second largest population in the district, second to Akuse (3658). By 1948, the population had decreased by 29.4 per cent to 2049, though it retained its position as the second largest town in the district. Since 1948, the population has increased rapidly to 3251 (58.7 percent) in 1960; 4975 (53.0 percent) in 1970 and 7435 (49.4 percent in 1984). Kpong now ranks third among the only four urban centres in the whole district. The line graph for Kpong (Fig. 2:1) confirms the changing growth trend of the population. Asesewa, with a

Fig.2·1 LINE GRAPHS SHOWING POPULATION TRENDS IN MANYA KROBO DISTRICT AND SELECTED SETTLEMENTS WITHIN THE DISTRICT (1931-1984)



Student's Fieldwork
(Source: Based on Table 2·1)

population of over 5,000, is the only urban centre in the whole of Upper Krobo. Its market, until recently, had a very wide field. Asesewa, as a market town was founded in 1939. The 1931 census report therefore had no record for it (Table 2:1; Fig. 2:1). In 1948, however, Asesewa, with a population of 1468 ranked fourth among the largest towns in the district. The population increased to 4282 (191.7 percent) in 1960 when the town ranked second to Odumase (4519). In 1970, the population of Asesewa had increased to 6111 (42.7 percent) and in 1984 it increased further to 6391 (4.6 percent). In terms of population, Asesewa is now the smallest among the four urban centres in the district.

Akuse, a twin town of Amedeka which was once a flourishing inland port on the Volta River, and with a population of 3658 in 1931, had district dominance in terms of population and administration until 1960 when it was superseded by Odumase (4519) and Asesewa (4282). The population of Akuse, by 1948, had declined to 3005. In 1960, the population increased to 3251 and in 1970, it increased further to 3791. In 1984, Akuse had a population of 2838. Thus Akuse, like Kpong, has been experiencing fluctuations in population growth. Fig. 2:1 illustrates this changing growth of the population of Akuse.

Bisa, once a dominant market centre in Upper Krobo, has now declined into a ghost town. It was superseded by Asesewa in 1939. In 1931 the population was 1865. This declined to 994 (64.5 percent) in 1948; 836 (16.2 percent) in 1960; 803 (4.0 percent) in 1970 and 452 (43.7 percent) in 1984. Bisa therefore typifies that

group of towns that have been having declining population growth despite the steady increasing population in the whole district (Fig. 2:1).

On the other hand, Agomanya is typical of the towns in the district that have grown rapidly over the years. Table 2:1 has no population record for the town in 1931. Agomanya was then an insignificant settlement. In 1948 it had only 901 people. This small population increased rapidly to 3100 (244.0 percent) in 1960; by 1970, the population had reached 4600 (48.4 percent increase). With a population of 8600 (86 percent increase) in 1984, Agomanya has become the second largest town in the Many Krobo District, the largest being Odumase (8799). This growth trend of the population of Agomanya is also illustrated in Fig. 2:1.

In essence, the population of the Manya Krobo District experienced growth of a complex nature between 1931 and 1984. Though the district, as a whole, had a steady positive population growth during the period, individual towns experienced differential population growth (Fig. 2:1). These variations in population growth may reflect differences in the intensity of agricultural land use in the Manya Krobo District over time; for, in the district, the zone of population concentration usually corresponds with the zone of active agricultural operation.

So far, an attempt has been made to analyze the growth of the population in the Manya Krobo District from 1931 to 1984; but the population of the district has been described as the largest among the Dangbe tribes (Huber, 1963, p.15). Following such a

Table 2:2 (Cont'd)

1970 - 1984

COUNCILS	1970 POPU-LATION	1984 POPU-LATION	% INCREASE 1970-84	% TO REGIONAL POPULATION	ANNUAL GROWTH RATE 1970-84
KOFORIDUA M/C	69,776	91,664	31.4	5.5	1.9
YILOR-OSUDOKU L/C	62,357	86,234	38.3	5.1	2.3
MANYA-KROBO L/C	113,072	134,814	19.2	8.0	1.2
AKWAMU-ANUM L/C	43,024	55,596	29.2	3.3	1.8
SUHUM L/C	73,123	107,927	47.7	6.4	2.8
ABUAKWA L/C	78,789	99,372	26.1	5.9	1.7
KWABEN L/C	47,045	67,517	43.5	4.0	2.6
BEGORO L/C	53,045	75,636	42.6	4.5	2.5
NKAWKAW U/C	84,850	124,337	46.5	7.4	2.7
ABETIFI L/C	60.409	74,164	22.8	4.4	1.5
AFRAM L/C	31,486	84,640	59.3	5.0	7.1
		MEAN GROWTH RATE			2.4

SOURCE: Ghana Population Census Report, 1970, 1984. Computations by student.

The figures provided in Table 2:2 indicate that in 1970, the Manya Krobo District, with a total population of 113,072, was the most populous district in the Easter Region. In that year, the district contributed as much as 9.4 percent to the Regional population (Table 2:3).

TABLE 2:3 PERCENTAGE CONTRIBUTION OF THE MANYA KROBO DISTRICT TO THE EASTERN REGION POPULATION 1970 - 1984.

YEAR	POPULATION (REGIONAL)	POPULATION (DISTRICT)	PERCENTAGE OF DISTRICT TO REGIONAL POPULATION
1970	1,209,829	113,072	9.4
1984	1,679,483	134,814	8.0

The Asamankese District ranked second with a population of 101,243. All other districts had populations below 100,000 (Table 2:2).

In 1984, however, the Manya Krobo District, with a population of 134,814, lost its first position in the region to the Asamankese District which had 145,594. According to the 1984 figures, only four other districts had populations above one hundred thousand people. These were Birim-Anafo (102,000); Kade-Akwatia (126,000); Suhum-Aburi (107,000); and Nkawkaw (124,000). The percentage contribution of the Manya Krobo District to the Eastern Region population fell from 9.4 in 1970 to 8.0 in 1984 (Table 2:3). In 1984 Asamankese contributed 8.7 per cent to the Regional population (Table 2:3). Though the Manya Krobo District ranked second in population numbers among the administrative areas in the Eastern Region, its percentage increase from 1970 to 1984 was very low. With a percentage increase of 19.2, the district had the least percentage increase in the Eastern Region. The Afram Plains ranked first with an inter-censal percentage increase of over 1000. (Table 2:4).

TABLE 2:4 FREQUENCY DISTRIBUTION OF DISTRICT PERCENTAGE POPULATION INCREASES IN THE EASTERN REGION (1970-1984

PERCENTAGE RANGES	NUMBER OF COUNCILS	COUNCIL
OVER 100%	1	Afram L/C
40-50%	8	
30-39%	4	
20-29%	4	
BELOW 29%	1	Manya Krobo L/C

SOURCE: From student's field investigation.

In terms of annual population growth rate, the Manya Krobo District had 1.2 per cent between 1970 and 1984, being the lowest growth rate in the Eastern Region.

With the growth of the population in the Manya Krobo District examined, there is the need for the analysis of the spatial distribution of the people in the district. This exercise is attempted in the next section.

2:4 SPATIAL DISTRIBUTION OF THE POPULATION IN THE MANYA KROBO DISTRICT

Population distribution in a geographical area is a vital index for the assessment of land use intensity in that area. The variations in population concentration on the land induce differential intensity in agricultural land use, especially in an essentially agricultural economy. For this reason, it is necessary and pertinent to analyze, in this section, the

distribution of the population in the Manya Krobo District. It is assumed that the pattern of population distribution in the district corresponds positively with the variations in agricultural land use in the area.

The total population of the Manya Krobo District was 134,530 in 1984. With a surface area of 1279 square kilometres (494 square miles), the Manya Krobo District has a crude population density of 105 persons per square kilometre (272 persons per square mile). In 1970 the population density in the district was 89 persons per square kilometre (227 persons per square mile). This population density in the district is greater than the regional density of 87 persons per square kilometre (223 persons per square mile). The increasing population in the district is, however, not evenly distributed over space. The average density is deceptive since it conceals areal variations. For more detailed analysis, it is desirable to attempt an examination of such areal variations and Table 2:5 is provided for this purpose.

TABLE 2:5 LOCAL POPULATION DISTRIBUTION IN THE MANYA KROBO DISTRICT

1	2	3	4
PHYSICAL REGION	**AREA (SQ. KM)**	**POPULATION**	**DENSITY (PERSONS/SQ. KM)**
LOWER KROBO	132	32,121	243
AGODZA	146	4,009	27
PAWMPAWM BASIN	412	81,110	196
AKLUM BASIN	231	7,086	30.6
AFRAM BASIN	130	10,114	77
TOTAL	1279	134,530	-

SOURCE: Compiled by Student.

Population densities for the various physical regions in the Manya Krobo District are provided in column 4 of Table 2:5 for the description of the population in the district.

Lower Krobo is the most densely populated division in the district (Fig. 2:2). In that illustration, Lower Krobo, with a density of 243 persons per square kilometre, has the thickest shading. Lower Krobo has most of the largest and most densely populated towns in the district. Some of such localities include Odumase (8779), the traditional capital of the district; Agomanya (8600) that has the largest market in the district; Kpong (7435); and the Akuse (2838). Indeed three of the four localities considered as urban centres in the district are found in Lower Krobo. Furthermore, Lower Krobo is more urban in character than the rest of the district. It has the only two government hospitals in

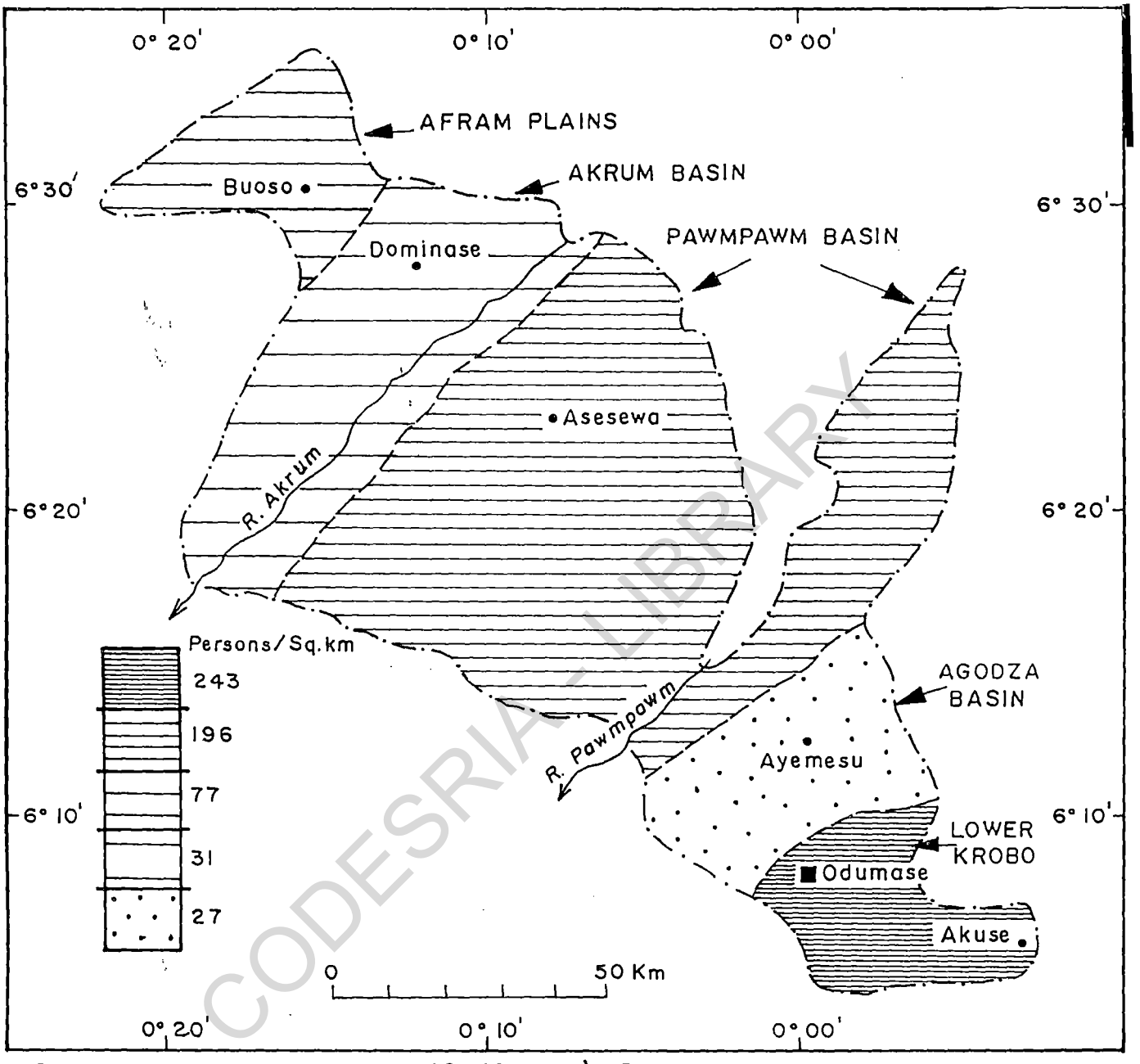
the district, a pipe-borne water delivery system, and electricity supply. Lower Krobo is also a dormitory town for a number of industrial institutions in the neighbourhood.

The Pawmpawm Basin is the second most densely populated division. It has a density of 196 persons per square kilometre (Fig. 2:2). The division has the largest number of localities. Asesewa, which has a population of 6391 and is the only urban centre (with a population more than 5,000) in Upper Krobo, is in the division. Asesewa also has a large market which, in the past, attracted many traders from various parts of the country, particularly southern Ghana (Fig. 2:4). Besides Asesewa, most of the rural settlements in Upper Krobo that have large populations are found in this division. Such localities include Sekesua (1,743), Anyaboni (1,583), Bukrum (1,554) and Aketebour (1,291).

The Afram Plains is the third most densely populated division. It is a frontier area where the Krobo have frequent clashes with their Kwahu neighbours over land ownership. The concentration of the population is therefore essentially for defensive purposes.

The Aklum Basin ranks fourth in terms of population density. It has a density of 31 persons per square kilometre. Agodza has the least population concentration. Its density is only 27 persons per square kilometre. As stated earlier, Agodza was originally settled by the Krobo at the turn of the nineteenth century and was later abandoned almost completely as a result of over-cultivation and environmental degradation. It is now being resettled owing to land scarcity in the other divisions of Upper Krobo. The population

Fig.2·2 POPULATION DISTRIBUTION IN THE MANYA KROBO DISTRICT



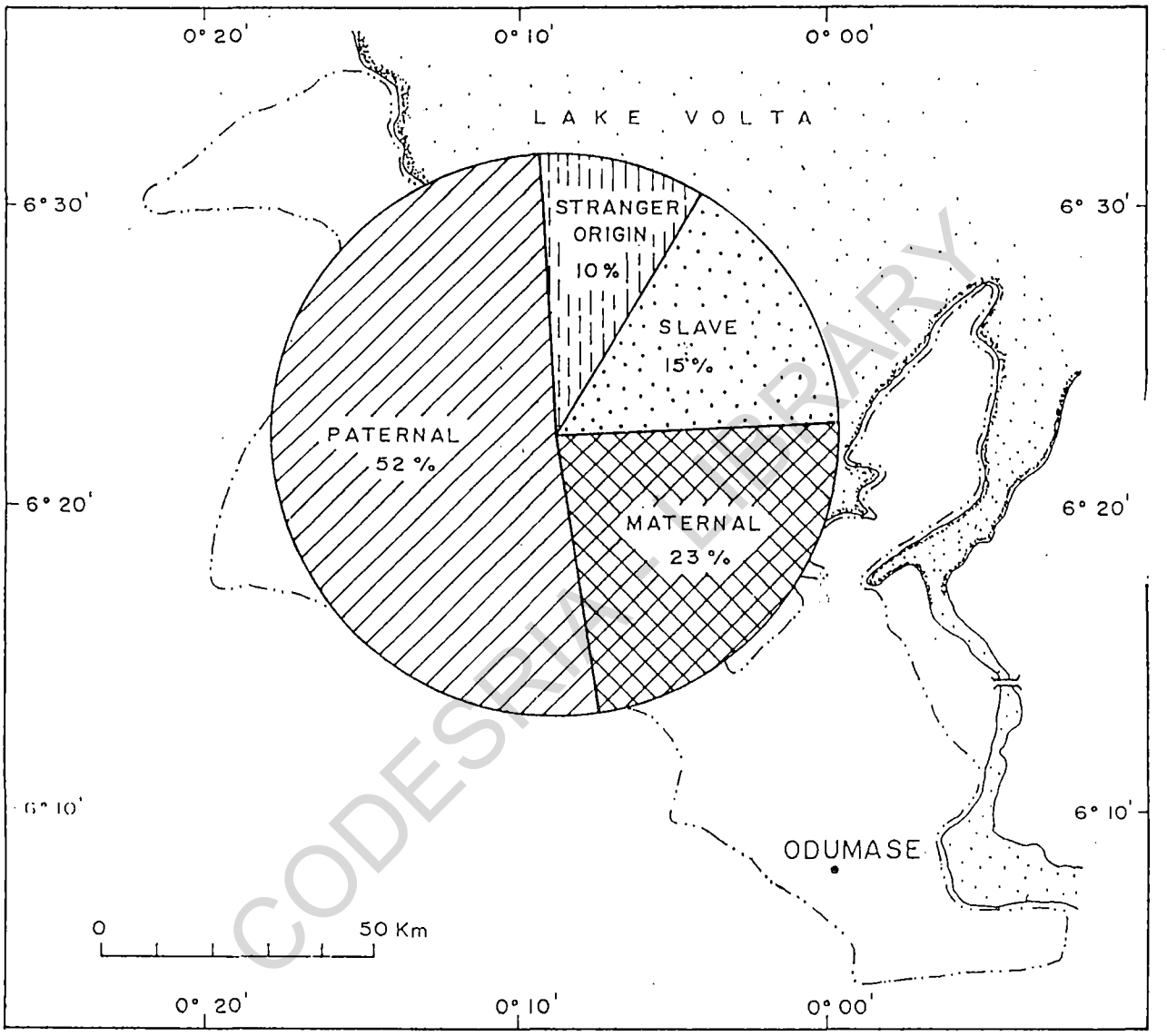
Source: Ghana Population Census, 1984/Student's Fieldwork

distribution described above is illustrated in divided circle for graphic presentation (Fig. 2:3).

It is worthy of mention here that the population of the Manya Krobo District is floating. About 90 percent of the people in Upper Krobo have homes in Lower Krobo. A large proportion of the population in Upper Krobo therefore move to Lower Krobo for the "Dipo" puberty rites in April and in May; for the "Nadu" Festival in June; and for the "Ngmayem" Festival in October. These festivals are for the worship of the "Nadu" war deity and to mark the harvest of the year. The occasions are also for family and clan meetings, reconciliation and community development projects. Similarly about 80 percent of the population in Lower Krobo have villages in Upper Krobo where they go during the farming season. Within Upper Krobo too, there is much inter-Huza movement to areas where people own other holdings during the farming season. Thus, the population density, as described in this section, is subject to these internal movements. A locality can have its population increased or decreased according to the particular time of the year.

The spatial distribution of the population is, essentially, the most important demographic factor that influences agricultural land use in the Manya Krobo District. The relationship between the two variables is addressed in Chapters Four and Five. Another important demographic factor in the population-agricultural land use relationship is the characteristics of the population. This factor is discussed in the next section.

Fig.2·3 A DIVIDED CIRCLE SHOWING THE COMPOSITION OF THE KROBO POPULATION



Source : From Student's Fieldwork

2:5 THE CHARACTERISTICS OF THE POPULATION IN THE MANYA KROBO DISTRICT.

2:5:1 SEX COMPOSITION

The sex distribution of a population is an indispensable factor in agricultural land use in a region. Generally it determines the reproductive potential of the existing population; the labour force participation in an area; and the migratory patterns of the people. For these reasons, the sex distribution of the population in the Manya Krobo District is examined here as a prelude to the analysis of the inter-relationship between population and agricultural land use in the district.

The total population of 134,814 recorded in the Manya Krobo District in 1984 had a breakdown of 67342 males and 67188 females. From these figures, it might be legitimate to generalize that there are as many males as there are females in the district since the male population exceeds the female population by only 154. The sex ratio of 100.2 males to 100 females is an indication that the difference between the two populations is very negligible. Deviations from this general distribution within the district, however, could not be ruled out. For the study of such spatial variations of sex ratios within the district, Tables 2:6 to 2:7 are provided.

TABLE 2:6 SEX DISTRIBUTION OF THE POPULATION IN LOWER KROBO

LOCALITIES	MALE	FEMALE	SEX RATIO
Asitey Dorn	307	438	70
Atua	614	670	91
Kodzonya	323	447	72
Manya Kpongunor	1819	2392	76
Nuaso	1023	1533	66
Impregilo	914	645	141
Okwenya	213	269	79
Odumase	3852	4927	78
Agomanya	3736	4864	76
Akuse	1357	1481	91
Kpong	3700	3735	99
TOTAL	17,645	21,401	82.4

SOURCE: 1984 Ghana Population Census Report Manya Krobo District. pp. 02-18

Table 2:6 provides population figures for the sexes for the main localities in Lower Krobo. For the 11 localities, there were 17,645 males and 21,401 females in 1984. This gave a sex ratio of 82.4 males to 100 females. Individually only Impregilo had a sex ratio over 100. Impregilo, essentially, is a resettlement area housing workers of the Kpong Hydro-Electric station. The population, which is predominantly males, therefore deviates from the general sex distribution in Lower Krobo. It might then be concluded that, in Lower Krobo, the women outnumber the men. This

difference in sex distribution might be explained by the fact that Lower Krobo, being more urban than Upper Krobo, attracts more women who engage in non-agricultural activities, particularly, trade.

Table 2:7 is for some of the main localities in Upper Krobo. Each selected locality had a population of, at least, 300 in 1984.

TABLE 2:7 SEX DISTRIBUTION IN SOME OF THE MAIN LOCALITIES IN UPPER KROBO

LOCALITIES	MALE	FEMALE	SEX RATIO
Sekesua	889	854	104
Eshiamikyiri	780	734	105
Takorase	561	534	105
Prekumase	580	524	110
Dawatrim	307	251	122
Fefe	322	312	103
Asedza	400	403	99
Aketebour	675	617	109
Satapong	515	477	108
Osonson	385	378	101
Anyaboni (VRA)	777	806	95
Bukrum	834	720	115
TOTAL	7025	6611	106

SOURCE: 1984 Ghana Population Census Report, Manya Krobo District, pp. 02-18.

In Table 2:7, 7,025 of the total population in these localities were male while 6,611 were female. The sex ratio of these localities was 106 males to 100 females. Only 2 (16 percent) had sex ratios below 100. These were Asedza (99) and Anyaboni (V.R.A.) (95). It is considered desirable to examine the sex composition of some of the smaller habitats in Upper Krobo too to make any conclusion on the sex structure in the district more

representative. The relevant data for such localities are given in Table 2:8.

TABLE 2:8 SEX DISTRIBUTION IN SOME OF THE SMALLER LOCALITIES IN UPPER KROBO

LOCALITIES	MALE	FEMALE	SEX RATIO
Kumakuma	193	193	100
Nuannu	234	250	93
Etwento	187	183	102
Aworworso Piengua	173	148	115
Abuasa	198	168	117
Apimsu	166	157	105
Akotwe Takpom	154	121	127
Tardokor	173	153	113
Dawa Yokunor	99	90	110
Odometa Kpeti	219	162	135
Aframase Yiti	132	117	112
Abutsam (Abutsam)	94	79	118
Sawa Sisi	107	95	118
Akotroko	123	85	144
Pawmpawmnya	152	122	124
	2406	2123	113

SOURCE: 1984 Ghana Population Census Report, Manya Krobo District, pp. 02-18.

A male population below 300 is the basis for the selection of the localities in Table 2:8. These localities were selected randomly out of the number of localities with such small populations in Upper Krobo in 1984. Out of the 15 localities, 13 (86 per cent) had sex ratios of more than 100 males to 100 females. Of the remaining 2 localities, one (Kumakuma), had 100 and the other (Nuannu) had 93. Of the 13 localities that had sex ratios above 100, 10 (76 per cent) had ratios more than 110 males to 100 females. From the findings (Tables 2:7 and 2:8), it is clearly evident that, in Upper Krobo, there was a general male predominance

in the population. Upper Krobo, which is the active zone of farming activities in the Manya Krobo District, has greater attraction for the male population than the female population.

To complete the analysis of the sex distribution in the Manya Krobo District, the population of the five largest settlement in the area are examined to give the pattern of sex distribution in these "urban" localities. The details are provided in Table 2:9.

TABLE 2:9 SEX DISTRIBUTIONS IN THE MAIN TOWNS IN THE MANYA KROBO DISTRICT

LOCALITIES	MALE	FEMALE	SEX RATIO
Odumase	3852	4927	78
Agomanya	3736	4864	76
Akuse	1357	1481	91
Asesewa	3700	3735	99
Kpong	3119	3272	95
	15,764	18,277	85

SOURCE: 1984 Ghana Population Census Report, Manya Krobo District, pp. 17-18.

With the exception of Akuse, the localities in Table 2:9 are considered as urban centres. They have populations of 5,000 or above (1984 Ghana Population Census Preliminary Report). Collectively, these urban areas have a sex ratio of 85 males to 100 females which gives the female population 15 percent dominance over the male. In essence, the female population predominates in the urban communities in the Manya Krobo District.

From the foregoing analysis of the sex distribution in the Manya Krobo District, as a whole, the following generalizations could be made:

structure (Clarke, 1972). Specifically, age structure has economic as well as social importance for any agricultural society since it determines the labour force and the age dependency burden of that society. Because of the particular importance of the age structure in an agricultural society, it is identified for examination here as one of the population components that will be related to agricultural land use in the Manya Krobo District. Table 2:10 provides the pertinent data for the analysis.

TABLE 2:10 POPULATION AGE DISTRIBUTION IN THE MANYA KROBO DISTRICT

AGE GROUP	TOTAL POPULATION No.	%	MALE No.	%	FEMALE No.	%
0 - 14	55,875	41.5	18,311	13.6	27,475	20.4
15 - 24	26,015	19.5	13,317	9.9	12,698	9.4
25 - 44	29,804	22.1	15,080	11.2	14,724	10.4
44 - 64	15,037	11.1	7,113	5.2	7,924	5.9
64+	7,799	5.8	3,432	2.5	4,367	3.3

SOURCE: Population Figures from 1984 Ghana Population Report calculations by student.

Table 2:10 provides the data for the various age groups of the population in the Manya Krobo District. In 1984, there were 55,875 people in the 0 - 14 age group. Thus about 41.5 percent of the total population in the district were in this age group. Twenty-six thousand and fifteen (26015) people (19.3 percent) were in the age group 15 - 24; 26804 (22.1 percent) were in the age group 25-44;

15037 (11.1 percent) were in the age group 45 - 64; and in the age group above 64, there were 7799 people (5.8 percent).

Before some general conclusions are made on the age structure of the population, the dependency ratio is calculated below. According to Hampt and Kane (1985), the dependency ratio is the ratio of the economically dependent part of the population to the productive part. Operationally defined, this is the ratio of the combined populations of the elderly (those aged 65 and above) and the young (those under 15 years of age) to the economically active population (16-64 years of age: Hampt and Kane, 1985). The above definition is summarized thus

The crude age dependency ratio is

$$\frac{P\ 0 - 14 + 65 \text{ and above}}{P\ 15 - 64} \times 100$$

The crude age dependency ratio of the population in the Manya District, therefore, works out as below.

$$\frac{55875 + 7799}{70856} \times 100 = 89.9$$

The finding shows that in 1984 the Manya Krobo District, had 89.9 persons in the dependent ages for every 100 persons in the economically independent ages. This ratio is lower than that of Syria in 1981 (104) but higher than that of the United States (51) (Hampt and Kane, 1985, p.11).

From Table 2:10, the percentage of the economically independent population, could also be calculated from the formula below:

$$P = \frac{15 - 64}{\text{Total Population}} \times 100$$

This works out to be

$$\frac{70856}{134530} \times 100 = 52.5 \text{ per cent}$$

From the foregoing analysis, the following pertinent statements could be made.

1. In the Manya Krobo District, the economically active population is 52.5 percent of the total population. This percentage could, however, be deceptive, since in an agricultural economy, like that in the Manya Krobo District, active economic activity does not end at the age of 64. Indeed 103 out of the 500 respondents in the Manya Krobo District, aged between 64 and 78, were still in active farming. In such agricultural communities the upper limit for the economically active population could be extended from 64 to, at least, 75. In the field, it was found out that the continued involvement of the people aged 65 and above in active agriculture increased the intensity of land use leading to the shortening of the fallow period.
2. The high dependency ratio of the population in the district has serious implications for agricultural land use. In the use of the land, the farmer in the district was found to give consideration not only to his personal needs in a year, but also his dependent burden. The greater the burden, therefore, the more intensive he is likely to use the land.
3. 41.5 percent of the total population is under 15 years of age (Table 2:10). This finding is indicative of the youthfulness of the population in the Manya Krobo District (Fig. 2:4).

From the agricultural point of view, this youthfulness has the potential of putting greater stress on the land in future; unless additional land is acquired soon, or there is an occupational change. Demographically, the youthfulness of the population is also suggestive of high fertility patterns in the district. This makes it necessary for the fertility and mortality patterns, as they affect agricultural land use in the district, to be examined too.

2:5:3 FERTILITY AND MORTALITY RATES IN THE MANYA KROBO DISTRICT

Of the three constituents of population change in a region (birth, death and migration), birth and death are very fundamental. Their influence on population growth is enormous. There is therefore a crucial need for their examination in any effort to understand population issues in a region. Consequently, the birth and death rates of the population in the Manya Krobo District are examined in this section to give some insight into the pattern of natural population growth in the district.

Traditionally, all Krobos are to bury their dead in Lower Krobo. This traditional provision makes Odumase a central point for the registration of deaths in the district. For the sake of decentralization, however, substations for the registration of death are opened at Asesewa and Kpong. The collection of data on mortality, in the Manya Krobo District should, thus, not be a problem. Nevertheless, there is a great depth of doubt about the accuracy of data on death in the district as a result of poor

compilation and storage of returns. Against this background, the figure of 1828 deaths recorded in the district in 1988 is to be accepted with some caution. This figure gives a death rate of 13.6 deaths per 1000 people for the district (Appendix 3). This rate is found to be within the range of 10 to 15 suggested for the country by Gaisie (1976). Compared to the Eastern Region's death rate of 15.2 (National Demographic Sample Survey, 1970) and 15.5 (Registered System, 1968-69) which is described as modestly high (Gaisie, 1977 pp.104-105), the death rate of the Manya Krobo District could also be described as moderately high.

In the area of birth, there is a serious dearth of data. Unlike death, there is no traditional provision that all births are to take place in Lower Krobo. Furthermore, unlike death, there is general lack of urgency about birth registration. Numerous births that take place in the remote localities in the Manya Krobo District are therefore not covered by any registration. Lack of appreciation of the importance of birth certificates in the rural communities was found to be the main cause of the low level of birth registration in the rural localities. Writing on "Fertility Levels in West Africa", Hilary Page sums up the problem associated with demographic data in West Africa in the following words:-

> "Despite recent advances in the collection and analysis of demographic data from Tropical Africa, estimation and interpretation of fertility patterns are still a hazardous undertakings, for the primary data are both limited and defective" (Page, 1975).

Under the circumstances, the birth rate in the Manya Krobo District has to be estimated from the inadequate data available.

At the Birth Registry at Odumase there was a record of 1251 births in 1988. From this figure, the birth rate for the Manya Krobo District is estimated to be 45.7 births per 1000 population. The method of estimation is shown below. The assumption is that 1251 was the number of births for Odumase as a locality, and therefore, represents 27,332 population (of Odumase). The District population (134,530) might then be represented by how many births.

$$= \frac{1251 \times 134530}{27332}$$

$$= 6157 \text{ Births}$$

$$\text{Birth rate formula} = \frac{\text{No. of Births} \times 1000}{\text{Total Population}}$$

$$= \frac{6157 \times 100}{134530}$$

$$= \underline{45.7}$$

For comparison, some recorded birth rates for the Eastern Region are given. Forty-nine (49) births per 1000 population (Caldwell, 1975); 43.5 births per 1000 population (Gaisie, 1976, p.61). It is estimated that only about 26 to 30 percent births are registered in the Eastern Region (Gaisie, 1976, p.55). Consequently 45.7 births per 1000 population could be a reasonable estimate for the Manya Krobo District.

Generally, therefore, both the birth rate and the death rate in the Manya Krobo District could be said to be quite high. The district could thus be said to be in the early stages of its demographic transition with a potential for rapid population growth. Such a rapid population has serious implications for

agricultural land use. To complete this section, an attempt is made to look at fertility levels in the district.

2:5:4 FERTILITY PATTERNS IN THE MANYA KROBO DISTRICT

The fertility pattern in a population is a good index of its growth rate and the analysis of it in the Manya Krobo District is considered a helpful exercise for this study. The hypothesis to be tested is that the women in the Manya Krobo District have high fertility. A special investigation was made to determine the fertility level in the district. Two hundred (200) women aged 45 and above were interviewed to estimate their completed fertility pattern. The interview was randomly conducted at Odumase, Agomanya, Dawatrim, Osonson and Asesewa. Odumase and Agomanya represented Lower Krobo and the urban centres, Asesewa represented the urban centres in Upper Krobo and the localities whose populations were made up of both Krobos and non-Krobos. Dawatrim and Osonson were selected because of their typical rural nature. The findings of the interview are tabulated below (Table 2:11).

TABLE 2:11 FERTILITY PATTERN IN THE MANYA KROBO DISTRICT

RANGES OF CHILDREN EVER BORN PER A WOMAN	FREQUENCY OF NUMBER OF WOMEN	TOTAL NUMBER OF CHILDREN FOR THE GROUPS	% OF NO. OF WOMEN IN THE GROUP TO TOTAL NO. OF WOMEN	AVERAGE NUMBER OF CHILDREN FOR THE GROUP
OVER 12	8	103	4.0	13.0
10 - 12	23	245	11.5	10.7
6 - 9	114	902	57	7.9
4 - 5	19	87	9.5	4.5
2 - 3	24	63	12.0	2.6
1	7	7	3.5	1.0
NIL	5	0	2.5	0
-	200	1407	100	7.04

Source: From student's field study.

In Table 2:11, eight (8) out of the 200 women interviewed had over 12 children in their life time. A total of 103 children were born to the 8 women. Four (4) percent of the respondents therefore had 13 children each. Twenty-three (23) women also had between 10 and 12 children in their life time and a total of 245 children. 115 percent of the 200 women therefore had an average completed fertility of 10.7 children per woman. One hundred and fourteen (114) women had a total of 902 children. These women had a range of 6 to 9 children per woman and a fertility level of 7.9 per woman. Next, 19 women out of the 200 interviewed (9.5 per cent) were in the 4-5 group and had a fertility level of 4.5 children per woman. Twenty-four (24) respondents (12 per cent) were in the 2-3

range. They had a total of 63 children and a fertility level of 2.6. Seven(7) women (3.5 per cent) also had a child each and a fertility level of 1.0. Lastly there were 5 women who had no children at all. They formed 2.5 percent of the total number of women interviewed.

On the whole, the 200 women interviewed had an average of 7.04 children per woman. Only 27.5 percent had below 6 children per woman. The bulk of the women (57 per cent) had 7.9 children per woman. 15.5 per cent of the respondents, however, had fertility level above 7.9 children per woman. This finding is supported by the responses in the interview schedules. The 500 respondents indicated that they had a total of 1126 wives. Out of this number of wives, 871 (77.3 percent) had more than 6 children each. The fertility level of 7.04 in the Manya Krobo District falls within the Eastern Region's fertility level range of 6.8-7.4 which, according to Gaisie, could be ranked among the highest fertility levels in the country (Gaisie 1976). Thus, the field investigation supports the hypothesis that in the Manya Krobo District, fertility is high. This high fertility in the district, is a major contributory factor to the rapidly growing population. The preference for a large number of children in the district was found to be a response to the labour intensive agricultural land use in the area.

The importance of the high fertility and large families in the farming system in the Manya Krobo District cannot be overstressed; for, apart from the family being a source of labour

and prestige for the farmer, the number of children a farmer has is usually a paramount consideration in his crave for new lands and the number and size of his farms in a year. The field investigation, however, revealed that a proportion of the population is engaged in economic activities other than agriculture. It is thus considered a worthy exercise to examine in the next section the occupational structure of the population in the district.

2:5:5 THE OCCUPATIONAL STRUCTURE OF THE POPULATION IN THE MANYA KROBO DISTRICT

The details of the occupational structure of the population in the Manya Krobo District are tabulated below (Table 2:12).

TABLE 2:12 OCCUPATIONAL STRUCTURE OF THE POPULATION IN THE MANYA KROBO DISTRICT (1984)

SEX		TOTAL AGED 15 AND ABOVE	EMPLOYED	EMPLOYED IN AGRI-CULTURAL	UNEM-PLOYED	HOME MAKERS	OTHER EMPLO-YMENT
MALE	NO.	38942	32134	23295	498	212	6098
	%		(84.7)	(59.8)	(1.3)	(0.5)	(15.6)
FEMALE	NO.	39713	34273	20833	337	840	4263
	%		(86.3)	(70.1)	(0.8)	(2.1)	(10.7)
TOTAL	NO.	78655	66407	44128	835	1052	10361
	%		(84.4)	(48.3)	(1.0)	(1.3)	(13.1)

SOURCE: Population Figures - Ghana Population Census, 1984. Percentage Figures - Calculated by Student.

(i) TOTAL POPULATION EMPLOYED

In the Table 2:12, out of the total of 78,655 people of 15 years and above, 66,407 (84.4 percent) were employed. Of these employed people, 32134 were male while 34273 were female. 48.3 percent male and 51.7 percent female were therefore employed. Thus in the Manya Krobo District there is a high level of employment among both sexes.

(ii) POPULATION EMPLOYED IN AGRICULTURE

In Table 2:12, a total of 44.128 people, about 66.5 per cent of the total number of people employed in the Manya Krobo District, were in agriculture, hunting, forestry and fishing. 23295 out of the 44,128 (52.8 percent) were male while 20833 (47.2 percent) were female. It needs to be stated that, in the Manya Krobo District, hunting and forestry are no more popular occupations. While forestry is virtually non-existent as a result of the destruction of the forest cover in the farming process, hunting is done on a very small scale as part-time occupation. During the field investigation no one was found to be solely engaged in hunting. In fact the destruction of the forest and the frequent bush fires had driven many animals, which could be profitably hunted, away from the district. Fishing, on the other hand, is increasingly becoming important in the district as a result of the extension of the Volta Lake into the district. Thus, in some of the localities along the Pawmpawm and Afram rivers, particularly Bukunor, Akotoe and Akateng, a number of people engage in fishing. Even in these

old people aged above 70 years who depend on remittances from relations in Upper Krobo and in the urban areas in other parts of the country.

(iv) HOME MAKERS IN THE POPULATION

In Table 2:12, 1052 people were recorded as home makers in 1984. A home maker is defined as a person wholely engaged in household duties and not paid for the work (Ghana Population Report, 1970, p. xxii). The field investigation revealed that in Upper Krobo, there are hardly any persons who are wholely home makers. Even women in this area regard as something of the past the situation in which married women remained solely home makers. As a result of changing economic conditions, many married women now have their own farms in addition to the assistance they give their husbands on the family farms. Similarly a large proportion of the youth who do not have their own holdings work on the holdings of absentee farmers on share-crop basis in addition to the provision of labour on the farms of their parents. The production of such crops as vegetables, particularly pepper, tomatoes, garden eggs and beans, is now essentially the occupation of such women and the youth who could be classified as home makers. Conversely, in Lower Krobo, where there is scarcity of farming land, there are a number of women and young men who could fall into the category of home makers. In such cases, however, the more enterprising among them engage in trading.

(v) NON-AGRICULTURAL EMPLOYEES

A total of 10,361 were employed outside agriculture in the district in 1984 (Table 2:12). The field investigation confirmed the presence of such a large number of people in the category. Such people were identified as traders, masons, carpenters, auto-mechanics, tailors and dressmakers, drivers, employees of the District Council, teachers and personnel of the financial houses, to mention a few. A large number of these non-agricultural workers, nevertheless, have farms on family holdings or acquire land for agricultural practices on share-crop basis. This category of people therefore partly engage in agriculture.

In essence, therefore, a large proportion of the population in the Manya Krobo District engage in agricultural activities.

2:6 EDUCATIONAL STRUCTURE OF THE POPULATION IN THE MANYA KROBO DISTRICT

Formal education has immeasurable impact on agricultural land use, for, it exposes an agricultural population to literature on modern methods of farming. Farm management, weed control, farm produce marketing, pest and disease control are some of the information that a literate agricultural population can readily have access to. Because of this great importance of formal education in agriculture, the educational structure of the population in the Manya Krobo District is examined in this section to aid an assessment of its impact on agricultural practices in the district. For such an exercise, the details of the educational background of the respondents are given in Tables 2:13 and 2:14.

TABLE 2:13 LEVEL OF EDUCATION OF PEOPLE AGED 40 YEARS AND ABOVE

LEVEL OF EDUCATION	NUMBER	PERCENTAGE
No formal education	361	72.2
Middle School	64	12.8
Secondary School	20	4.0
Teacher Training College	22	4.4
Commercial & Technical School	19	3.8
University	1	0.2
No Response	13	2.6
Total	500	100.00

SOURCE: ***Computed from student's field work data.***

In Table 2:13, out of 500 respondents of 40 years and above, 361 (72.2 percent) had no formal education. Sixty-four (64) (12.8 per cent) had basic education and only 20 (4.0 per cent) had Secondary School (Second cycle) education. Those with Teacher Training education were 22 (4.4 per cent) while 19 (3.8 per cent) of the people had commercial and technical education. Only one respondent (0.2 percent) had university education. A very high percentage of the elderly people in the district, therefore, had no formal education. Indeed the educational level of these elderly people was found to be very low. Many of these people were in their youth during the first quarter of the century when education was, on the whole, not very popular in Kroboland; emphasis was on agriculture and children were expected to help their parents on their farms.

The finding above is, however, not representative of the educational background of the people in the district as a whole.

For a more representative assessment, the educational background of the youth, between 20 and 40 years of age, is examined. The details are provided in Table 2:14.

TABLE 2:14 EDUCATIONAL LEVEL OF PEOPLE BETWEEN 20 AND 40 YEARS OF AGE

AGE	EDUCATION-LEVELS ATTAINED	TOTALS	PERCEN-TAGES	GROUP TOTALS	GROUP %
20-25	No formal education	23	3.5	176	26
	Middle School	76	11.6		
	Secondary School	38	5.6		
	Lower Tertiary +	22	3.4		
	Upper Tertiary *	12	1.8		
26-30	No formal education	32	4.8	203	31
	Middle School	71	10.9		
	Secondary School	62	9.5		
	Lower Tertiary +	23	3.5		
	Upper Tertiary *	15	2.3		
31-35	No formal education	15	2.3	137	21
	Middle School	41	6.3		
	Secondary School	40	6.1		
	Lower Tertiary +	22	3.4		
	Upper Tertiary *	19	3.0		
36-40	No formal education	34		143	22
	Middle School	40	6.1		
	Secondary School	32	4.9		
	Lower Tertiary +	25	3.8		
	Upper Tertiary *	12	1.8		
		654	100.0	654	100

+ Lower Tertiary - Between A/L (SSS) and University.
*** Upper Tertiary - University level.**
SOURCE: Student's compilation.

Table 2:14, compared to Table 2:13, shows the increasing level of formal education in the Manya Krobo District. Despite this increasing level of education in the district, scientific and technological knowledge have not as yet made any significant impact on agriculture in the district. The cutlass is still the main

farming tool in the district and scientific agricultural methods such as crop rotation, mechanization, irrigation, weed and pest control, soil conservation and other farm management methods are still not practiced in the agricultural system of the district. The results are increasing environmental degradation and decreasing farm yields which will be discussed in Chapter Four.

Another component of the population that influences agricultural land use in the Manya Krobo District is the non-resident population. This population influences agricultural land use through the market economy. It is discussed in the next section to show its impact.

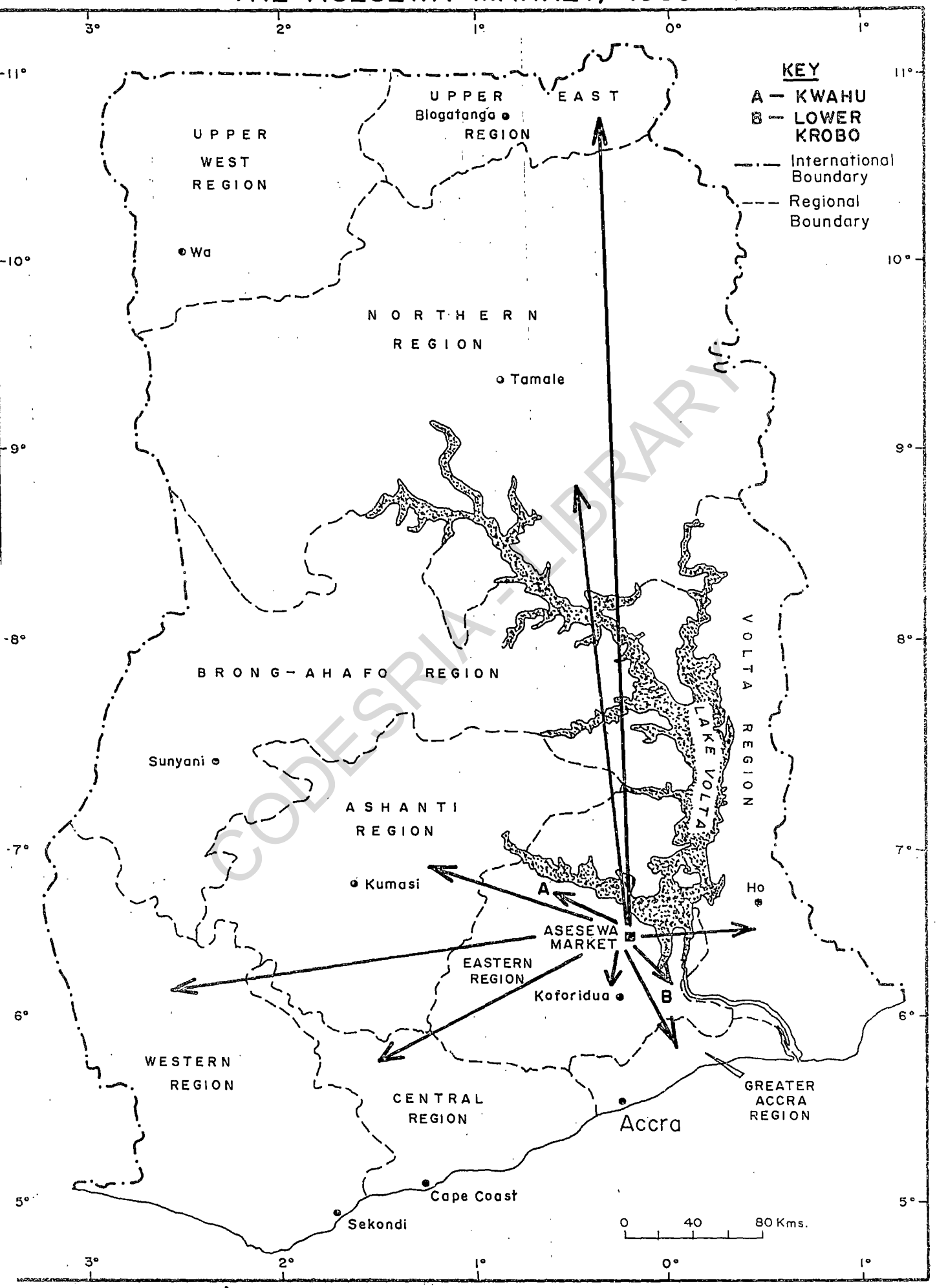
2:7 THE NON-RESIDENT POPULATION AND AGRICULTURAL LAND USE IN THE MANYA KROBO DISTRICT

The agricultural economy in the Manya Krobo District has gone beyond the subsistence level as large quantities of the produce enter the external economy (Morgan, 1969). As a result of the ecological difference between the more humid area of the Manya Krobo District and the drier area of the Accra Plains, the district has become a "granary" for the dense population of the eastern half of the Accra Plain. Additionally, the Manya Krobo is an important food supplying area for the urban population of Koforidua and its surrounding areas. To provide for this external market, the Krobo have had, in succession, traditional markets in their active zones of agricultural production. Thus centres like Akuse, Ajena, Manya Kpongunor, Otrokpe, Apimsu, Bisa, Sekesua, Asesewa and Obuoso have all been Krobo traditional markets. Between 1939 and 1970, Asesewa

was the market with the largest dominance in the district. Its zone of influence extended as far as the Western, Ashanti and Northern Regions of the country (Fig. 2:4). Asesewa is now superseded by Agomanya as the market centre with the largest dominance in the district. Unlike Asesewa, Agomanya's market field is limited largely to the south-eastern corner of the country. Main receiving areas include the whole of the Manya Krobo District; Shailand; the Accra - Tema Metropolitan area; the Dangbe coastal towns of Kpone, Prampram, Ningo and Ada; Akwapim; Osudokuland; and the Volta Region (Fig. 2:6). To assess the volume of trade in agricultural produce with these receiving areas, a market survey was conducted at Agomanya on 23rd and 26th August, 1989. The details are shown in Table 2:15.

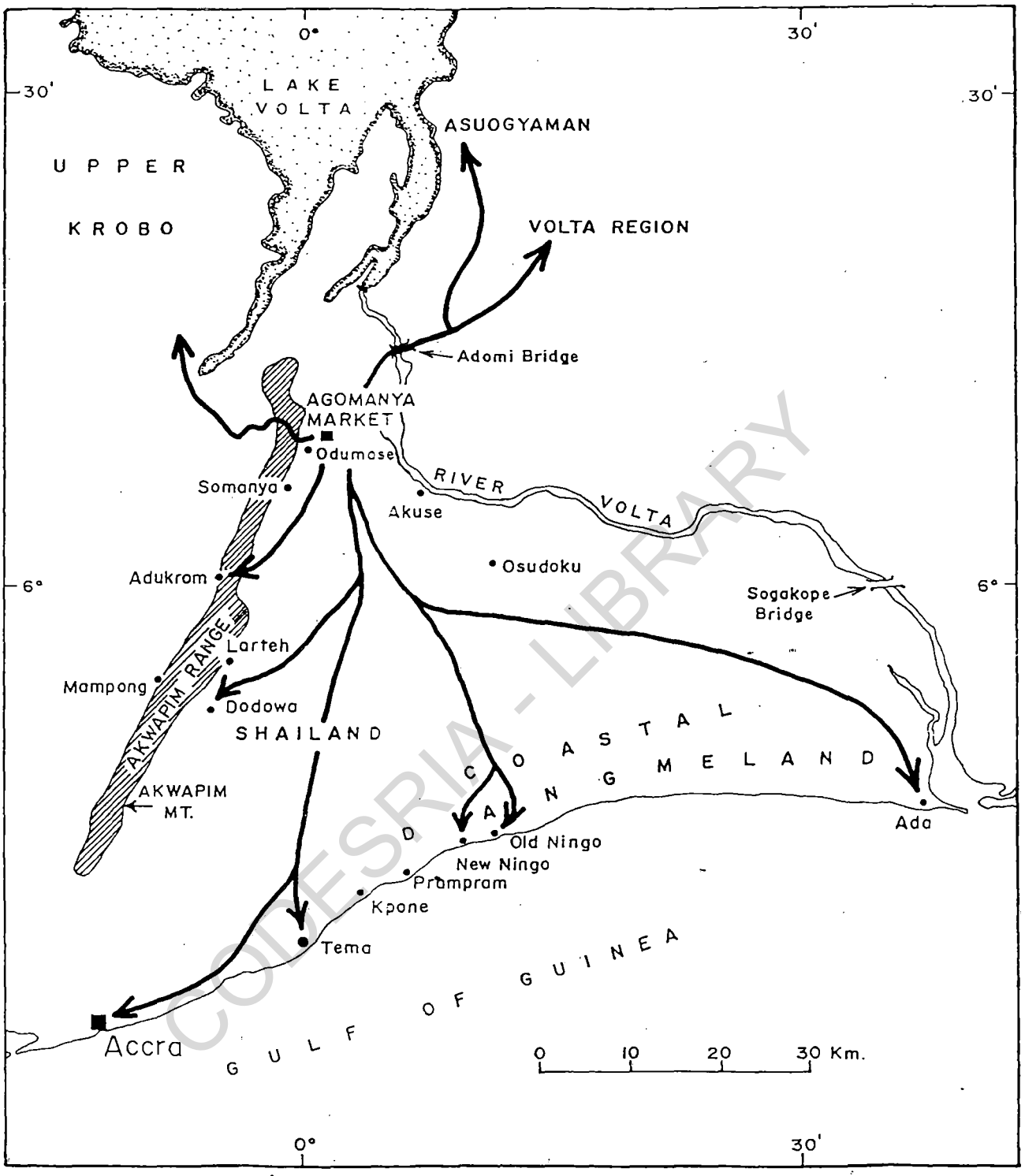
The extensive market fields of the Asesewa and Agomanya markets as shown in Figures 2:5 and 2:6 is indicative of the large market population that, though resident outside the district, influences agricultural land use in the district. This category of population induces much intensity in the use of the land agriculturally, for, as the farmer grows his crops, he gives consideration to the market that gives him his non-agricultural needs. A survey conducted at Dawatrim to determine the volume of agricultural produce sent to the market as a percentage of the total production showed that about 70 percent of the maize, cassava, plantain pepper and garden eggs produced in the locality is sent to the market. Thus about 70 percent of the agricultural land use in the district is induced by the market economy.

Fig.2·4 GHANA: SHOWING THE MARKET-FIELD OF THE ASESEWA MARKET, 1939-1970.



SOURCE: From Student's Fieldwork; Data collected in July and August, 1988.

Fig.2·5 SOUTH EASTERN GHANA SHOWING THE MARKETFIELD OF THE AGOMANYA MARKET



Source: From Student's Fieldwork; Data collected in July and August, 1988.

TABLE 2:15 AGRICULTURAL PRODUCE FROM THE AGOMANYA MARKET TO THE CONSUMING CENTRES

DESTINATION	No. OF LORRIES	BAGS OF MAIZE	BAGS OF CASSAVA	BASKETS OF VEGETABLES
Accra	15	365	62	71
Tema	11	241	49	53
Ada	9	111	36	31
Prampram	8	68	23	20
Sege	2	21	20	13
Ningo	10	73	-	13
Asutsuare	7	42	30	14
Ajena	5	22	6	-
Ho	6	51	2	8
Akosombo	8	36	27	10
Dodowa	4	26	10	-
Akwapim	4	18	4	5
Sogakope	3	24	-	-

SOURCE: From field study based on market surveys on August 23 and 26, 1989.

In this Chapter, the characteristics of the population in the Manya Krobo District have been examined as a background to the analysis of the inter-relationships between population and agricultural land use in the district. In the next chapter, focus is on population growth and agricultural land acquisition by the Krobo.

CHAPTER THREE

POPULATION GROWTH AND AGRICULTURAL LAND ACQUISITION BY THE KROBO

3:1 INTRODUCTION

Land acquisition has been a pre-occupation of Krobo farmers since their settlement on the Krobo Mountain. The mountain was settled because it was found to be suitable for habitation (Odonkor, 1971; Azu, 1926). The suitability of the mountain, however, excluded its cultivation for it was rocky with steep slopes. Thus, though the Krobo Mountain provided security for the people, there was a pressing need for cultivable land for sustenance. Unfortunately this cultivable land was already owned by the Akan neighbours: namely the Akwapim, the Kotopeli, the Akwamu, the Jekiti, the Akim and the Kwahu (Odonkor, 1971; Reindorf, 1889). The acquisition of the land that the Krobo now traditionally occupy, from the Krobo Mountain to the Afram Plains, therefore, quite often involved conflict over the ownership of the land. The conflict was between the Krobo and their Akan neighbours.

As a methodology for the analysis of the processes of land acquisition, the spatial diffusion and the conflict analysis models are used. The spatial diffusion model (Brown, 1958; Abler, 1972) is used to examine the spread, by land acquisition and occupation, of the Krobo from the Krobo Mountain to the Afram Plains. The conflict analysis model (Ley and Mercer, 1980) on the other hand,

is used to address the conflict situation involved in the land acquisition process. The pertinent portions of the two models are summarized thus;

1. the participants in the conflict and their characteristics;
2. the neighbourhood in which the conflict takes place;
3. the grounds for the involvement of the participants and the outcome of the conflict;
4. the time of the diffusion of an idea;
5. the places in which the item or idea is located at first (t) called nodes of origin;
6. the places at which the item or idea is located at other successive times (t+1) called nodes of destination; and the path of movement;

Relating the two models to the problem, it is obvious that the participants in the conflict were the Krobo and their Akan neighbours; and the issue at stake was ownership over the land that the Krobo now occupy. A legitimate question then arises - why did the Krobo acquire the land from their Akan neighbours? This issue is the subject of the next section.

3:2 WHY THE KROBO ACQUIRED AGRICULTURAL LAND FROM THEIR AKAN NEIGHBOURS

Land acquisition and individual land ownership were originated by the Krobo in the middle of the nineteenth century (Hill, 1961). An attempt was made in the field to ascertain the reason why the Krobo started land acquisition from their Akan neighbours.

Unfortunately there were no people living today who took part in the land acquisition process at its initial stages. The descendants of these people were however interviewed. The assumption was that the motive for land purchase by the Krobo has not changed over the years. On the whole 200 elderly farmers were randomly selected for the interview. One hundred and fifty(150) of these respondents were chosen from the Manya Krobo District itself while 50 were from the Krobo enclaves in the forest regions of Ashanti, Brong Ahafo and Western Regions. The main hypothesis is that demographic factors including population growth, were the main motivative force behind agricultural land acquisition by the Krobo. The respondents were asked to give the reasons why they purchased land. The findings of the investigation are tabulated in Table 3:1

TABLE 3:1 REASONS FOR AGRICULTURAL LAND ACQUISITION BY THE KROBO

	REASONS	NO. OF RESPONDENTS	PERCENTAGE
1.	Population increase	101	50.5
2.	For children's support in future	42	21.0
3.	To grow commercial crops	44	22.0
4.	For prestige	13	6.5
5.	Every Krobo must have land	NIL	0
6.	For no particular reason	NIL	0
	TOTAL	200	100.0

SOURCE: From student's field study, June, 1988.

3:2:1 THE DEMOGRAPHIC FACTOR

From Table 3:1, it is evident that the Krobo acquired land mainly for population related reasons. One hundred and one (101) out of the 200 respondents indicated that the crave for land acquisition was the result of population increase. Nearly fifty-one per cent of the population therefore acquired land to avert population pressure or as a result of population pressure. Forty-two (42) respondents (21.0 percent) also indicated that land acquisition was essentially to provide support for their children in future. On the whole 71.5 per cent of the Krobo acquired land for demographic reasons. Supporting this finding, that the main motivation force behind the acquisition of land by the Krobo, are a number of accounts. Field (1943), for example, states that "the Krobo are a prolific people and every man who owns land strives, during his working life, to buy enough new land to enable each of his sons to inherit a farm without dividing his own". Field further compared the reproduction rate of the Akim Kotoku women with an average of two surviving children each to that of the Krobo women and stated that the "Krobo women averaged about five surviving children each" (Field, 1943, p.59). He concluded that "the new generation more than doubled the preceeding one". He then went on "the Krobo owned land increases as the population grows (Field 1943). It needs to be re-stated that the "sons" of a Krobo farmer are made up of his own male children, those of his unmarried daughters, his male slaves and at times his "strangers". That the main inducement for land acquisition by the Krobo is demographic is

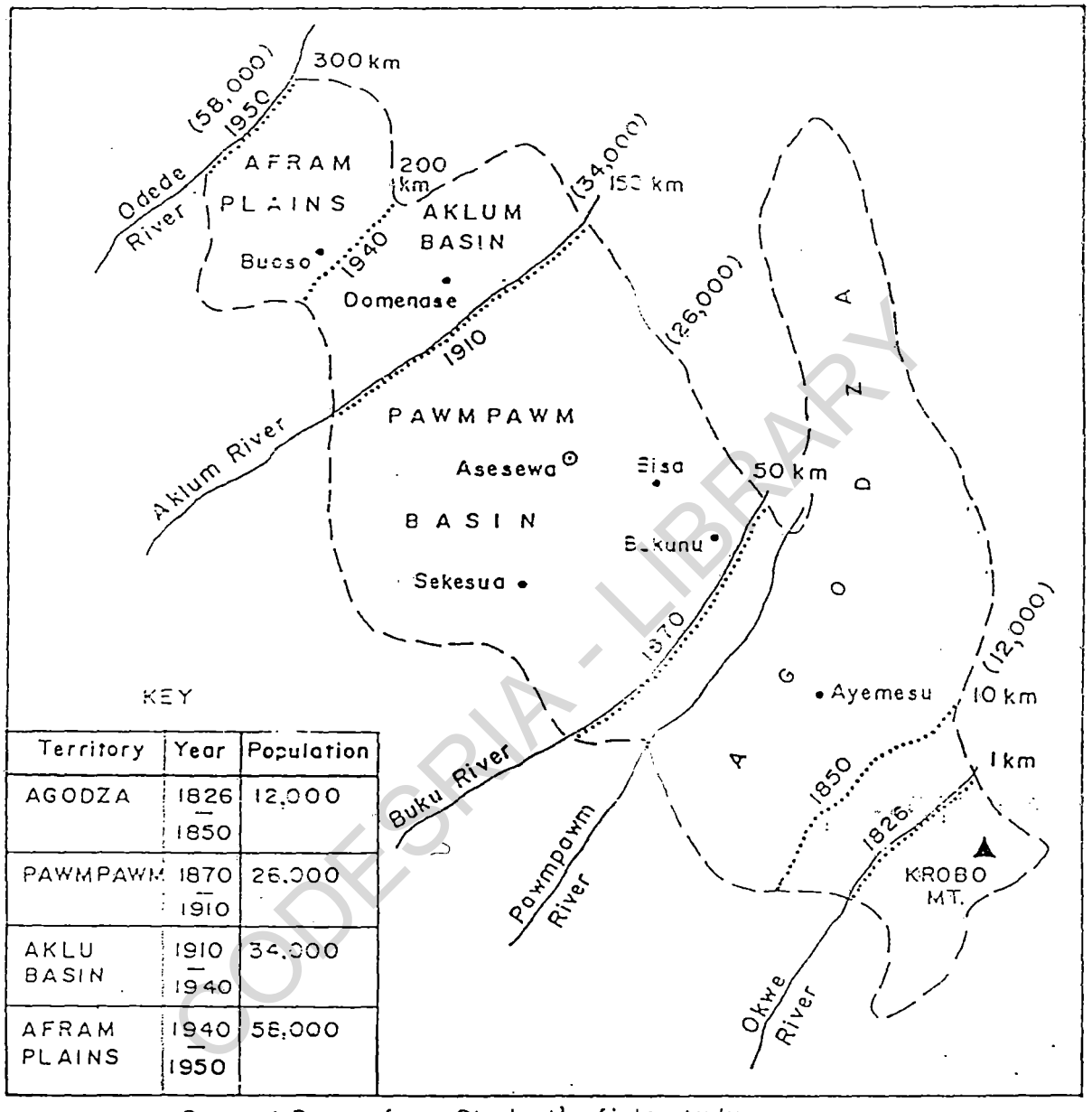
further supported by another account by Field that "the people have grown so numerous that they have been forced to spread and set up sub-centres of population" (Field, 1943, p.59). Thus, to Field, the land acquisition process of the Krobo is a strategy for releasing population pressure on the land. Odonkor also made reference to overcrowding on top of the Krobo Mountain at the time the people were expelled by Governor W.B. Griffith (Odonkor, 1971; Azu, 1926). The effect of such overcrowding on a population is articulated by Huxley, who referring to the psycho-physiological stresses arising in animals from overcrowding states that "This is of immense importance for man too; because, in him, stress manifests itself in mental instability and kinds of social and political disturbances (Hutchinson, 1969). The analysis of the relationship between the population growth and land acquisition is illustrated in Figure 3:1 which is based on Table 3:2.

TABLE 3:2 RELATIONSHIP BETWEEN POPULATION GROWTH AND LAND ACQUISITION

YEAR	DISTANCE FROM KROBO MOUNTAIN	POPULATION	REMARKS
1850	10km	12,000	
1889	50km	26,000	
1910	150km	34,000	
1940	200km	44,000	
1950	300km	58,000	

SOURCE: From student's field study.

Fig.3·1 A MAP OF THE MANYA KROBO DISTRICT SHOWING RELATIONSHIP BETWEEN POPULATION GROWTH AND TERRITORIAL EXPANSION



KEY

Territory	Year	Population
AGODZA	1826 — 1850	12,000
PAWMPAWM	1870 — 1910	26,000
AKLU BASIN	1910 — 1940	34,000
AFRAM PLAINS	1940 — 1950	58,000

Source: Drawn from Student's field study

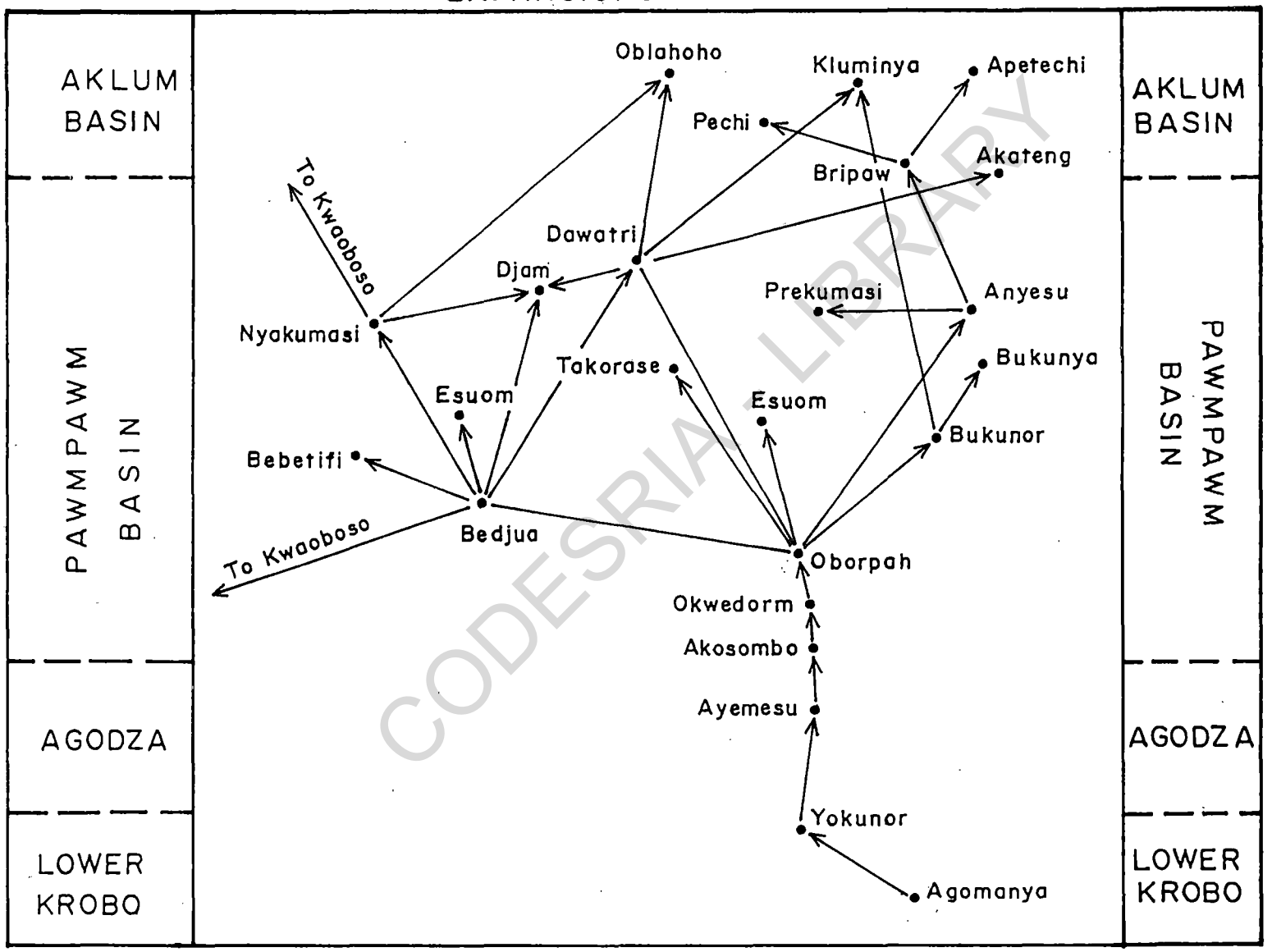
more than one wives to help them in their agricultural operations at the localities. For the same purpose, they needed many children. The situation was made more complex by the assimilation of strangers and slaves into the family system. The demographic phenomenon is illustrated in Figure 3:2.

From the field investigation, it was found out that at the time of the first generation, there was only one man who needed cultivable land to cater for a family.. By the time of the second generation, there were as many as 4 males in the family who were to be provided with farming land. The number of males in need of farming land by the time of the third generation increased to 16. This geometric progression character of the population has parallel impact on the land acquisition and territorial expansion in the district. At present, it is unlawful to own a slave and hardly desirable to adopt a stranger in the district.

To illustrate further the influence of population increase on land acquisition, the family tree of one man, Dapah, was studied in relation to the land acquisition process.

When the Krobo were expelled from the Krobo Mountain (Azu, 1926, p.40), Dapah first settled at Agomanya and later moved to Yokunor (Fig. 3:3). There, he had four wives and bought new lands at Ayemesu, Akosomo, Okwedom and Oborpah in the Agodza Mountain. The male children of the first, second, third and fourth wives inherited Dapah's land at Ayemesu, Akosomo, Okwedom and Oborpah respectively. In the Pawmpawm Basin, the numerous grandsons of Dapah spread out and acquired lands at Bedjua, Bukunor, Takorase,

Fig.3·3 THE FAMILY TREE OF DAPAH AND TERRITORIAL EXPANSIONS



Source: From Student's Fieldwork; Data collected June – October, 1988.

Esuom, Anyensu and Dawatrim. These places, in turn, became centres of dispersion for Dapah's great grandsons. These great grandsons purchased lands at Pawmpawmtifi, Nyankumase, Djamam, Prekumase and Kruminya. The next generation also spread out and acquired lands at Oblaho, Petchi, Akateng and Apetetchi. By the time of the present generation, however, the land acquisition process became constrained by a number of factors and some people started looking outside the district for new lands to cultivate.

The linear relationship between population growth and land acquisition, as outlined above, could be summarized in the following model for graphic appraisal.

E = df, X1, X2, X3, X4

where E is the rate of land acquisition and territorial expansion.

df is the demographic function

X1 is the growth of the population

X2 is the number of male children a man has.

X3 is the number of wives a man has.

X4 is the culture of the Krobo.

The land acquisition process in the Manya Krobo District, nonetheless, cannot be accounted for in terms of only demographic variables. As shown in Table 3:1 economic factors are also important.

3:2:2 THE ECONOMIC FACTOR

Forty-four (44) out of the 200 respondents (22:0 percent) claimed that they acquired land to grow cash crops such as cocoa and oil palm. This finding is supported by La Anyane who studied the Aweso Huza and observed that the main force behind the Krobo migration for land has been the urge to acquire virgin forest lands for the establishment of cocoa farms (La-Anyane, 1956). Kroboland is not far away from Akwapim where cocoa cultivation started in the country and the Krobo followed closely on the Akwapim during the period of cocoa cultivation. Polly Hill (1963) is also reported to have observed that increased cocoa prices led to increased acquisition of previously idle land (Stolper, 1960).

It is true that by 1865, the Krobo were growing oil palm on the piedmont of Agodza (Akwapim Mountain). Rev. E. Schrenk of the Basel Mission attested to this before the Select Committee on West Africa in 1865 (Dickson, 1971, p.144). Krobo oil palm plantations were also mentioned by Horton (1868). It is equally true that from about 1850, the importance of the oil palm tree in the district increased mainly due to increasing value of the palm oil in the country's overseas trade (Dickson, 1971, p.145). The oil palm was also basic to the agricultural production in Kroboland. By the turn of the century the oil palm continued to be carefully cultivated and the area's high quality produce attracted high prices (Gold Coast Government Gazette, July, 1913). Odonkor even gives an account of the Krobo paying their indebtedness to the government

with palm and kernel oil in the second half of the nineteenth century (Odonkor, 1971).

It is thus not to be doubted that the cultivation of cash crops, especially oil palm and cocoa constituted a great inducement for the acquisition of land by the Krobo. To a large percentage of the people, however, it was not the main motivative force behind the land acquisition process. These people claimed that prior to the introduction of these crops into Kroboland, the Krobo had already started acquiring land from their Akan neighbours. They observed that by 1826, land had already been acquired by the Krobo from their home mountain to the Okwe River. To the majority of Krobos, their crave for land was essentially a function of population pressure and their traditional desire to provide land as security for their sons who inherit them on their death. To many Krobos, the movement of their ancestors from the grassland in Lower Krobo into the forest lands was initially not to grow cash crops, but rather in search of fertile soil and more humid environment to grow more food crops, namely yams, plantain and cocoyam. La Anyane observes that the cost in output (time, energy and capital) of the production of "Ngma" (a type of millet), the Krobo traditional food, was far more in excess of the requirements for the other crops. Furthermore the plains were found to be dry and infertile and it was difficult to grow a large variety of crops and to subsist the year round on this land (La Anyane, 1958). Writing on the change from grain culture to root crop culture in the district, Field pointed out that though millet is dietetically superior to

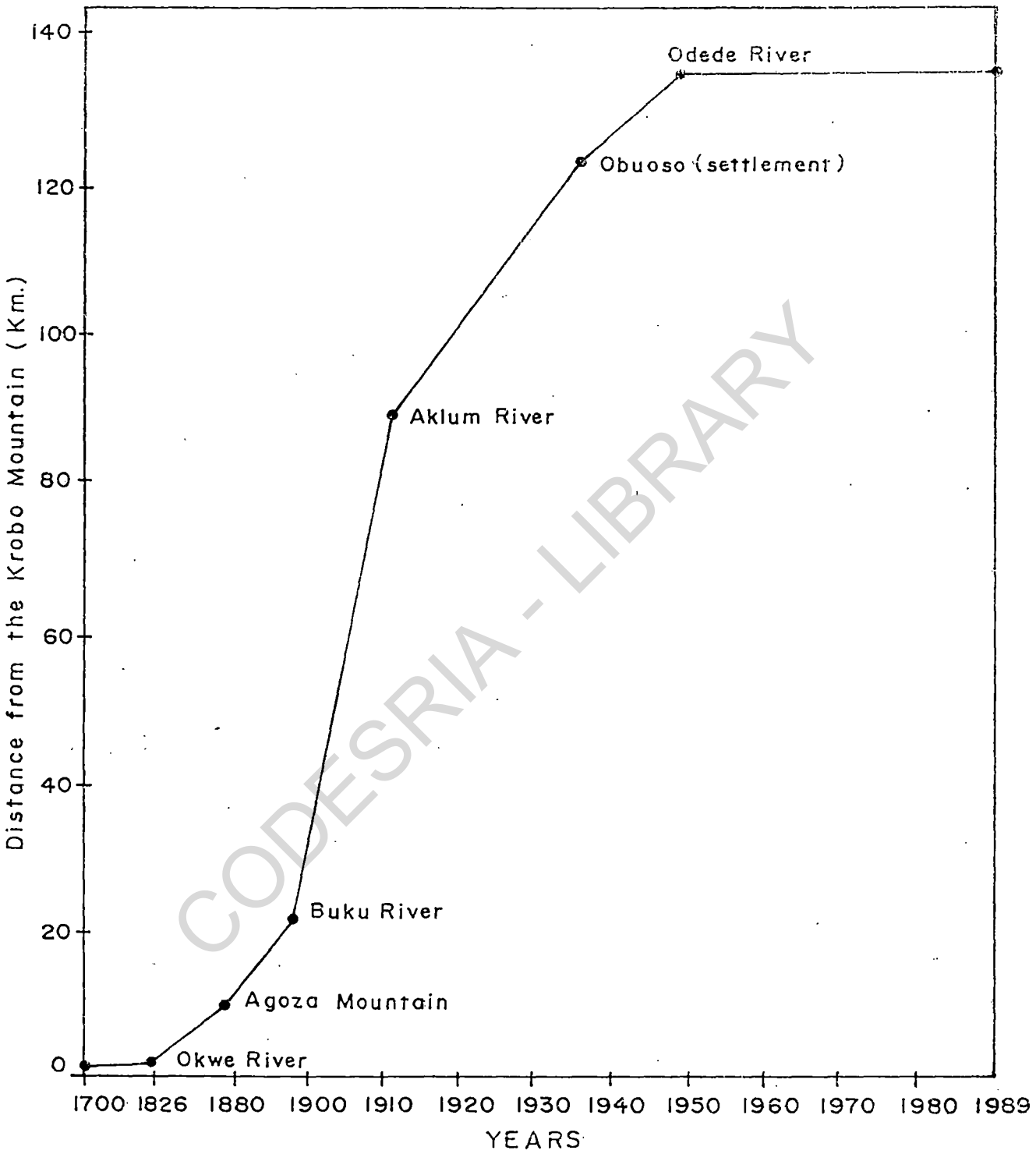
maize and root crops, it is a more uncertain crop and is more difficult to protect from birds; it also shows smaller returns in sheer bulk for greater labour (Field, 1943, p.58). In addition to the demographic and economic factors in the land acquisition process in the Manya Krobo District, there is the prestige variable which is addressed next.

3:2:3 THE PRESTIGE FACTOR

Thirteen (13) out of the 200 respondents (6.5 percent) gave prestige as the reason for land acquisition in the Manya Krobo District. Because of the importance of land in the farming system, it is prestigious for a farmer to personally own a tract of land for himself and his children (Hill, 1961). To many Krobos, therefore, land is an indispensable asset that needs to be acquired as a passage to adulthood. Landless Krobo farmers thus have little or no respect in the Krobo farming community. Indeed land ownership is one of the indices for assessing a man who claims the right to marriage. The prestige factor, nevertheless, is closely connected with the population factor in the land acquisition process; for, while a man acquires land for himself, he often has, in his mind, the security of his children in the future.

In conclusion, it is worth noting that though the Krobo acquired land for economic and social (prestige) reasons, the main motivative factor behind the rapid land acquisition process in the district is demographic. The land acquisition process, on the whole, had been chequered. The varying reaction of the Akan

Fig.3-4 GRAPH SHOWING RATE AND TRENDS IN LAND ACQUISITION IN THE MANYA KROBO DISTRICT



(Source : From Student's Fieldwork)

neighbours to the territorial expansion process of the Krobo and the changing fortunes of the cocoa and oil palm industries were identified by the respondents as the main factors that influenced the rate of the land acquisition process. In the context of the spatial diffusion model, these factors are considered as barriers in the land acquisition process and are examined as such below.

3:3:1 CHANGING AKAN ATTITUDE AND THE RATE AND TREND OF THE LAND ACQUISITION PROCESS

The attitude and response of the Akan neighbours to the land acquisition and territorial expansion processes by the Krobo are important factors that influenced not only the land acquisition processes, but also the general agricultural land use in the district. Border clashes that affect agricultural production; lengthy land litigations with heavy tolls on the time and incomes of the Krobo farmers, decreasing land holdings and land fragmentation; not to mention some Krobo rites that have great impact on agricultural land use could, in fact, be traced to the attitude and reaction of the Akan neighbours to the Krobo land acquisition and territorial expansion. There is therefore the need for an understanding of this factor in the land acquisition process for the full appreciation of the issues involved in the inter-relationship between population and agricultural land use in the Manya Krobo District. Figure 3:4 is provided to show the influence of the Akan neighbours in the land acquisition process.

Fig. 3:4 provides a line graph showing the rate and variations in the land acquisition process. Super-imposed on the graph are

Between 1826 and 1850, the Krobo acquired land from the Okwe River to Agodza, a distance of about 9 kilometres. This gives a LAII of 0.35. After the defeat of the Ashanti army at the Battle of Katamanso in 1826 (Azu, 1926, pp.23-24), the Krobo experienced relative peace and as a result of further increase in their population, they started penetrating Akan lands beyond the Okwe River (Odonkor, 1971). They nevertheless met intensified Akan resistance. As a result of the violence, cultivation here became very risky. Oklemekuku Azu Mate Kole, (late Konor of Manya Krobo (1939-1990) described the mode of land acquisition then as "acquisition by the cutlass". This expression describes the bloody nature of the land acquisition process. The clashes (Field, 1943, p.54; Azu, 1926, p.28) were not between the Krobo and their Akan neighbours only, but also among the Krobo themselves who had to struggle for farming land as a result of increasing population and scarcity of land. Thus Field's description of the Krobo penetration into the Akan lands as "bloodless invasion "(Field 1943, p.54) does not apply to the land acquisition process at the early stages.

Due to the very high risk involved in the land acquisition and cultivation at this stage, the Krobo had to evolve some survival strategies to protect the population. Two of these measures have become important features of the Krobo farming system.

1. In the early stages of Krobo penetration into Akan lands, it was the adult male who went first. They were followed by the

other categories of the population only when peace was established at the newly established farms.

2. The Krobo formed groups in which they went down their home mountain for cultivation. Though they had individual farms, they worked in groups rotating from one farm to another. On each occasion there was one sentry who warned of any approaching danger. From this beginning originated the land purchasing groups often called companies, generally associated with migrant farmers in southern Ghana.

From Agodza there was a substantial increase in the rate of land acquisition by the Krobo. A distance of 40 kilometres was acquired to the Buku River in a relatively short time of 20 years (Table 3:3 and Fig. 3:4). This gives a LAII of 2.00. In this area the mode of land acquisition changed from "by the cutlass" to a peaceful outright purchase. This change was the result of a change in the perception of the Akans from one of the land being a place for hunting and raids on Krobo farmers to a resource that could be peacefully sold for money (Azu 1926; Field 1943; Odonkor 1971).

The largest Land Acquisition Intensity Index is found between the Buku and Aklum rivers. The graph (Fig. 3:4) rises exponentially and steeply with a LAII of 2.50 between 1870 and 1910. Around 1870, the people of Begoro (Akims) entered the land sale deal with the Krobo. The rivalry which this entry of the Akims into the deal created among the Akan land owners gave the Krobo greater opportunity to purchase land peacefully and to

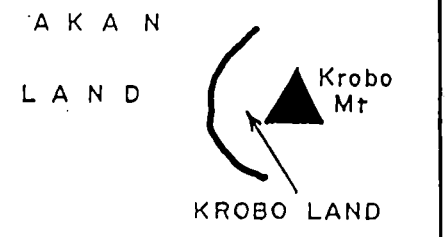
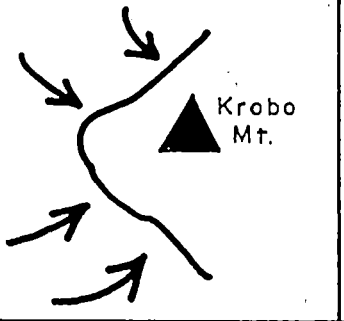
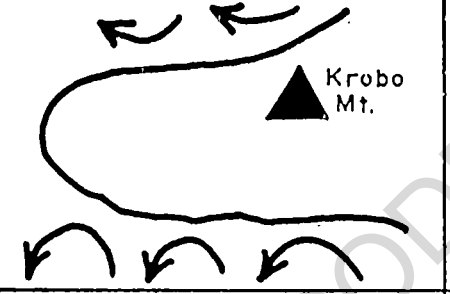
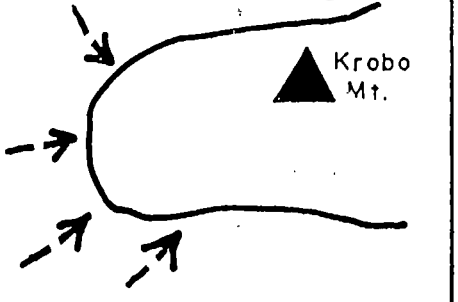
rise to uncertainty and insecurity in the land acquisition and cultivation processes.

From 1950 (Fig. 3:4), the land acquisition process dropped to nothing. Since then, the Akan landowners have refused to sell new agricultural land to the Krobo. Though they still want money from their land, they no more want it through outright sale. The described process of contiguous land acquisition by the Krobo from the Krobo Mountain and the changing levels of resistance offered by the Akans are diagramatically illustrated in fig. 3:5.

In this case study, within a conflict situation model, the finding is that the Krobo, induced by population pressure and aggravated by landlessness, were able to acquire land from their Akan neighbours at a time when the land in conflict was only marginal to the Akan economy. It may then be legitimate to hypothesise generally that, in a conflict situation involving ownership over an object, it is the party that has greater need for the object who wins.

Explanatory factors are generally gregarious, operating in groups. The land acquisition process was not only influenced by the changing attitude of the Akan neighbours, but also by the economic situation in which the process took place. In the following section, therefore, an attempt is made to assess the influence of the market economy, on the land acquisition process.

Fig.3·5 A DIAGRAM SHOWING STAGES OF THE KROBO LAND ACQUISITION PROCESS AND THE AKAN CHANGING ATTITUDE

STAGE I LOWER KROBO 	The Krobo own only limited agricultural land around the Krobo Mountain. The vast agricultural land to the north and northwest belongs to the Akan neighbours.
STAGE II AGODZA 	The Krobo start expansion into Akan land. The Akan resist the Krobo territorial expansion.
STAGE III PAWMPAWM BASIN 	Akan resistance withdrawn. Krobo penetrate deep into Akan land.
STAGE IV AKLUM BASIN & AFRAM PLAINS 	Akan resistance renewed and intensified End of Krobo territorial expansion – Further population increase, land shortages and landlessness. KEY Krobo land acquisition Front Akan Resistance Intensified Akan Resistance

Source: Student's Fieldwork

3:3:2 THE EXTERNAL MARKET ECONOMY AND THE LAND ACQUISITION PROCESS

The dominant crops grown for the external market during the process of land acquisition were oil palm and cocoa. Because of the greater importance of cocoa in the economy of the country, the history of the cocoa industry is used for the analysis. The history of the cocoa industry which is essentially confined to the twentieth century (Shepherd, 1936), is summarized below for the necessary analysis.

PERIOD	ACTIVITIES
1906 - 1915	Major expansion of the industry
1915 - 1918	Expansion curtailed as a result of the First World War on account of shipping and other difficulties.
Late 1919 - 1920	Expansion of industry accelerated due to higher prices.
1926 - 1927	Recovery of prices gave renewed impact to planting.
1933 - 1936	Little expansion due to world economic depression.
1939 - 1945	Little expansion due to the Second World War. There were shipping and other difficulties.
1947 - 1950	Another major expansion on account of world peace, improvement in transportation and higher prices.

SOURCE: Shepherd 1939 pp.4-6; Ghana COCOBOD. Dickson 1971 pp.165-171.

When the history of the cocoa industry is related to trends in the land acquisition process (fig. 3:4), some positive correlation is found between the rapid territorial expansion of the Krobo from 1870 to 1910 and the major expansion of the cocoa industry in the country from 1906 to 1915. It is therefore possible that the favourable conditions for the cocoa industry partly influenced the extensive acquisition of land from the Buku River to the Aklum River or in the Pawmpawm and Aklum Basins generally. The curtailment of expansion in the cocoa industry as a result of the First World War might equally have influenced the decline in the intensity of land acquisition between the Aklum River and Obuoso where the LAII dropped from 2.5 to 1.67. Elsewhere, there is no correlation to explain any positive relationship between the two variables. Thus, though external economic situations might have influenced the land acquisition process at various stages, they cannot explain all the variations in the process.

So far, the reasons why the Krobo acquired land from the Akan neighbours and the factors that influenced the land acquisition process have been examined. Focus in the next section is on the land acquisition processes themselves.

3:4. LAND ACQUISITION PROCESSES

3:4:1 POPULATION GROUPING FOR LAND ACQUISITION

One outstanding characteristic feature of agricultural land use in the Manya Krobo District is group formation for land

acquisition and settlement. To the Krobo, land acquisition and settlement are twin socio-economic operations that involve movement into, and settlement in, "foreign" lands, especially at the frontier. Very often, the newly acquired lands are distant from areas already settled by relatives. The situation is further complicated by the traditional unwillingness of the Krobo farmers to reside among foreigners for fear of their culture being contaminated and their population assimilated. Thus, right from the beginning of the cultivation of newly acquired lands, the Krobo moved into the forest where they set up their settlements away from the residence of their Akan neighbours. It is to ameliorate the risks involved in such early settlements and be able to ward off possible Akan raids that the Krobo farmers resort to group formation for land acquisition and settlement. Though this risk management strategy was adopted right from the beginning of the land acquisition process (p.114), it was from Agodza that it was perfected as a safe method for penetrating the Akan territory northwest of the Krobo Mountain. From Agodza, the groups became enlarged to meet the greater risks involved in settlements farther away from home.

The land acquisition groups formed by the Krobo and other agricultural communities in southern Ghana have interested a number of researchers over the past years (Field, 1943; La Anyane, 1958; Hill, 1961; Benneh, 1970; and Gyasi, 1975). Some researchers wrongly see these land acquisition groups as companies and are tempted to find in them the attributes of modern co-operative

movements (Hill, 1958 p.214; Field 1944, p.54). The field investigation revealed that these groups are not co-operative movements and that as soon as the land acquisition process is completed and the land is shared among the members of the group, the farmers begin to operate on individual basis. The groups are, however, very important in the demographic sense; they have continually re-distributed the population over the agricultural terrain from Agodza to the Afram Plains.

Claims are often made to the effect that patrilineage or blood relation is the basis for the formation of the land acquisition groups. Groups of different affiliations were, however, found in the field. An attempt is thus made here to ascertain the basis for the formation of the land acquisition groups in the district. The hypothesis is that group formation for land acquisition in the Manya Krobo District is based on wider considerations than mere patrilineal or blood affiliation. The respondents were asked to indicate their relationship to the person who informed them of the sale of the land they purchased. The responses are tabulated below.

TABLE 3:4 BASIS FOR GROUP FORMATION IN THE LAND ACQUISITION PROCESS.

RESPONSES	No. OF RESPONDENTS	PERCENTAGES OF SAMPLE SIZE
Paternal relations	98	19.6
Friends	96	19.2
Clan members (of the same sub-tribe)	41	8.2
In-laws	103	20.6
Huza members	114	22.8
Other maternal relations	27	5.4
No response	21	4.20
TOTAL	500	100.00

SOURCE: Student's field work.

In Table 3:4, the most important consideration for the formation of a land acquisition group is huza membership. One hundred and fourteen (22.8 per cent) of the 500 respondents got information about the sale of the land they have purchased through huza members. The huza, formed by a group of farmers who have purchased land in a locality, provides a system of close social relationship among the members. Information flows readily among the members of one huza. Information about the sale of a new land is therefore diffused among the huza members irrespective of their origin or political affinity. According to the respondents, it is often the rich people in the huza who are the first target of such information. This is because land acquisition generally involves

large sums of money. In a number of cases, it is the rich person who initially pays for the land. The other members of the group pay him later according to the size of their acquisition More often than not, people suspected of major social evils such as stealing, killing through "juju" or sorcery are the last people that could be informed of the sale of new land. Usually such people are excluded from the new groups. The choice of members for a new Huza is therefore selective with important personalities being the first target.

One hundred and three of the respondents (20.6 percent) received information about the sale of their land through their fathers-in-law or brothers-in-law. In the Krobo social system, there exists a cordial relationship among in-laws. A man with information about the sale of land thus contacts his in-laws whose interest he often tries to protect.

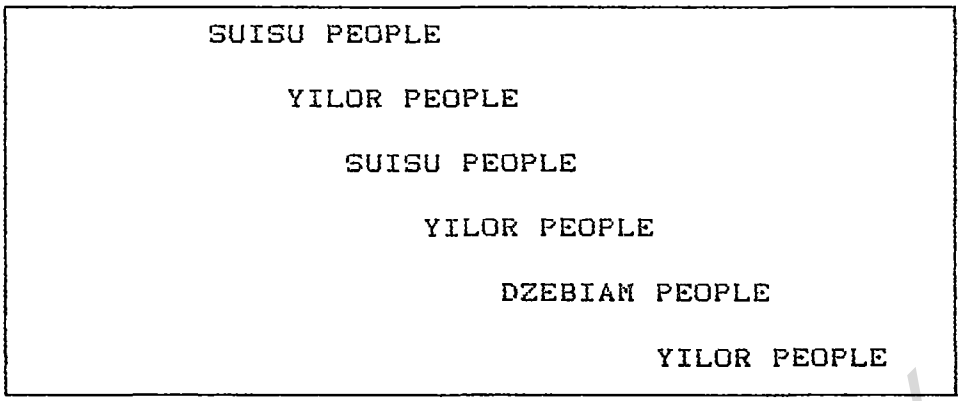
Paternal relations rank third according to Table 3:4. Ninety-eight (19.6 per cent) of the respondents heard about the sale of the land through their paternal relations. Among the Krobo, much importance is attached to paternal relationship principally because the system of inheritance is patrilineal. Owing to rivalries seated in the polygamous marriage system and other family differences, however, many paternal relatives are not informed about the sale of new lands and are thus excluded from the formation of new groups.

Friends also constitute an important target for information about land sales. Ninety-six (19.2 percent) of the respondents had

information about the sale of land through friends. Rich friends and others that can be trusted in times of need and trouble have priority in the decision taking process. One important attribute that qualifies a friend readily for selection into a group is valour. In the "foreign land" the need for a courageous person who could put up a strong and fearless defence in times of Akan attacks is always desirable.

Forty-one of the respondents (8.2 percent) received information about the sale of their land from their sub-tribe (clan) members. The importance of sub-tribe members in land acquisition group formation is found to be declining with distance from the Krobo Mountain. Up to the Buku River (Fig. 3:1), sub-tribe membership appeared to be very important. Here people of the same sub-tribe reside in a huza. The Djebiam (Yokwenya and Nam) of Ayemesu; the Djebiam (Nam) of Akosomo; the Djebiam (Yokwenya) of Okwedorm and Oborpah and the Dorm of Sapour are a few of the Huzas wholely settled by people of the same sub-tribe. Beyond the Buku river, it is not uncommon to find people of different sub-tribes residing in the same Huza. In such cases, however, whole sections of a Huza are settled by people of the same sub-tribe. Examples of such Huzas include Dawatrim, Brepaw, Nyakumase and Adefe. At the borders with the Yilor Krobo, a number of Huzas have people of the Manya and Yilor chiefdoms. Bedjua, Nyakumase, Trawa and Takunya are some of such Huzas (Fig. 3:6).

FIG. 3:6 POPULATION GROUPING FOR THE BEDJUA HUZA



SOURCE: Student's field work.

Beyond the Aklum River, the influence of sub-tribe (clan) affiliation in land acquisition grouping is virtually non-existent. The emphasis, at this frontier area, is essentially on individuals who are bold enough to ward off the frequent attacks.

In a few cases people from the maternal side, apart from the immediate in-laws are also included in the groups formed for land acquisition. Twenty-one (21) (4.2 per cent) of the respondents are in this category.

In sum, the finding of the investigation supports the stated hypothesis that the formation of groups for land acquisition is based on wider considerations than patrilineal or blood affiliation. Indeed in the Manya Krobo District, group formation for land acquisition is a careful decision-making selection process involving modalities with very wide considerations.

3:4:2. INDIVIDUAL LAND OWNERSHIP

Individual land ownership is basically the system of land holding in the Manya Krobo District. Four hundred and twenty-seven (85.4 percent) of the 500 respondents operate under the individual land holding system. Three hundred and twelve (312) (62.4 percent) of the respondent gave provision of land that could be inherited by their children as the main reason for the individual ownership of land in the district. All the respondents who operate under this individual land holding system indicated that they would strongly oppose any attempt to merge the individual holdings for large scale agricultural projects. Nearly seventy-eight percent (77.8%) of these people claimed that such projects would deprive them of their individual right in the land and erode the security that individual holding provides for their children. Fifteen (15.2) per cent of the people would also oppose any merger because of mistrust for other participants in the project. Five (5) percent of the respondents claimed that they would not allow any merger for fear of their ancestors (Huber, 1963, p.42). Thus in the Manya Krobo District, individual land holding is the basis of the agricultural system and any attempt at merging the individually owned lands for large scale agricultural ventures will be strongly resisted by the people. It will be argued in Chapter Five that the change from individual holding to family (weku) ownership is a function of population pressure and excessive fragmentation of land.

The individual holdings are clearly demarcated with "buna". The "buna" plant is a plant resembling Aspidistra. It is often

very difficult to find among other vegetation, but is tenacious of life and readily takes root when a slip is struck into the ground (Field, 1943). Additionally, "buna" is the plant used for erecting shrines for the gods. It is therefore assumed that anybody who tempers with a demarcating BUNA would surely be killed by the gods. As a result of this systematized demarcation procedure, individual holdings are in strips usually across the main stream. The agricultural landscape in the district, particularly in Upper Krobo, is thus made up of long strips of individual holdings demarcated with long lines of the BUNA plant. The point will be made in Chapter Four that as a result of population pressure and scarcity of land, people now temper with the BUNA lines giving rise to increasing number of border disputes and land litigation.

In his individual holding, a farmer builds his dwelling house with all the social amenities the family would need. These include family waste management system and footpaths to his farms. It is however the individuals and their private land holdings in a locality that form the linear settlement type known in Krobo as huza meaning farming line. ("Hum" means farming and "za" means line). It needs to be mentioned that despite the individual land holding system, there is a strong co-operative spirit among the members of a huza in terms of providing labour (hudom). An additional importance of the huza in the agricultural land use in the district is the involvement of the whole Huza in land dispute at the boundary with another Huza (YIPOHE). Performance of rites for the streams and rivers in a locality ostensibly to keep them

FIG. 3:7 STAGES OF TERRITORIAL EXPANSION AND POPULATION RELOCATION IN THE MANYA KROBO DISTRICT

STAGES	PROCESS	AGRICULTURAL ACTIVITIES	POPULATION CHARACTERISTICS
I INITIAL STAGE	Movement to the new holding to found a new HUZA	Beginning of farming activities:- 1. Clearing of forest 2. Planting of cash and food crops.	- Male of 25-50 years - Group settlement in the forest - No Dependency burden
II CONSOLIDATION STAGE	Movement to Individual holdings	- Weed control - Harvesting and - marketing of food crops - Some hunting	- Building of Individual houses. - Younger people (20-25yrs) join - Small household
III FULL DEVELOPMENT STAGE	Full Development of a Huza	Complex Agricultural Activity - Harvesting and marketing of crops - Clearing for new farms	Complex Population Structure: - Other people join - Increasing dependency Ratio - Larger houses - Increasing Room density - Development of Social Structures
IV DECAY STAGE	Movement of the youth to the new holding	Beginning of Agric Decay. - Shortening bush fallow - Declining yields - Land shortages	Population Pressure:- - Out-migration of youth to new holdings. - High dependency ratio - Decreasing Room Density.

SOURCE: Compiled from field investigation.

common defence against any attack. Otherwise during the day, they go to their individual holdings for agricultural activities.

The main agricultural activities at this stage are the clearing of the forest and planting of food and cash crops. Where the risk of attack from the neighbouring Akans is very high, the Krobo farmers, at this stage, resort to group work (katsu) on the farms in rotation. As it is not every member of the land acquisition group that settles on his land at this initial stage, the agricultural landscape is often made of cleared tracks interspersed with uncleared ones.

Stage II is when younger members of the families get involved in the settlement process. Other people between the ages of 20 and 25 join the group. The group is, however, still made up of only males. This is the time when more labour is needed in the settlement process. The individual families begin to move to their holdings where more permanent housing structures are erected. The households at this stage are normally small; that is about two or three males, and the age structure is generally made up of economically active people with little or no dependency burden. The main economic activities are harvesting and marketing of food crops. Hunting may be done to supplement farm earnings. This stage may be termed the consolidation stage.

Stage III is the full development stage. Other members of the family now join in the settlement process. The very old people, usually of 70 years and above and children of school going age (6 - 15 years) are however left at the old settlement. A polygamous

farmer may decide to go to the new settlement with only one wife, usually the youngest wife. At this stage the population structure becomes more complex with a number of children below 15 years of age included. The economies of the two settlements (the old and the new) are usually strongly inter-dependent.

Larger houses with increasing room densities are the general characteristics of the third stage of settlement. Conversely, in the old settlement, there is decreasing room density till the locality is gradually abandoned. So far, it is only Agodza that has experienced complete abandonment.

The agricultural activities at this stage become increasingly complex. The main activities include planting and harvesting of food crops; caring for and harvesting the cash crops, preparing produce for marketing; and clearing more forest for cropping. At this stage, food crops like yams, plantain and cocoyam become abundant at the new settlement making it possible for some to be sent to supplement subsistence at the old declining settlement.

A number of pertinent findings have been made in this chapter. The most important of these is that it was demographic factors, especially population pressure, that motivated the Krobo to acquire land from the Akan landowners. A further important finding is that behind the Krobo philosophy of individual land ownership, there is a strong desire, by the farmer, to provide during his life time, a personal land property which could be inherited by his male children. An additional finding is that the changing attitude of the Akan land owners to the Krobo territorial expansion and the

external market economy provided strong non-demographic influences in the Krobo land acquisition process. The investigation further revealed that the Krobo formed land acquisition groups as their survival strategy for penetrating the neighbouring Akan lands and that the basis for the formation of these groups is more complex than mere patrilineal affiliation. Lastly it has been found that the Krobo population moved into the newly acquired lands in the Akan areas in stages to protect the weaker members from possible Akan raids and other risks associated with early settlement in the forest. The next chapter relates population components to agricultural land use.

CHAPTER FOUR

POPULATION GROWTH AND AGRICULTURAL LAND USE CHANGE IN THE MANYA KROBO DISTRICT

4:1. INTRODUCTION

Mention has already been made of the rapid population growth in the Manya Krobo District. In many peasant communities, such rapid population growths are managed with birth controls to maintain the equilibrium (Grigg, 1973, p.138). In the Krobo agricultural community where large families are considered prestigious, however, birth controls are frowned upon (Bedele, 1987). In such a situation, the main traditional modes of reducing population stress on the land, in the past, were by the acquisition of new lands from the Akan neighbours and by population movement from the old huzas (ngmonya) to establish new huzas (hwehe) in the newly acquired lands.

The refusal of the land-owning Akans to sell more land to the Krobo from the beginning of the second half of the twentieth century therefore poses serious agricultural and population problems in the Manya Krobo district. This serious situation has further been aggravated by the inundation of a large portion of the already acquired agricultural land (about 228 square kilometres) by the Volta Lake. A third factor, which has already been mentioned, is the setting up of factories at Akosombo, Juapong and Asutsuare. These economic establishments have attracted a number of in-migrants who use Lower Krobo as a dormitory area (Bedele 1979,

pp.32-34). As a result of these developments, there is an increasing concentration of population in the Manya Krobo District. This population which is increasing has serious impact on the agricultural land use in the district. This chapter examines the agricultural land use changes resulting from the demographic factors. It, however, briefly discusses the comparative role of the main pertinent non-demographic factors in the agricultural land use change for a balanced assessment.

4:2 POPULATION GROWTH, LAND FRAGMENTATION AND LAND SHORTAGES

In the Manya Krobo District, land ownership is by direct acquisition from the Akan land owners or by inheritance. In the past, land inheritance was by the primogeniture system under which a farmer's land property passed on to his first male child (in a monogamous marriage) or to the first male child of each wife (in a polygamous marriage). The other children then had to acquire their own lands or their father acquired agricultural land for them elsewhere. This traditional arrangement for land inheritance was practicable at a time when there was abundant land that could be acquired and served as a catalyst for the rapid territorial expansion of the Krobo. Under the arrangement, too, the pressure on each tract of land was minimal and the level of land fragmentation on the death of a farmer was quite low. At present, as a result of scarcity of new lands to be acquired in the district, it has become desirable, and indeed traditional, to allot

each male child of a farmer a portion of the father's land property.

This new system of agricultural inheritance encourages progressive land fragmentation in the district. This is particularly so because a large number of people in the district today live on ancestral land. Thus the larger the family, the more fragmented the land becomes on the death of the original land owner. Because of the importance of inheritance in the land fragmentation process, the family system is examined below to throw light on who inherits in a family.

The extended family is the population grouping next to the sub-tribe in the Krobo social hierarchy. It is made up of people from a common parentage who are supposed to eat from the same bowl (KASI). Originally, people of a family lived in a common house and ate from the same bowl. Where they lived in different houses, they followed a system of nivenitsem (invitation for meals). In this system people in the various houses come together, to eat from the same bowl. This is to demonstrate the close relationship among the people. Generally, people in the family are of the same blood relation; though, in some cases, adopted slaves and strangers are incorporated. Basically, therefore, people of the same family are closely related; and with the exception of daughters who marry outside the family, they have common inheritance rights to property, including agricultural land. The degree of land fragmentation on the death of the original owner of the land and the size of each holding are thus dependent on the size of a

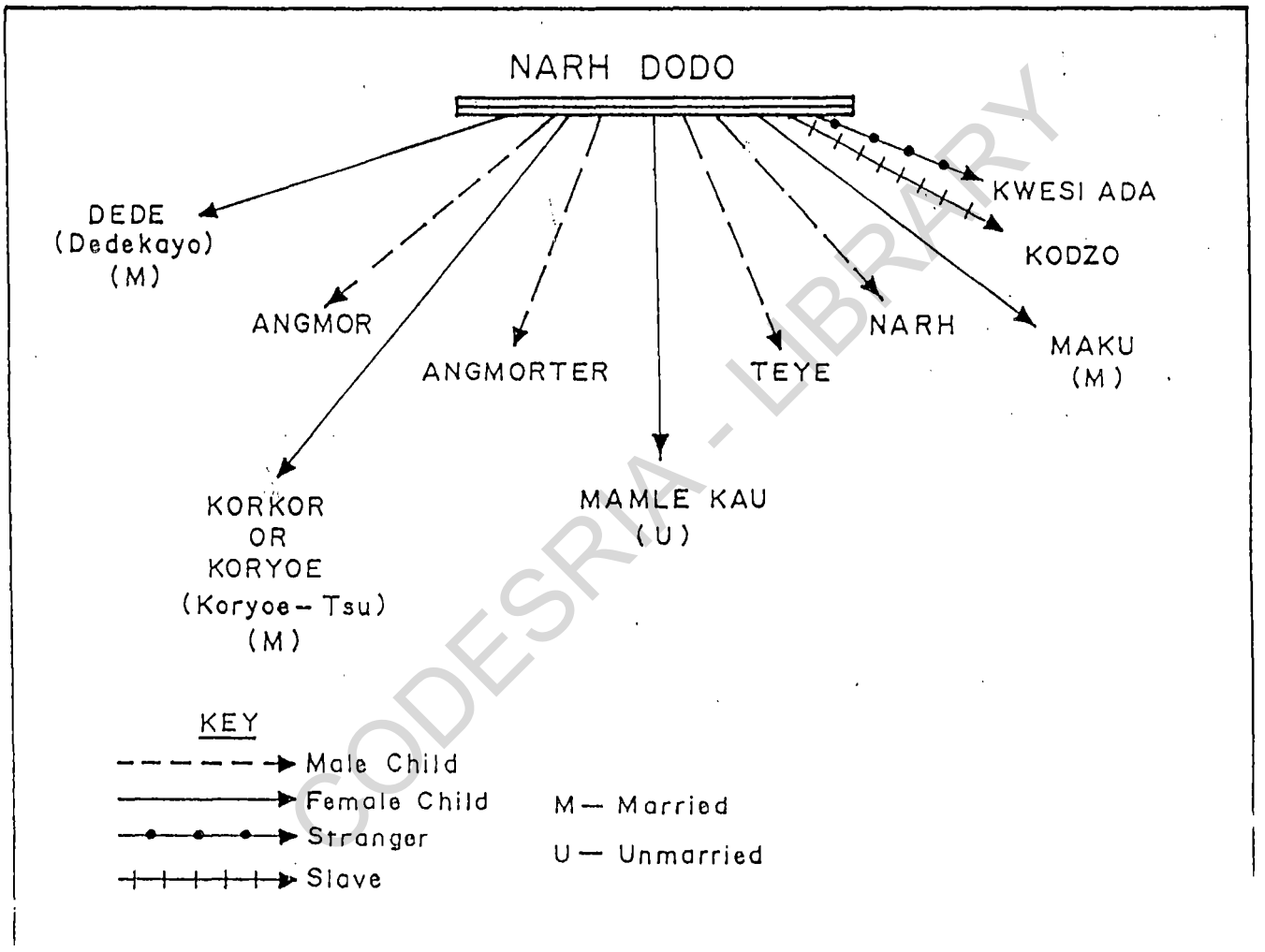
family. To identify the heirs to a man's agricultural land property, the composition of a family (the Narh Dodo family of Asitey Yokuwem) is shown in Figure 4:1 for illustration. It shows the land inheritance rights of the members of the family.

In Fig. 4:1, Narh Dodo is the original owner of land property that could be inherited by his descendants. The family is therefore named after him - NARH DODO FAMILY. Narh Dodo has four sons, namely, Angmor, Angmorter, Teye and Narh-Bio. All these sons can inherit his property on his death. Narh Dodo also has five daughters, namely, Dedekayoe, Korkor, Mamle, Maku and Ladzer. Dedekayoe, Korkor and Maku are married outside the family, thus they and their descendants cannot inherit any property, including land, belonging to their father. Mamle is unmarried and as a result, her children qualify to inherit her father. Narh Dodo also has one slave, Kodzo; and one stranger, Kwesi Ada, who have become traditionally adopted sons. These two people and their descendants equally qualify to inherit any landed property of Narh Dodo. Ladzer is given to the adopted stranger, Kwesi Ada, in marriage. She therefore belongs to the Narh Dodo family on the ground that she is a wife of a son of Narh Dodo and as such she is a member of the Narh Dodo family and her children can inherit her father.

The members of a family, so far as inheritance is concerned, therefore, are:

1. The man from whom the family emanates. He is the automatic head of the family.

Fig.4·1 FAMILY RECONSTRUCTION SHOWING FAMILY AFFINITY IN THE NARH DODO FAMILY (KASI)



Source : From Student's Fieldwork

2. The male children of a properly contracted marriage and their descendants.
3. The unmarried daughters and their descendants.
4. The adopted slaves and their descendants.
5. The adopted strangers and their descendants.

An unmarried daughter loses her right to inherit her father as soon as she becomes traditionally fully married. Any children that she might have had before the marriage (yobime) however, belong to the father's family to which they have inheritance right. Usually, however, the yobime usually inherit their grandfather's land property. Thus in Kroboland there is the saying that "YOBI LEE ENE SUGBA EYEO" meaning it is the land of the grandfather that the child of an unmarried woman inherits. From this illustration, it could be seen that in the Krobo social system, there is adequate provision made for both patrilineal and matrilineal inheritance though the patrilineal arrangement is more preponderant.

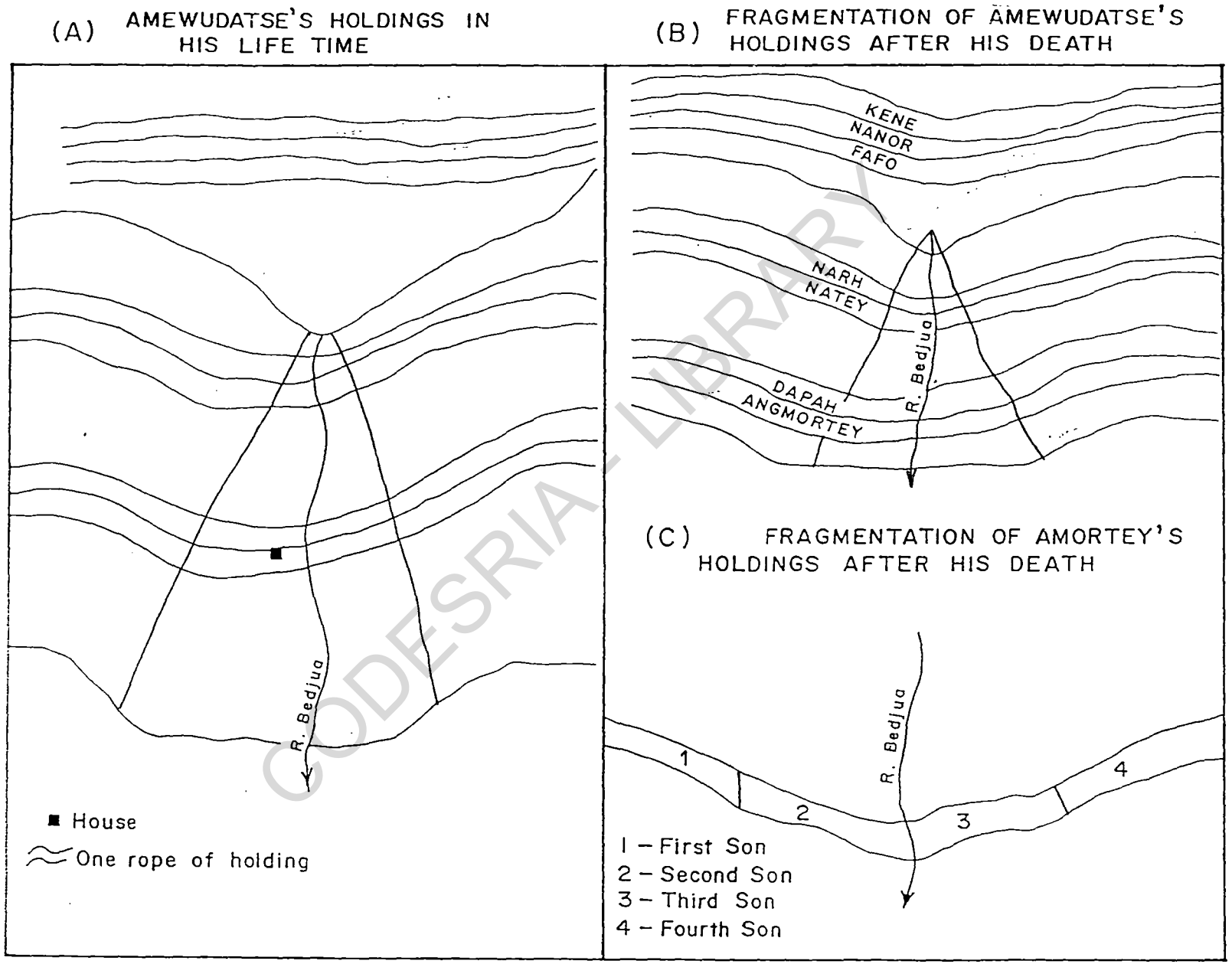
This provision in the social system of the Krobo influences a man's acquisition of agricultural land during his lifetime. The larger the number of his male children, and his unmarried daughters, the more agricultural land he tries to acquire. It needs to be noted however that it is not every child who can inherit his father. In the Krobo marriage system, there is a rite known as FIA. In a marriage union where this FIA is not performed, the children of the union cannot inherit their father. They belong to the woman's family to which they have inheritance right. In recent

times, however, a provision, lapom, has been instituted that transfers such children and their inheritance rights to the father's family. Where a man has no children of his own, the family decides who should inherit his landed property (Huber, 1963).

This system of inheritance encourages progressive fragmentation of a farmer's tract of land on his death. Figure 4:2 illustrates the process of progressive land fragmentation in the Manya Krobo District. Figure 4:2(a) shows the land property of a farmer, Amesudatse Narh at the time of his death. He had seven ropes of land (about fifty-five hectares) at Bedjua and three ropes (about fifteen hectares) at Osonso. At the time of his death in 1955, he had ten people who qualified to inherit his land. Each inheritor thus had about five hectares of land. Three of these inheritors had to leave Bedjua to settle at Osonson, for, in the Krobo agricultural tradition, it is desirable for a farmer to settle on his own holding (Fig. 4:2(b)).

Fig. 4:2 (c) shows the extent of land fragmentation at the time of the grandchildren of Amewudatse Narh. At the time of his death, one of the sons, Angmortey, had four people who could inherit him. His one rope of land was therefore allocated to these four people; and each inheritor had only one quarter of a rope (about 1¼ hectares). It became uneconomical to demarcate the tract of land length-wise, as is usually the case. Instead, the demarcation was done breathwise. The other sons of Amewudatse Narh had their holdings similarly fragmented on their death. The

Fig. 4·2 POPULATION GROWTH AND FRAGMENTATION OF AMEWUDATSE LAND



Source: From Student's Fieldwork

situation is now very critical. Nate-Bio, the first male child of Angmortey has five male children with whom he lives on his small piece of land. Thus with time, the individual holdings in the Manya Krobo District are progressively losing their agricultural viability. Consequently, there is widespread landlessness and agricultural under-employment in the district.

4:3 POPULATION GROWTH, CHANGES IN FREQUENCY OF CROPPING AND DECREASING FALLOW PERIODS

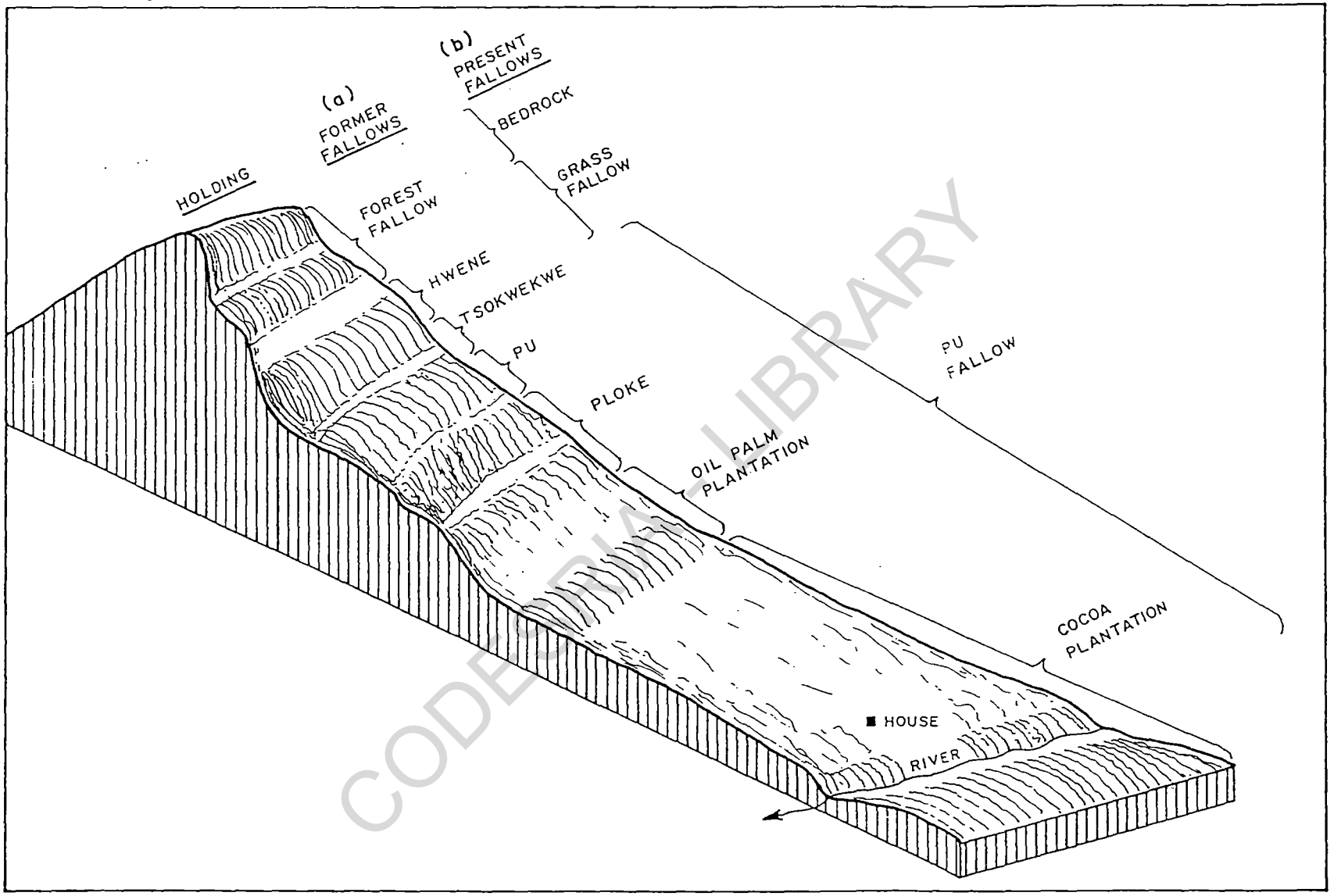
The agricultural system in the Manya Krobo District depends largely on the fallow for replenishing the lost nutrients to the soil. In the past this was done in two main ways. First, when there was much land for acquisition and the population was not only small but also sparsely distributed, it was possible to practise shifting cultivation. Large tracts of land were abandoned after about 20 to 25 years of continuous occupation. Thus areas like Lower Krobo and Agodza experienced partial or total abandonment until the beginning of the second half of this century. Agodza, in particular, was virtually abandoned from about 1910 for about half a century when new agricultural land was acquired in the Pawmpawm and Aklum Basins. It therefore became possible for the vegetation to regrow into a thick secondary forest and the land to regain its fertility naturally.

Secondly, within an area of active agricultural practice, the bush-fallow system of agriculture was practised. While under the shifting cultivation system there is change of residence from the old land to the new, under the bush-fallow system, there is no

change of residence and the land is cultivated in rotation. Under this system, fallows of different types and durations could be found. The newly acquired land was generally much larger than a farmer's yearly farm requirement. In the initial stages of colonizing a newly acquired land, therefore, a farmer cultivated only a portion of land he would need for the year or season. More often than not, the cultivation started from the settlement and portions of the forest were systematically cleared for cropping. The uncleared portion of land remained as forest fallow. Within the cultivated area, there was the bush fallow. A number of sub-fallows could also be found in the bush-fallow (Fig. 4:3 a-b). These are "PU", "PLOKE" and "TSOKWEKWE". Thus, in the agricultural system in the Manya Krobo District, in the past, fallows such as Forest, Secondary forest, "ploke", "pu", and Tsokwekwe" could be identified. The forest fallow was never cultivated. The secondary forest fallow was left uncultivated for between 25 and 50 years; the ploke fallow was between 10 to 20 years; pu fallow was from 2 to 10 years and Tsokwekwe was a fallow for only 1 to 2 years.

As the forest fallow was never cultivated, there was a full development of the tropical rainforest with large buttresses and long stems. The forest was open and stratified and under it there was large accumulation of bio-material which provided manure for the soil. Such forest fallows were cleared for the cultivation of cash crops such as cocoa and oil palm and food crops such as yams, plantain, cocoyam and at times cassava. The secondary forest fallow was similarly used. The ploke fallow was essentially for

Fig. 4·3 A HOLDING SHOWING TYPES OF FALLOW



Source: From Student's Fieldwork

the cultivation of food crops, especially yams, plantain, cocoyam and to a limited extent, cassava. The tsokwekwe fallow was a food crop farm derived from a forest or ploke fallow from which crops continued to be harvested. It was usually left to grow into a ploke or pu fallow. Pu fallow was for the cultivation of food crops mainly.

Now, as a result of population stress and increased intensity of cultivation, the forest and ploke fallows have been completely eliminated. With the elimination of these fallows, the tsokwekwe fallow has been automatically eliminated. Pu is now the dominant fallow in the district. To assess the length of the various 'pu' fallows, simple fallow surveys were conducted at three different places in the district. The surveys were conducted in May and June, 1989. These months are at the middle of the main growing season in the district and there is maximum cultivation of the land. The various fallows were cummulatively measured along the lorry road from Adome to Ayemesu (10 kilometres), from Asesewa to Seseamang (10 kilometres) and from Sekesua to Adwenso (10 kilometres) (Fig. 4:4). The details are provided in Table 4:1.

TABLE 4:1 LAND USE (FALLOW) INDICES FOR THE MANYA KROBO DISTRICT

TYPES OF FALLOW	ADOME TO AYEMESU		ASESEWA TO SESEMANG		SEKESUA TO ADWENSO		AVERAGE COMM. LENGTH	MEAN %
Under Cultivation	Comm. length (km) 4.3	% of Total length 43.0	Comm. length (km) 5.2	% of Total length 52.0	Comm. length (km) 4.5	% of Total length 45.0	length km 4.7	46.7
1 Year fallow	2.4	24.0	2.2	22.0	3.7	37.0	2.7	27.6
2 year fallow	1.2	12.0	1.6	16.0	1.1	11.0	1.5	13.0
3 year fallow	1.3	13.0	0.6	6.0	0.5	5.0	0.7	0.8
4 year fallow	0.8	8.0	NIL	0.0	0.2	2.0	0.3	3.3
5 year fallow	NIL	0.0	0.4	4.0	NIL	0.0	0.1	1.4
Over 5 year fallow	NIL	0.0	NIL	0.0	NIL	0.0	NIL	0.0
TOTALS	10.0	100.0	10.0	100.0	10.0	100.0	10.0	100.0

SOURCE: Computed from field investigation.

The survey showed that about 46.7 percent of the land was under cultivation during the season; 27.6 percent was under one year fallow; 13 percent was under 2 years fallow, 8 percent was under 3 years fallow, 3.3 percent was under 4 years fallow and only 1.4 percent was under 5 years fallow. There was no land under more than 5 years fallow. The most prevalent fallow, according to the survey, was one year. This short fallow period poses very serious problems for any effective agricultural land use in the district.

This is particularly serious as there is the need for between 8 and 10 years fallow for any effective cultivation in the district (Brammer 1967). The seriousness of the situation is equally demonstrated by the finding that as much as 46.7 percent of the land had to be cultivated in one season as a result of the large population. It is to be noted that the district has two growing seasons; a main season (Ahalabata) from March to August, and a minor season (Mawule) from November to December. The percentage of land cultivation in a year therefore could increase to about 52 percent. Table 4:2 gives an idea of the seriousness of the fallow situation in the district.

TABLE 4:2 LAND USE INTENSITY SCALE

Percentage of land under cultivation	Implication	Land use Intensity
100	Permanent Cultivation	Extreme Pressure
75	Less than 1 year fallow	Very, very, high pressure
46.7 -50	1 year fallow	Very high pressure
25	4 years fallow	High pressure
20	5 years fallow	Moderately high pressure
10	10 years fallow	Critical land use/ Density. Optimum fallow.
5	20 years fallow	Low Pressure.
0	No cultivation	No Pressure.

SOURCE: Student's own computation but based on Brammer's estimation of 10 years fallow requirement for any effective cultivation at Agodza.

very high population pressure. At Agodza, the rate of fallow decline is particularly alarming; for only about 25 years ago, there was a 50-year fallow which was the result of long abandonment. This fallow has declined rapidly to only 1 to 4 years fallow. It is being argued that this rapid decline of the fallow has been the effect of the very high population pressure. The very high land use intensity induces environmental degradation in the district. In the next section, vegetation succession in the district as a result of population stress is examined to illustrate the nature of environmental degradation.

4:4 POPULATION GROWTH AND ENVIRONMENTAL DEGRADATION

The importance of natural vegetation in agricultural land use can hardly be overstressed. Vegetation cover, in addition to its soil conservation role, provides bio-material for natural manure which improves the fertility of the soil. Soil water preservation and conservation are other invaluable roles that vegetation cover plays in the agricultural system.

The field investigation in the Manya Krobo District has shown that there has been a gradual degeneration of the vegetation as a result of very intensive land use which, in turn, is the result of population pressure including external demand. With the exception of Lower Krobo, the Krobo settled in every locality when there was forest cover. It has already been stated that as a result of the intensive cultivation, the vegetation has passed through a succession of forest and secondary forest, thick bush (Ploke), and

light bush (Pu). At a number of localities, particularly in Lower Krobo and on the high slopes in Upper Krobo, large tracts of grassland are found. The relationship between population increase and vegetation succession in Kroboland is shown in Table 4:3.

TABLE 4:3 RELATIONSHIP BETWEEN POPULATION INCREASE & VEGETATION SUCCESSION IN THE MANYA KROBO DISTRICT

YEARS	POPULATION	VEGETATION
UP TO 1850	12,000	LOWER KROBO: Thicket and grass UPPER KROBO: Forest
BY 1900	26,000	LOWER KROBO: Thicket and grass UPPER KROBO: Forest
BY 1910	34,000	LOWER KROBO: Thickets and grass UPPER KROBO: Forest & thick bush (ploke)
BY	58,000	LOWER KROBO: Light thicket 1950 UPPER KROBO: Forest ploke and Pu'
BY 1960	98,000	LOWER KROBO: Grass & thicket UPPER KROBO: Bush (Ploke & Pu)
BY 1970	113,000	LOWER KROBO: Grass & Light thicket UPPER KROBO: Bush (Pu) & Grass
BY 1984	135,000	LOWER KROBO: Grass and light thicket UPPER KROBO: Bush (light 'Pu') & grass

SOURCE: From field investigation.

Since about 1960, certain plants have come to be identified with the bush (Pu) that has been the predominant characteristic of the vegetation in the district. First, there appeared in the bush

fallow the plant Agblafo (Datura metal) around 1950. This was replaced in the district by Dzukwewi Apunyutso (Lantana camara) which was also superseded by "Acheampong" (Chromolaena odorata) and now "JJ" (tall grass). The rapid degeneration of the vegetation in the district can be explained, in addition to population pressure, by the method of vegetation clearing for cropping by the farmers and by the frequent bush fires of recent years.

The main method that the Krobo use for clearing the land for cropping is the slash and burn. At the beginning of the farming season, the farmer slashes the vegetation cover where he intends to grow his crops. The slashed vegetable matter is then burnt when it is dry. The intense heat produced by the burning process retards any regrowth on the patch of land. It is the increasing frequency of the slash and burn practice, which is the result of population stress, that induces the rapid degeneration of the vegetation. Additionally the Dzukwewi Apunyutso, Acheampong and the "JJ" grasses are all plants that burn readily when they are dry. Their emergence in the vegetation, therefore, brought into the agricultural system fierce annual bush fires. These bush fires destroy the young plants and retard the growing process of the big trees. Grass is now predominant at the higher slopes of localities like Bedjua, Otrokpe, Osonso, Bripaw, Dawatrim and in Lower Krobo.

The progressive succession of the vegetation in the district has led to the lowering of the water table in many localities. Many of the once parennial streams have now become intermittent causing serious water shortages in the dry season. Many man-hours

that could have been utilized for raising crops are rather used in search of water for domestic and dry season farming purposes. Furthermore, the torrential tropical rains, without much check by the vegetation, wash down much of the soil nutrients and render the land less productive. Thus, as a result of population stress and its resultant effects, the Manya Krobo District is experiencing rapid environmental degradation that needs to be reversed.

4:5 POPULATION INCREASE AND CHANGING LAND HOLDING PATTERNS

Landlessness is a relative agricultural land use phenomenon in the Manya Krobo District. Within the district itself, there are holdings of absentee farmers. Many of these absentee farmers are the educated persons or people who are too old to personally cultivate their holdings. At the periphery of the district, there are also tracts of land still owned by the Akan neighbours. Though these Akan land owners are no more willing to sell their lands outright to the Krobo, they are prepared to give them out under an arrangement which allows them to have a portion of the yields annually. There are other lands owned by individuals who have inherited too many holdings than they can cultivate in a year. Thus while there are a large number of people who are landless or have holdings that are too small for any meaningful and viable cultivation, there are uncultivated holdings that need labour to work them.

The prevalence of these complementary situations in the agricultural system has made desirable the adoption of the share-

crop system, under which the tenant cultivates the land and shares the yields with the holder according to an arrangement agreed upon by the two parties. This arrangement makes it possible for the landless farmers to get some yield without owning the land and the land owners to derive some yield or financial benefit from their holdings without cultivation them personally.

Share-cropping is not a novelty in the country (Benneh, 1973). It was in operation in the district in the past under rare conditions in which a farmer, due to poor health, could not cultivate his land himself. The increasing popularity of the arrangement in the district is the effect of the population pressure. When the pressure was not great, the yield from a farm was divided into three with the landlord taking one third and the tenant two thirds (Abusaa). With increasing population pressure and land shortages, the yield is shared equally (Abu-nu). This land holding arrangement is rapidly eliminating the isolated tracts of uncultivated land in the agricultural landscape.

Lease holding is also gaining increasing importance in the agricultural land use system in the district. As a result of the high demand for agricultural land, some land owners are prepared to lease parts of their land to people who want them. Usually the land is leased out in ropes, locally called kpa. One rope is roughly the equivalent of 5 hectares. The lease value of one rope changes with time and reflects the level of land shortage which, in turn, is partly due to population pressure. The field investigation revealed that in the 1950s when there was much land,

leasehold was not popular in the agricultural system. Most people cultivated their own holdings. By 1970, land shortages and landlessness became evident and lease value was about ¢2,000 a rope. With further increase in the population pressure, lease value now ranges between ¢4,000 and ¢8,000 a rope according to the length of the fallow period of the tract of land.

Owing to increasing population pressure on the land, a greater number of land owners tend to have preference for share-crop holding than the leasehold arrangement. Land owners consider returns from the leasehold arrangement minimal and take that option only under a pressing need for funds to settle immediate individual or family bills.

4:6. POPULATION INCREASE AND DECREASING CROP YIELDS

Successive declining crop yields have become a characteristic feature of the agricultural system in the Manya Krobo District. This declining process is evident in both cash crop and food crop farming. For nearly a century (ie from 1850 to about 1950), the Manya Krobo District was an important cocoa and oil palm growing area in the country. Traditional markets like Akuse, Otrokpe, Apimsu, Bisa, Sekesua and Asesewa were once important cocoa and palm oil purchasing centres. In the second half of the twentieth century, however, the district has lost its role as an important cocoa and palm oil producing area. Akuse, Bisa, Apimsu, Otrokpe and Sekesua have all ceased to be important purchasing centres of these cash crops (Quayson, 1990). The cocoa and palm oil

purchasing figures at Asesewa from 1951 to 1981 are provided in Table 4.4 to illustrate the declining importance of the two cash crops in the district.

Table 4.4 COCOA AND PALM OIL PURCHASES AT ASESEWA 1951-1989

YEARS	COCOA (METRIC TONNES)	PALM OIL (BARRELS)
1951 - 60	517	943
1961 - 70	433	767
1971 - 80	361	627
1981 - 89	328	492

SOURCE: Research Division (Agronomy) of the Ghana Cocoa Board, Cocoa House, Accra and Ghana Agricultural Dept. (crops) Agricultural Extension Service, Odumase Krobo.

In Table 4.4, cocoa purchases dropped from 517 metric tonnes in the period 1950-1960 to 338 metrictonnes in the period 1981-1989. It could be argued that the declining production of cocoa in the district is the result of the swollen shoot and capsid diseases which became very destructive in the Eastern Region since the 1940s and not the effect of population pressure. Yet the effect of the desiccating conditions created by the population induced vegetation degradation on the cocoa industry in the district cannot be ruled out. It will, however, not be meaningful to attribute the declining palm oil production in the district to population pressure. The Krobo farmer still has tracts of oil palm plantations, for, in the Krobo tradition, farmers reserve some palm trees as security against their burial. The declining palm oil

In Table 4.5, cassava experienced successive declining yields from 1980 to 1989. In 1980 cassava yield in the district, as a whole, was 13.2 metric tonnes per hectare. In 1986 the yield dropped to 11.4 metric tonnes per hectare. That was a drop of 13.6 per cent. By 1989 cassava yield decreased further to 9.5 metric tonnes per hectare. That gave 16.7 per cent decline. The total cassava production also suffered decline from 216,000 metric tonnes in 1980 to 129,000 metric tonnes (40.3 per cent), in 1986 and 114,000 metric tonnes (11.6 per cent) in 1989. Maize experienced similar decline in both total production and yield per hectare during the period.

In 1980, total maize production of 25,000 metric tonnes declined to 24,000 metric tonnes (4 per cent) and yield per hectare was only 1.6 metric tonnes (33.3 per cent decline). In 1989, maize production had dropped to 20,000 metric tonnes (20 per cent decline) while yield per hectare was 1.2 (25 per cent decline). There was a further decline to 100 metric tonnes (17.4 per cent) in 1989. In that year, yield per hectare dropped to 1.0 metric tonnes (33.3 per cent).

Total vegetable production in 1980 was 24,000 metric tonnes and yield per hectare was 8.9 metric tonnes. Total production dropped to 22,000 metric tonnes (8.3 per cent) in 1986 while yield per hectare also declined to 8.1 metric tonnes (9.0 per cent). In 1989, total vegetable production was only 16,000 metric tonnes (27.3 per cent decline) while yield per hectare was 6.0 metric tonnes (26.0 per cent decline). A high percentage of the decline in

crop yield in the Manya Krobo District could be explained in terms of population stress and land degradation.

4:7 POPULATION GROWTH AND AGRICULTURAL LAND USE INTENSIFICATION

In the Manya Krobo District, population stress has induced agricultural land use intensification. The main manifestations of this agricultural phenomenon are the cultivation of marginal lands, and the application of fertilizers. These are discussed in detail in this section.

4:7:1 CULTIVATION OF MARGINAL LANDS

Marginal land is operationally defined as any land set aside for functions other than agriculture or which is perceived by the agricultural community as unsuitable under a particular agricultural land usage. Forest Reserves, the steep slopes of mountains and the banks and sources of rivers were some of the lands perceived as marginal in the Krobo agricultural system in the past.

By 1927, Agodza, as a physical division in the district, was abandoned for new agricultural lands in the Pawmpawm Basin. The land on the higher slopes of the mountain was then set aside as part of the Volta River Forest Reserve (Amartefio, 1965). For about 50 years, the reserve remained fallow and developed into a thick secondary forest.

In late 1960s the influx of migrant workers into Lower Krobo as a result of the establishment of factories at Akosombo and

Asutsuare increased the population from 26000 in 1960 to 36000 in 1970 (Bedele, 1979). This increased the need for food crops substantially and the forest reserve at Agodza was released for cultivation under the "Taungya" system (Amartefio, 1965).[1] As a result of the population pressure and land shortages, however, the Taungya system of cultivation was ignored by the farmers who put the land under intensive cultivation and refused to plant the required quick regenerative plants. Now Agodza has been so intensively cultivated that the fallow has reduced to only 1 - 4 years. This exposed the high slopes to serious erosion hazards that have made it necessary to re-introduce the forest reserve.

Under the Krobo agricultural system, the main rivers are perceived as gods. The shrines of these river gods are often located at the source of the rivers and clearing the vegetation at the source or the banks of the rivers is prohibited by the priests of the shrines. The objective of this prohibition is to protect the shrines and prevent the rivers from drying up as a result of desiccating conditions along the rivers.

With increasing population pressure and land shortages in the district, these riverine lands gradually came under intensive cultivation for the production of vegetables. Though the practice was initially strongly opposed by the priests of the shrines, with increasing population stress, the objection to the use of such lands for agricultural purposes is rapidly giving way.

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[1]The "Taungya" system of farming is a form of forest plantation whereby salaried workers are allowed to grow subsistence crops while the newly planted trees are maturing.

About ten(10) per cent of the people interviewed argued that it was the increasing christian influence in the district and its resultant disregard for the shrines that motivated the cultivation of these marginal lands though they did not deny the existence of population pressure in the area. Another group (about 16 percent) also contended that it was the introduction of vegetables like tomatoes, pepper, okro and beans that necessitated the cultivation of the riverine lands. A large proportion of the population (about 74 percent) however, strongly argued to the contrary that it was the necessity to cultivate the lands along the rivers as a result of population pressure that induced the introduction of those vegetables into the agricultural system. The encroachment on the land along the water courses has led to the drying up of many of the rivers.

4:7:2 APPLICATION OF FERTILIZER.

The use of manure and fertilizers, for a long time, has not been part of the Krobo agricultural culture. In the first place, animal rearing is not popular in the Manya Krobo District. The forest environment was, in the past, not conducive for cattle rearing. Poultry and piggery are also not important because of the over concentration on arable farming in the district. The few birds, goats and sheep that are kept as hobby are also not enough to provide adequate animal manure for cultivation. The use of compost and green manure is also virtually absent in the district. The alternative for sustaining soil fertility in the district is

the use of the fallow system. Under the fallow the land regains its natural fertility through bio-material decay. With the increasing shortening of the fallows, however, the need for artificial fertilizers has become paramount if the soils are to maintain a good level of production.

In the last decade, the farmers have been increasingly applying fertilizers to replenish the loss of soil fertility. Since 1988, fertilizer depots have been set up at Nuaso in Lower Krobo and Asesewa in Upper Krobo to cater for the increasing fertilizer needs of the farmers. The popular types of fertilizer used in the district are sulphur ammonium and 15-15-15. Tables 4:6 and 4:7 show the trend in fertilizer sales at the Nuaso Depot in Lower Krobo.

TABLE 4:6 FERTILIZER SALES AT THE NUASO DEPOT FOR 1988 (IN BAGS OF 25 KM WEIGHT)

MONTH	S/A	15-15-15	25-15-5
June	-	-	-
July	36	10	-
August	7	3	-
September	34	56	-
October	71	150	-
November	24	2	-
December	71	25	-
TOTAL	243	246	-

KEY: S/A = sulphur ammonium.

SOURCE: The District Agricultural Office (Crops), Odumase-Krobo.

TABLE 4:7 FERTILIZER SALES AT THE NUASO DEPOT FOR 1989 (IN BAGS OF 25 KM WEIGHT)

MONTH	S/A	15-15-15	15-15-5	20-20-20
January	50	30	-	-
February	-	-	-	-
March	106	300	-	600
April	56	17	-	-
May	40	22	-	-
June	300	10	-	-
July	35	233	-	-
August	-	114	-	-
September	-	3	-	-
October		(Sales suspended)		
November		(" ")		
December		(" ")		
TOTAL	547	726	-	600

KEY: **S/A = sulphur ammonium.**

SOURCE: The District Agricultural Office (Crops), Odumase-Krobo.

In Table 4:6, there was a total sale of 243 bags of Sulphur Amonium and a total sale of 246 bags of 15-15-15 from July to December, 1988. There was no sale of 25-15-5 in the period. In the first half of 1989 (Table 4:7), there was a substantial increase in number of bags of fertilizer sold at the Nuaso Depot. The total sales of sulphur ammonium was 547 bags showing a percentage increase of 125.1 over the 1988 sales.

A total of 726 bags of 15-15-15 was sold in 1989. This showed a percentage increase of 195.1 over the 1988 total sales of the type. In 1989 there was additional purchase of 600 bags of 20-20-20. On the whole, 1873 bags of fertilizer were sold in Lower Krobo. According to the District Agricultural Officer (Crops) at

Nuaso, there was additional supply of 243 bags of Urea Type of fertilizer to Global 2000 farmers in Lower Krobo in 1989.

The application of fertilizers is mainly for the cultivation of such crops as maize and vegetables. To enhance easy application of fertilizers and weeding, row-planting is now being introduced into the farming system. In sum, the farmers in the Manya Krobo District, conscious of the declining soil fertility and decreasing crop yields, are gradually turning away from their traditional method of sustaining soil fertility by the bush-fallow system to a more scientific method of fertilizer application.

It might be legitimate to view the increasing use of fertilizers in the Manya Krobo District in recent years as the result of the work of extension officers of the Ministry of Agriculture. Extension officers of the Ministry are stationed at the centres where there are fertilizer depots. Furthermore, there has been intensive education of the farmers on methods of improving yields; including application of fertilizers. The Krobo, however, generally operate their farms with little or no credit outside their own resources. Furthermore, they are, by tradition, not used to setting aside some capital for the improvement of the land they cultivate. They prefer using their earnings from the land for the purchase of new lands to the development of the old holding. That they now use part of their earnings for the purchase of fertilizers for the improvement of the soil is indicative of their awareness of the seriousness of the effects of population pressure and their preparedness to bring about a new equilibrium.

4:8 POPULATION INCREASE AND CHANGING CROP PATTERNS

An obvious way of increasing food output under population pressure is to grow higher yielding crops (Grigg, 1976). While the crop growing conditions were humid and the population of the district was small, the Krobo farmers were content with the growing of cocoa and oil palm as cash crops; and yams, cocoyam and plantain as food crops. Tomato and pepper were also grown but on a small scale. The increasing desiccating condition has not only eliminated cocoa and oil palm as the main crops in the agricultural system, but has also made the introduction of new food crops very necessary. The first important new food crop that was introduced into the farming system was cassava or manioc (Manihot esculent).

CASSAVA (MANIOC)

Cassava appeared in the farming system for the first time in the 1940's when a number of localities in Upper Krobo started experiencing long dry conditions which was the result of increasing environmental degradation. At first the crop was not popular and people who ate it were regarded as poor. With the declining yields of yams, cocoyam and plantain, however, the crop became increasingly popular. The advantages of cassava as a food crop are many. It is extremely tolerant of soil and moisture conditions and has high productivity per hectare even on light soils. It is also easy to propagate from stem cuttings and needs little tillage. Cassava has been described as hardy because it can be planted in soils already worn out by other crops. The crop takes 240 to 450 days to mature and can stay in the ground for periods up to three

years. It thus supplies fresh food all the year round and helps to solve food crop shortage problems. It is also a useful reserve against failure of other crops due to late or poor rains (Morgan & Pugh, 1978; Jones, 1957; Grigg, 1976). In addition, cassava can be made into a number of food forms, for example "kokonte" and gari. These preparations can be preserved for a long time.

The first cassava variety that appeared in the Krobo farming system was that locally called klaba. According to the farmers, it took about two years to mature. It was usually inter-cropped with yams and cocoyam on the "Hwehe". Later, with rapidly increasing population, decreasing fallows and dry conditions, the need for a cassava variety that could mature early was felt. Akla was then introduced in the middle of the 1950's. Akla took shorter time (about one and a half years) to mature. It was, however, bitter having hydroponic acid in the root. It thus had to be treated to remove the acid to make it less toxic. These two varieties could grow well under forest or thick bush ("ploke") fallows.

Further shortening of fallow periods made the introduction of new varieties that would mature quicker necessary. Oslam Nsia was thus introduced in the early 1960s. As its name implies, it could mature in six months "(Oslam" is month and "nsia" is six). Other quick maturing varieties that have been introduced in the 1980s to meet the rapidly increasing demand for food include the Zanaa and the "Abobei" which can mature within five to six months. Other new crops being introduced into the agricultural system are discussed below.

MAIZE

Another crop that was introduced almost concurrently with cassava was maize (Zea mays) which became popular in the farming system around 1940. Maize was introduced when desiccation led to the loss of many cocoa farms in Upper Krobo. It was to replace cocoa as a cash crop. Though it was not exported, it was in great demand for the internal market, especially for the urban population. It became the major crop in the Krobo basic economy (Alexander, 1954) for, like cocoa, which it replaced, it brought money for distribution within the district.

At first the environmental conditions were rather too humid for maize cultivation and the crop suffered severely from rust disease. This was between 1945 and 1960. It however continued to be cultivated because of its numerous advantages. It can grow under less humid conditions as it needs only 1016-1524mm (40 - 60 inches) annual rainfall and about seven months rainy season to grow (Morgan & Pugh, 1969 p.83). As the district generally meets these requirements, the crop became widely grown in the area. Naize can also be preserved for a long time when it is dry and can be used for a large variety of food. Furthermore it can easily be inter - cropped with yams, cassava and cocoyam.

At first maize was not considered as a staple crop in the Krobo community. The eating of its main food, kenkey, was a taboo to the people associated with the shrines, especially the Nadu deity, and many Krobo farmers regarded it as food for the urban dwellers, particularly the Ga. This was when there was still

enough yams and plantain for local consumption. With increasing population pressure, coupled with declining yam and plantain yields, however, maize gradually became the main staple crop in the district. Between 40 and 50 percent of the total production is consumed locally. Thus, population pressure has made a crop that was initially not popular as a staple crop to become very common in the diet of the people.

The first maize variety that was grown in the district was the tall maize locally called "Blefo-ngua". It appeared in the agricultural system around 1940. It grows tall and has large ears. Its yields per hectare is therefore quite high. It however matures in four months, (about 120 days) and thus does not mature early enough to "break the hunger" during the lean season. Of all the food crops, it is maize that matures first in the farming season. It is thus the crop that is harvested before other crops and considered to be a "hunger breaker". The long growing period also makes the variety susceptible to the rust disease (Morgan & Pugh, 1967). For these disadvantages, there was the need for a maize variety that could mature in a shorter time. A variety locally known as "Oloto" was introduced into the farming system around 1947 when the rust disease became widespread. This variety is short and matures in three months (about 90 days). It is also more drought resistant than the tall maize. These qualities make it more preferable, for it can mature before the rust disease could break out and it is a good "hunger breaker". Furthermore, it can be grown on marginal lands.

The introduction of the "Oloto" variety therefore made it possible for the drier high slopes to be brought under cultivation. "Oloto", nevertheless, has smaller grains and the yield per hectare is lower. In an attempt to get higher yield to meet the growing demand, many farmers now grow the two varieties in one growing season. While the tall type is cultivated on the more humid lands; the shorter variety is grown at the drier areas. This, however, needs greater labour input and involves larger expenditure. As at now, new maize varieties that have a combination of the assets of the two maize varieties are being introduced into the farming system to reduce production cost and yet get higher yields to meet the increasing demand. These include the "Tospido" and the "Global 2000" varieties. These varieties have large ears, small cobs and large grains. Their yields per hectare are therefore high though not as high as the tall maize. In addition they mature within two and a half months (between 70 and 80 days). They are thus able to "break the hunger" earlier and can be grown more readily on marginal lands under more dry environmental conditions. Because the growing season for these varieties is quite short, they, unlike the tall maize, can be grown readily in the minor season (from late September to early December) in addition to the major season. Their annual yields are therefore about twice that of the tall maize.

PEPPER (Piper guineense), GARDEN EGGS (Solanum melongena) AND TOMATO (Lycopersicon esculentum)

Though pepper, garden eggs and tomato were vegetables that existed in the agricultural system for a long time, they were

inter-cropped with other main crops on farms for domestic consumption only. This was when the environmental conditions were still humid and cocoa and oil palm were the major cash crops. They started to be cultivated on commercial basis when cocoa and oil palm declined in popularity in the district and the men took to the cultivation of maize as their cash crop. The women then cultivated the vegetables to subsidise the earnings of their husbands. The vegetables were grown mainly in the minor season which was formerly not utilized by the men who appeared to have much earning from the major season. The women and the children were then free to work on their vegetable farms.

In the late 1950s, however, the vegetables came to be widely grown by both men and women as cash crops. They were grown on the marginal lands at the higher slopes under dry farming* and at the banks of the rivers and the river beds where they do well without watering. These vegetables are quite drought resistant, especially pepper; and can therefore be grown towards the end of the dry season. They mature before the food crops and provide money for subsistence during the lean season. Now they are so popularly grown that they have transformed Sekesua into a vegetable market, the market field of which extends to areas like Koforidua, Accra, Tema, Ada and the Volta Region. Pepper can be preserved for a long time when it is dried and it is avoided by insect pests. The other vegetables are however very perishable.

*Dry farming in this context means the type of cultivation during the dry season in which the crops are watered usually with water from the river.

The increasing cultivation of these crops for cash has induced the intensification of the agricultural land use thereby bringing areas formerly not cultivated for various reasons under intensive cultivation. In the Sekesua area, in particular, the cultivation of these vegetables has, in recent times, become so widespread that they tend to supersede maize as the main cash crop in the area.

SWEET POTATO (Ipomoea batatas) AND SOYA BEANS (Glycine soja)

Sweet potato and soya beans are increasingly becoming popular in the agricultural system in the Manya Krobo District. Though their existence in the district predates the flooding of parts of the agricultural lands by the Volta Lake, they were essentially grown in backyard gardens and on small farms. They became popular crops first along the Krobo section of the Volta Lake where they were grown on the bed of the Lake when the water receded. They mature within a very short time (about two to two and half months) and were, at first, grown to utilize the fertile soils of the bed of the Lake during the dry season. The early appearance of the potato on the market is a welcome phenomenon, for, it also "breaks the hunger" during the lean season. Now the cultivation of the two crops has become widespread in the district. The potato has virtually replaced cocoyam in many localities and many tracts of land in the grassland area of Lower Krobo are now being devoted to bean cultivation.

It needs to be noted that the crops under discussion have been in the agricultural system in the district for a long time. They

however came under intensive cultivation when population pressure, land shortages and desiccating conditions made their increased production not only desirable, but more importantly, necessary because of their peculiar attributes. It is pertinent to recall Grigg's claim that an obvious way of increasing food output under population pressure is to grow higher yielding crops. The study has shown that in the Manya Krobo District the crops introduced or made popular under population pressure are not necessarily higher yielding but those that have other attributes like drought and disease resistance, shorter maturing period, and could be preserved for a long time. It has also been found out that the farming population, as well as the market population, had to change their taste and attitudes to certain crops under population pressure. Thus under population pressure, a people do not only intensify their land use to meet the increasing food demands; they equally change their tastes, values and attitudes towards certain crops that already existed in the system but were regarded as unpopular or less important. Then comes the old question whether population growth requires the cultivation of higher-yielding crops or whether the cultivation of higher-yielding crops allows larger families (Grigg, 1976 p.152). From the study it is argued that it is population pressure that induced the Krobo to introduce new crops into the farming system. Before 1940, when the population was small and land was abundant, the Krobo were traditionally attached to their popularly cultivated cocoa and oil palm as their cash crops; and yams, cocoyam and plantain as their food crops. It was

the rapid population growth since the 1940s and the shortage of land since the 1950s that induced the Krobo to adopt crops that they would traditionally not have regarded as staples and intensified their cultivation. Grigg supports this claim when he argues that the cultivation of the potato was enforced on the Irish by population growth (Grigg, 1976 p.152; Connell, 1950; Cullen, 1967, 1968).

It could be argued, also, that the introduction of the new crops into the agricultural system is the result of the market economy. Such an argument could be expanded to imply that the increased accessibility of the agricultural localities as a result of the opening up of the district, especially in Upper Krobo, exposed the agricultural system to the market population and the Krobo had to grow crops that could meet the demands of that population. While such an argument cannot be ruled out in its entirety, it should be noted that the Krobo themselves changed their eating habits. By tradition, the Krobo are resistant to change. Their history shows amply their resistance to other people's way of life (Azu, 1926). It is thus quite patent that the Krobo farmers would not have easily changed their eating habits if they had not come under great population pressure.

The higher slopes of the mountains and hills are also being cropped with alarming intensity. Such slopes are now devoted to the cultivation of drought resistant crops like pepper and beans. Increasing intensity of soil erosion is the result of the cultivation of the thin soils at these high slopes. Pits dug on

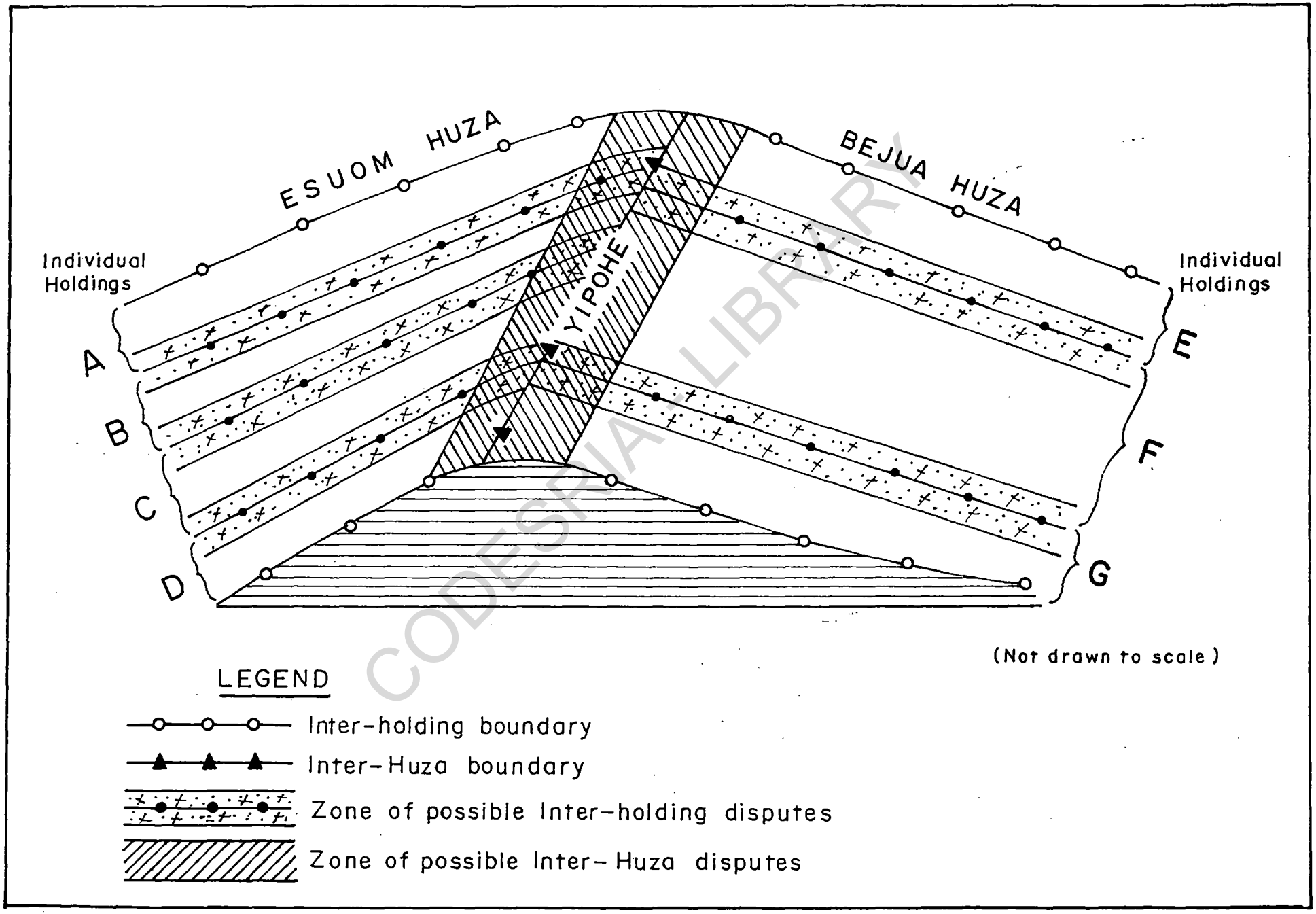
some of these slopes showed that the soil profile is less than ten centimeters deep. At other places, the bed-rocks are even exposed making it impossible for further cropping to be done.

4:9 INCREASING POPULATION AND DISPUTES OVER AGRICULTURAL LAND

Following the increasing land hunger in the Manya Krobo District, the farmers have become discretely particular about the ownership of agricultural land. This has led to rigid enforcement of some traditional arrangements for land ownership and the questioning of others. The result of all these is increasing cases of land disputes and land litigation. The main sources of these disputes and litigations are identified below.

1. **Boundary Disputes**
   (a) Disagreements over boundaries between two huzas; usually at the interfluence of the hills (YIPOHE HUZU).
   (b) Disagreements over boundaries between adjacent holdings on a huza (Fig. 4:5).
2. **Ownership Disputes**
   (a) Claims over sold or mortgaged holdings.
   (b) Rights of individuals, especially people with yobi status, slave origin or stranger ancestry, to own a tract of land.
   (c) Succession (inheritance) rights.
   (d) General trespass
   (e) Stealing of agricultural produce.

Fig.4·5 TWO HUZAS SHOWING ZONES OF POSSIBLE BOUNDARY DISPUTES



Investigations were made, at the two magistrate courts in the district, the traditional court at Odumase and the Committee for the Defence of the Revolution (CDR) arbitration centres to find out the volume of land use related cases that occured in the district from 1981 to 1989. Though the relevant records have been poorly kept in some cases, much information has been obtained. The details are shown in Table 4:8 and also Figures 4:5 and 4:6.

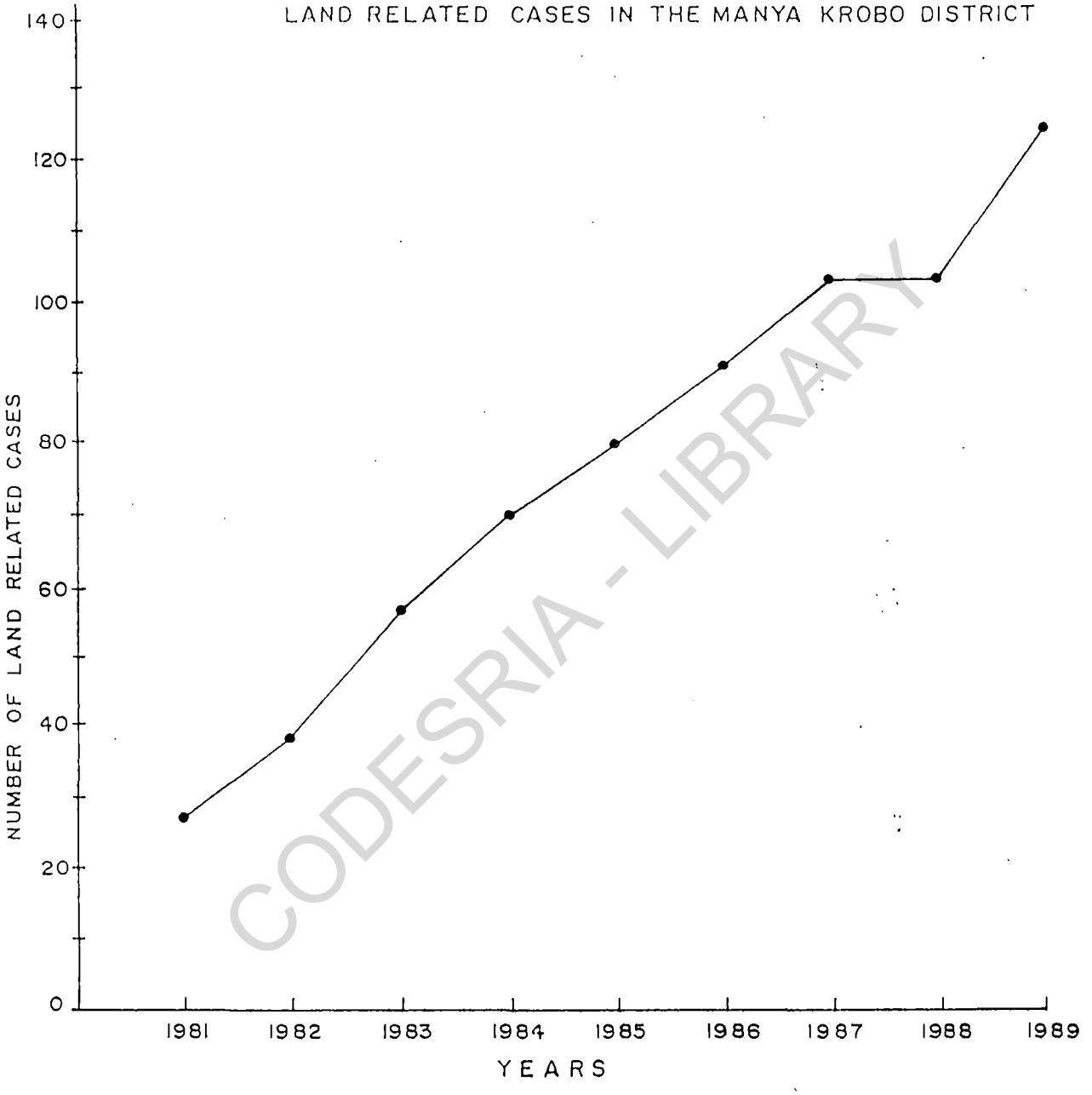
TABLE 4:8 LAND USE RELATED CASES IN THE MANYA KROBO DISTRICT (1981 - 1989)

TYPES OF LAND DISPUTES	1981	1982	1983	1984	1985	1986	1987	1988	1989	TOTAL
INTER-HUZA (YIPOHE)	2	2	5	7	5	11	13	6	5	56
INTER-HOLDING (KASAM HUZU)	3	3	5	6	9	13	13	21	23	96
INHERI-TANCE	3	6	6	7	8	11	12	12	20	85
RECLAIM OF SOLD LAND	6	8	11	12	14	12	19	19	21	122
GENERAL STEALING	8	12	17	21	29	30	30	30	35	212
TOTAL	27	38	56	70	80	93	108	108	125	705

SOURCES: Manya Krobo Traditional Court, Odumase.
District Magistrate Courts, Odumase and Asesewa.
District CDR arbitration centres at Odumase, Asesewa and Sekesua. Computations are by student.

Table 4:8 and Figures 4:5 and 4:6 show a general increase in land use related cases in the courts from a total of 27 in 1981 to a

Fig. 4·6 A LINE GRAPH SHOWING INCREASING TRENDS IN LAND RELATED CASES IN THE MANYA KROBO DISTRICT



Source; From Student's Fieldwork

total of 125 in 1989 (about 363 per cent increase). On the whole, there were 705 landuse related cases in the district from 1981 to 1989. For a greater understanding of the causes of the disputes and litigations the types of disputes are examined individually.

(a) Inter-Huza Boundary Disputes

Due to the nature of the group system of land acquisition, there are always areas where two huzas meet. These are usually at the interfluence of the catchments of the rivers or near rivers. Such inter-Huza boundaries are locally called Yipohe (Fig. 4:5). They are usually visibly marked with buna and stones (Yipohete). Usually, a curse of the gods is evoked against any future interference with the demarcation marks. In these days of severe land scarcity, individuals or groups of people from a Huza ignore the curses and try to shift the demarcation marks to their advantage. These trespasses generate inter-huza boundary disputes and litigations which, at times, result in the loss of lives. Such incidents were fewer in the past but they have been increasing in number quite substantially in recent years.

(b) Inter-Holding or Lateral Boundary Disputes

The boundaries between individual holdings are also areas of dispute. Formerly there was unity among the huza members who came together against other Huzas in disputes related to their Yipohe; and intra-huza land disputes were very rare. This was particularly so as everything pertaining to land ownership on a huza was almost codified and the information is handed down from generation to generation in the family of the original leader of the land

purchasing group (Zugbanyadalor) (Gyasi, 1975). Now, with increasing land shortages and declining sizes of land holdings, a number of the former land holding arrangements are disregarded. Lateral boundary marks are thus destroyed by cutting or burning to make it possible for an individual to shift the demarcation line to his advantage. Though some of the resultant disputes are settled locally, others end up in courts.

(c) Reclaims of Sold or Mortgaged lands

For some reasons, some farmers found it necessary to sell or mortgage their holdings in their life-time. As a result of the population pressure and its attendant land shortages, descendants of the vendees at times reclaim their lands for the return of the money paid.

(d) Inheritance Right Disputes

Disputes over rights to inherit tracts of land are not uncommon in the district nowadays. The situation was different in the past when as a result of rigidly laid down traditional arrangements, the order of inheritance was always pre-determined. It is often people of Yobi status in the family who are the main targets of such disputes. Reference is often made to their maternal origin in the inheritance system which is essentially patrilineal and attempts are made to disown them of lands they already occupy or traditionally have the right to inherit. Other victims of this type of dispute are people with slave or stranger origin. While there was much land for cultivation, these people were regarded as integral members of the families; but with the

scarcity of land becoming widespread, attempts are being made to find out who are the true Krobos. These disputes threaten the unity that previously existed in the Krobo families and in the Krobo state as a whole. It appears as if the shadow of Lolovo (where the larger Dangbe group disintegrated) hangs threateningly over the district now (Azu, 1926, pp.3-4).

(e) General Trespass

For want of agricultural lands, people now trespass into holdings that belong to other people. The reaction of the owners is usually violent; resulting in clashes and litigations.

(f) Stealing of Agricultural Produce

Stealing of agricultural produce has become a common occurrence in the agricultural system in the Manya Krobo District. The culprits are often not found, but where they are found, they are sent to court. Indeed agricultural produce theft cases are the largest group of cases in the courts in the district today. It is pertinent to note that it is the combined effects of population pressure, and land shortages in the district that have induced people to have gross disregard for the traditional virtues and norms of the past and motivate them to take to this social evil. It is not being argued that in the past there were no agricultural produce stealing cases. The point being made is that population pressure has led to increasing cases of agricultural produce theft.

While land was plentiful in the Manya Krobo District, agricultural land use disputes were predominantly between the Krobo as a whole on one hand and the Akan neighbours on the other. With

increasing population pressure, land shortages and landlessness, agricultural land use related disputes are found among the Krobo too. First it was essentially inter-Huza; then inter-neighbour; inter-family, among families and now even among people of the same parentage.

4:10 NON-DEMOGRAPHIC FACTORS IN THE AGRICULTURAL LAND USE CHANGE

It will be unrealistic to assume that all the variations in agricultural land use change in the district are explained by demographic variables. Certainly a number of non-demographic factors, singly or in combination with demographic variables, account for some of the changes in agricultural land use. The following section examines the relative role of such non-demographic factors for a balanced assessment.

4:10:1 TRANSPORTATION DEVELOPMENT AND AGRICULTURAL LAND USE CHANGE.

The role of transportation in any agricultural change cannot easily be overlooked. Transportation, basically, forms a link between the producing area and the consuming region. The level of the transportation network in an agricultural region is therefore a reflection of the volume of trade that takes place in that region. Generally the level of transportation in a region induces a parallel intensity of agricultural land use.

In the Manya Krobo District, in particular, the level of transportation development has visible effect on the agricultural land use. Road transport, which is the main mode of transportation

in the district, is used as an index to show the relationship between transportation in general and the intensity of agricultural land use in the district.

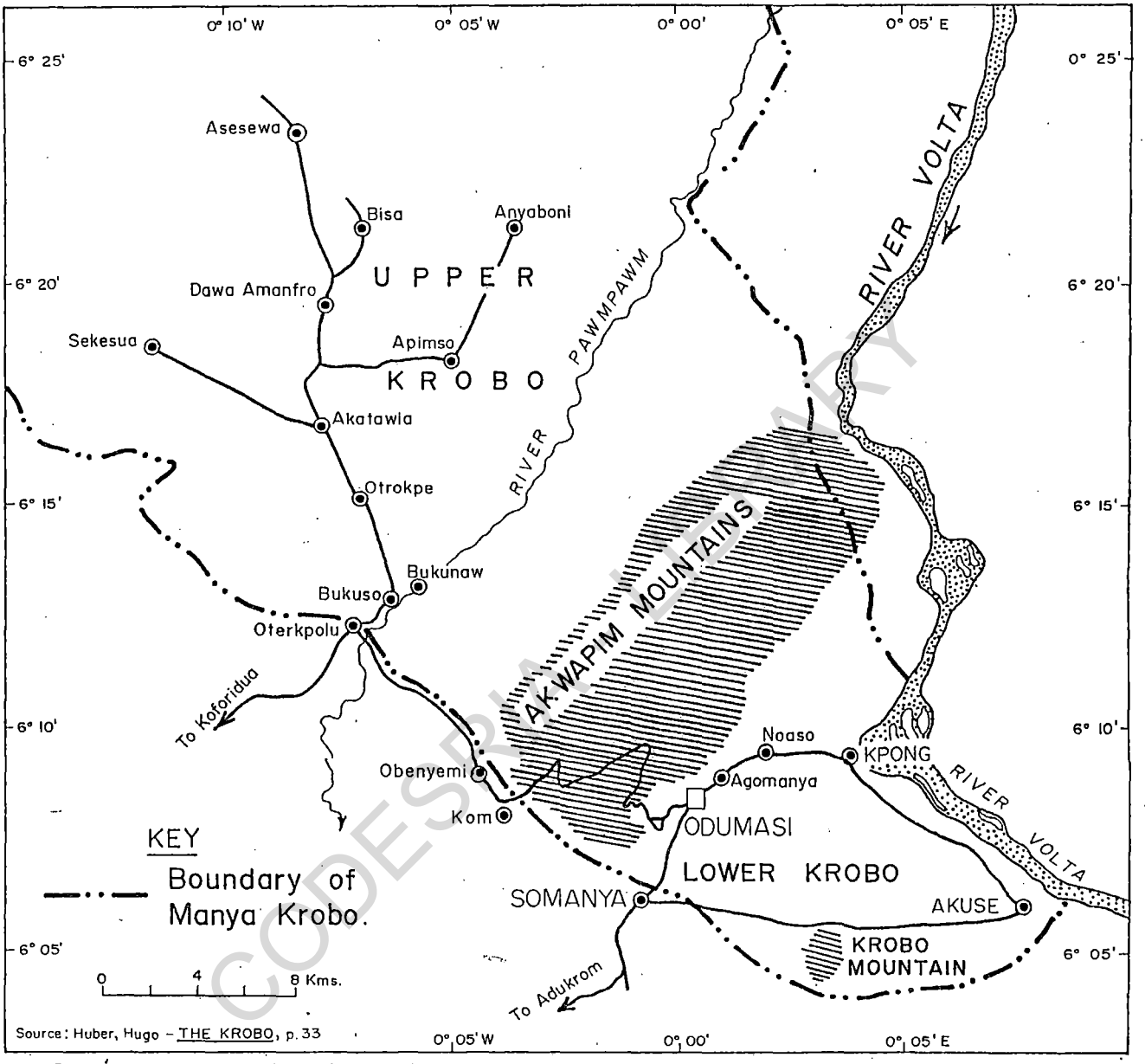
In the past, travelling on foot was a common practice in the district. Head porterage was therefore the dominant means by which agricultural produce was transported from the producing areas to the consuming ones. Before 1920 it was even necessary to roll barrels of palm oil over 5 to 30 kilometres on footpaths to Amedeka, a main inland port on the Volta River. The limitation of the amount of produce that could be transported at a time had great impact on the intensity of land use in the district. A respondent estimated that the heaviest load that an individual could transport by head porterage to a market was between 45 and 60 kilograms (100 - 132 lb). The consequence of this condition was that farm sizes were, on the whole, very small, usually between 5 and 6 hectares.

The booming cocoa industry in Upper Krobo in the 1920s made it desirable for a motorable road to be constructed from Koforidua to Bisa. This made it possible for large quantities of cocoa to be transported from Bisa, Apimsu and Otrokpe and provided incentives for the acquisition of more agricultural land in the Pawmpawm Basin. Nevertheless, the bulk of agricultural produce continued to be transported from the rural localities to the marketing centres by head porterage and the amount of agricultural produce that could be transported to the marketing centres remained essentially very small.

By 1927, as a result of increased agricultural production in the Pawmpawm Basin, another motorable road was constructed from Odumase to join the Koforidua - Bisa road at Oterkporlu. This road formed a major communication link between Lower Krobo and Upper Krobo and opened up the vast agricultural area in Upper Krobo to the large consuming market in south - eastern Ghana. Areas like Accra, Dangbeland, Akwamu and the Volta Region became commercially linked, not only to the active agricultural region in Upper Krobo but also to the Manya Krobo District as a whole. The resultant increase in the volume of trade in agricultural produce led to an intensification of agricultural land use in the Manya Krobo District, especially in Upper Krobo; for apart from supplying large quantities of agricultural produce to a large population outside the Manya Krobo area, it became possible to transport increased quantities of food crops from Upper Krobo to the agriculturally depressed localities in Lower Krobo. However, by 1950, the impact of road transport on agriculture production in the district remained restricted because, as noted earlier, the means of transporting agricultural produce from the rural farming villages to the marketing centres remained essentially head porterage (Fig. 4:7).

Road transportation began to make substantial impact on agricultural land use in the Manya Krobo District in the 1950s. The decade from 1950 to 1960 saw the construction of a complex network of trunk and feeder roads that made a large number of the rural farming localities accessible to the marketing centres by

Fig.4·7 ROAD NETWORK IN THE MANYA KROBO DISTRICT BEFORE 1950

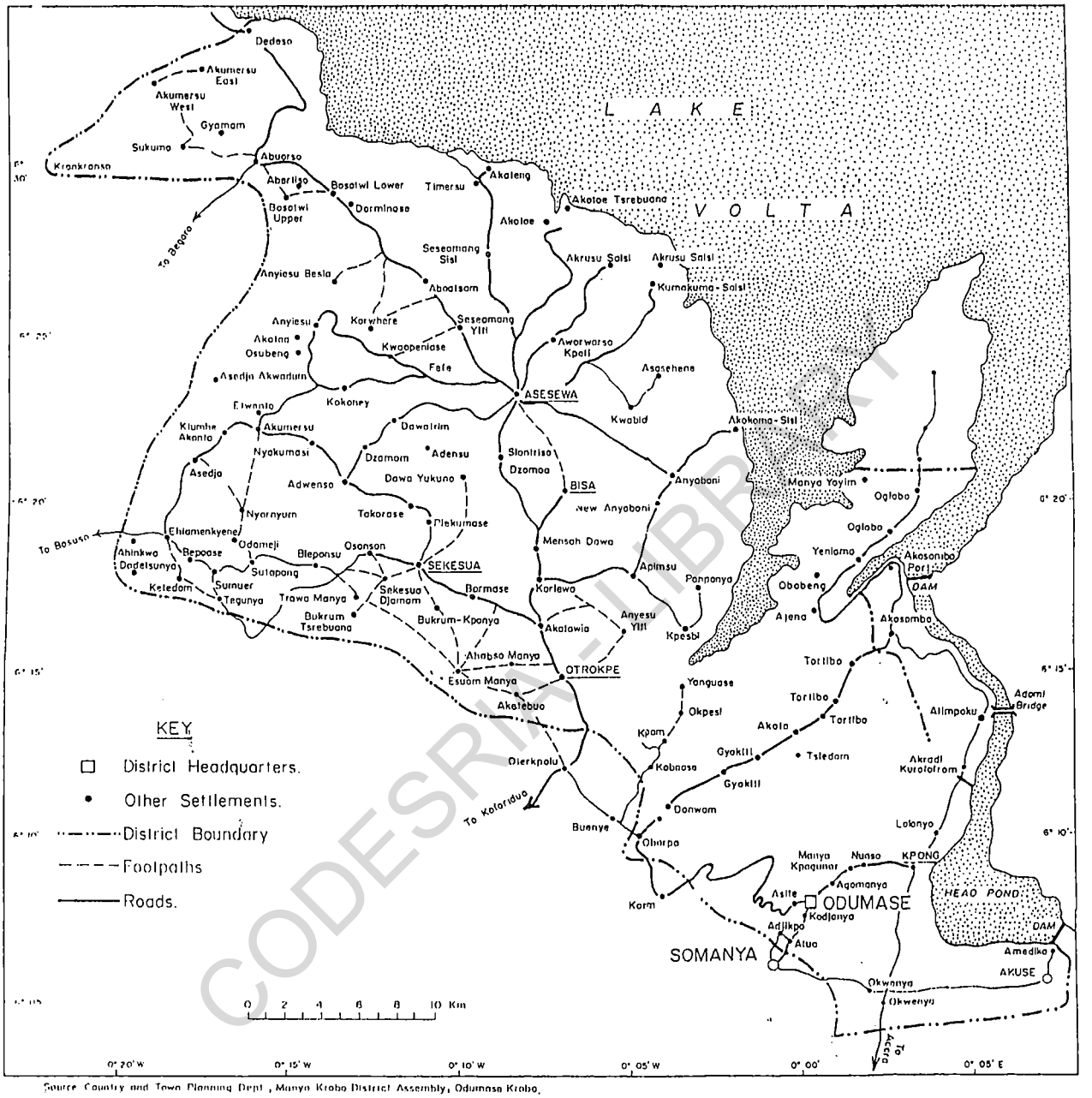


Source : Huber, 1963, p 33.

road. The first construction was the Asesewa - Akanteng - Omlegedu road in 1953. By 1960 the whole of Upper Krobo was opened up with trunk and feeder roads. Other roads are the Asesewa - Obuoso - Dedeso; Asesewa - Akotoe; Asesewa - Akrusu and Asesewa - Fefe - Adwenso. Similar roads like Sekesua - Akumersu - Ehiamekyene and Sekesua - Osonso - Ehiamekyene also converged on Sekesua. (Fig. 4:8). As at present, Asesewa and Sekesua have become great nodal market centres with most of the footpaths that formerly converged on them now turned into motorable roads. Other feeder roads were also constructed from a number of localities to join the main Odumase - Asesewa road. Three of these are particularly important in terms of regional linkage. These are the Oborpa - Akosombo (Dam site) road that links the active agricultural zone in the district directly to the Volta Region; the Asesewa - Obuoso road that links Upper Krobo directly to the Kwahu area; and the Sekesua Ehiamekyene road that links Upper Krobo to the western half of the country.

This massive opening up to the Manya Krobo District has created favourable conditions for the marketing of large quantities of agricultural produce. Individual farmers are now able to transport between four and six maxi bags (about 4 and 6 metric tonnes) of maize and cassava to the marketing centres on each market day. Vegetables are also transported in increasing quantities. It is now even possible for some traders to go to the agricultural localities to purchase agricultural produce at the doorsteps of the farmers.

Fig.4·8 TRANSPORTATION NETWORK IN MANYA KROBO DISTRICT AFTER 1950



Source Country and Town Planning Dept , Manya Krobo District Assembly, Odumase Krobo.

With the possibility of marketing large quantities of their agricultural produce, farmers in the district have intensified their agricultural land use. First, the unit measure of a farm (1 rope which is roughly about 5 hectares) has been enlarged to "Dawa Kofi" which is about 10 hectares. Next, many farmers have increased their farm size from one rope to about three ropes* (about 40 hectares).

4:10:2 INDUSTRIAL DEVELOPMENT AND AGRICULTURAL LAND USE CHANGE

Before the location of a textile factory at Akosombo in 1967 and a sugar factory at Asutsuare in 1964, many Krobos lived mostly in Upper Krobo which was the zone of active cultivation. The people came to Lower Krobo only occasionally to bury their dead, for festivals and to perform puberty rites (dipo) for their daughters. Lower Krobo was therefore virtually depopulated with the main residents being the old people (over 65 years old), children of school going age and students. Economically the place was a depressed area which lacked any appreciable mineral resources. Forest resources and agricultural production were only marginal. Furthermore manufacturing industry was limited to traditional craft and trade was insignificant (Bedele, 1979, p.32).

The location of these two factories near the district introduced some novelty into the farming system. The need for

*The word "rope", as used in this thesis, has two meanings. One is for the 12-25 yards strip of land that is the basic unit of what a farmer can own. The other is for the 5-10 hectare unit land that a farmer cultivates in a season. Thus, while the land owned by a farmer is measured in ropes (first meaning), the land cultivated by him is measured in ropes (second meaning).

sugarcane as raw material for the sugar industry at Asutuare gave motivation for sugarcane growing on semi plantation basis. Furthermore, the need for more food to feed the increasing population led to the introduction of rice cultivation under irrigation at Asutsuare. Though the sugarcane industry at Asutsuare is no more functioning, sugarcane growing has become a feature of the agricultural land use in the Manya Krobo District, especially at Okwenya and around Akuse. Similarly, though Asutsuare, where large scale rice cultivation started is outside the district, rice cultivation has spread to the grassland areas at Okwenya, Kpong and Akuse. Sugarcane and rice cultivation in the Manya Krobo District are usually associated with mechanisation and the application of fertilizers.

These facts, however, do not negate the earlier findings that population pressure has effected agricultural land use change in the Manya Krobo District. It has been clearly demonstrated that the population factor has been a powerful force that effects change in the agricultural land use in the district.

The findings in this Chapter give credence to the claim that population growth leads to agricultural change (Boserup, 1965). A large proportion of the agricultural change in the Manya Krobo District today, can be explained by population growth. The thesis of the investigation, however, is that the causal relationship between population and agricultural change is mutual. The next chapter focuses on the alternative proposition; that agricultural change influences population situations (Malthus, 1798).

CHAPTER FIVE

DEMOGRAPHIC RESPONSES TO THE AGRICULTURAL LAND USE CHANGE IN THE MANYA KROBO DISTRICT

5:1. INTRODUCTION

It has been established in Chapter 4 that population pressure has induced agricultural land use changes in the Manya Krobo District. The outstanding manifestations of these changes include:

(a) land fragmentation

(b) land shortages

(c) landlessness,

(d) decreasing fallow periods

(e) declining crop yield

(f) changing crop patterns; and

(g) increasing number of disputes over agricultural land.

The field investigation has revealed that the population in the district, is equally responding to the agricultural land use changes in the form of diverse demographic changes. Some of these agricultural land use induced demographic changes are:

(a) mobility within and outside the district,

(b) changing perception about fertility levels and the use of the family as a source of agricultural labour,

(c) increasing number of children who get formal education; and

(d) increasing occupational change.

These demographic responses to the agricultural land use change are the subject matter for discussion in this chapter.

5:2 AGRICULTURAL DECLINE AND POPULATION MOBILITY IN THE MANYA KROBO DISTRICT

The most obvious reaction of an agricultural community, aware that it is under population pressure, is to reduce its numbers (Grigg, 1976). This reduction in population numbers may be done naturally; through famine and epidemics (Malthus, 1798). In the Manya Krobo District, however, apart from the influenza of 1918 and 1919 which claimed a number of lives, there has not been any major epidemic. The district has also not experienced any severe famine apart from the one of 1983-84 which was nationwide.

Another way by which a community under population pressure could reduce its numbers is through birth control. This line of action is also not found to be desirable in the Krobo traditional community where there is preference for large families which are a source of agricultural labour and prestige (Bedele, 1986). The desire of parents for early marriage (for their children) to boost agricultural production, equally rules out any advantage which delayed marriage could have on the reduction of population numbers in the district.

The obvious alternative left to the Krobo to reduce their population numbers is therefore through migration. The Krobo are said to be quite migratory (Pogucki, 1952). Before 1950, this migratory tendency of the Krobo was essentially related to the shifting nature of their agricultural system. By 1948 about 23 per cent of the total population in the Birim District was found to be Krobos who had moved away from their traditional area to settle on individually acquired and settled lands; and only 69 percent of

their total was counted in the Volta River District to which they belonged at the time (Ghana Population Census Office). By 1960 the volume of migration among the Krobo had increased to 50 percent of the total population (Ghana Population Census, Office).

Four main types of population mobility could be identified in the Manya Krobo District. These are:

i. movements within the district,

ii. migration from the district to other agricultural regions in the country,

iii. migration to the cities in search of employment, and lastly,

iv. migration to other countries for employment and education.

In more specific demographic language, there are internal migration; rural-rural migration, rural-urban migration, urban-urban migration, and external or international migration.

A distinction is often made between temporary and permanent migrations (Grigg, 1979). The study has shown that about 50 percent of the migration wave in the Manya Krobo District is essentially of temporary type. As stated in Chapter Three, people leave their usual places of residence in the farming seasons to new or other farming areas for cultivation. In the main, these are seasonal agricultural migrants. About 15 to 20 per cent of the migrants are in this group.

Other people migrate not to the rural areas but to the towns where they reside for most part of the year. They however come to

Lower Krobo to bury their dead or perform the dipo puberty rite for their daughters. About 30 to 40 per cent of the migrants are in this group. A few of the migrants, about 5 percent, however have moved out of the district permanently. Looked at from another angle, migration from the district can be classified into migration to places outside and that within the district. In the next section attention will be on this second category of migration.

5:2:1. POPULATION MOBILITY WITHIN THE DISTRICT

In terms of migration within the Manya Krobo District, the area can be divided into a source region and a destination area. The source region includes the Afram Plains, the Aklum Basin and the Pawmpawm Basin. The main destination area is Agodza, with Lower Krobo being both a source region and a destination area. An attempt was made in the field to find out why people migrate from the rest of Upper Krobo to Agodza and Lower Krobo. The hypothesis for testing is that it is essentially the shortage of land in the district that made people move out of the formerly active zone of cultivation in Upper Krobo to Agodza and Lower Krobo. In the investigation, 326 of the 500 respondents were found to be in the Afram Plains, Aklum Basin and the Pawmpawm Basin. The total number of dependants of the respondents who had moved out of these areas to Agodza and Lower Krobo, was found to be 283. These 283 people were the target of investigation. They were followed to their destination areas and interviewed. They were mainly people who travelled from the source region between 1950 and 1990. The

reasons given for their movement out of the source region are tabulated in Table 5:1.

TABLE 5:1 REASONS FOR MIGRATION OUT OF UPPER KROBO TO AGODZA AND LOWER KROBO (1950-1988)

REASONS	No.	PERCENTAGE
1. Shortage of farming land in Upper Krobo	131	46.3
2. To work in industries	72	25.4
3. To engage in commerce	45	15.9
4. To learn a trade	16	5.7
5. No response	19	6.7
TOTAL	283	100.0

Source: Compiled from student's investigation.

In Table 5:1, 131 out of the 283 migrants (46.3 percent) moved out of the source regions of the Afram Plains, the Aklum Basin, and the Pawmpawm Basin to the destination areas of Agodza and Lower Krobo mainly because of land shortages in the source regions. These were found to be essentially people who held maternal right to the land they occupied in the source regions. Others held paternal rights but were given only marginal allocations because they were people other than first males in their families (Chapter Two). The stress of population on the land has eroded the once cordial relationship that existed between those who inherited paternally (NYUMUBIME) and those who inherited maternally (YOBIME) and many of the latter have been forced to move to their ancestral holdings at Agodza in accordance with the Krobo tradition (Chapter

reached 5853 (57.1 per cent increase from 1970) and the number of houses increased to 814 (50.7 per cent). The number of people born outside the Agodza area but in the same Eastern Region in 1984 was 3163 (106.6 percent increase) and the number of people employed in agriculture was 4178 (131.2 per cent increase). On the whole, the population at Agodza increased by 3820 (189.6 per cent) between 1960 and 1984; and the number of houses increased by 514 (169.5 per cent) during the period. During the same period, the people born outside the area increased by 2441 (380 per cent) and the number of people employed in agriculture increased by 3592 (857.9 per cent). From the above analysis, it is argued that the in-migrants at Agodza, being mainly from the Eastern Region and essentially farmers were predominantly people from the rest of Upper Krobo, specifically, the Afram Plains, the Aklum Basin and the Pawmpawm Basin. It was this population that re-settled in Agodza in the 1960s and cultivated the 50 years fallow (Chapter Four).

Seventy-two (72) of the 283 out-migrants from Upper Krobo (25.4 percent) went to Lower Krobo to work in such industries as Akosombo Textiles Limited, Asutsuare Sugar Factory and Juapong Textiles (Chapter Four). Asked if they would have left their source region in Upper Krobo if there were no industries in Lower Krobo, a large proportion of the migrants answered that the prevailing landlessness and declining yields in Upper Krobo provided enough "push force" for their out-migration and the industries only directed their migration track.

A few people, about 21 per cent, also moved to Lower Krobo from the Upper Krobo source region for commerce or to learn some trade. These people also claimed that it was the deteriorating agricultural conditions that pushed them out of Upper Krobo. Generally therefore, the finding confirms the hypothesis that it was essentially the declining agricultural condition in the former active zone of cultivation in Upper Krobo that pushed people out of the place between 1950 and 1988.

The other related migration within the district has been discussed under LAND ACQUISITION AND POPULATION EXPANSION in Chapter Three. There, it was noted that the population followed the land acquisition process from the Krobo Mountain to the Afram Plains. Thus it was the agricultural land use that guided the initial distribution of the population over the district. It was also noted that it was the stage of agricultural land use in a locality that determined the sex and age composition of the population. The proportion of the youth was usually higher in the new holdings (Hwehe) while the proportion of people in the age groups 1 - 15 and 64 plus was higher in the old holdings (Ngmonya). Males also predominated in the population of the new holdings while females usually out-numbered the male in the old holdings.

5:2:2 AGRICULTURAL DECLINE AND OUT-MIGRATION

Some of the people who were pushed out of the Manya Krobo District as a result of the deteriorating conditions went to other areas to seek their living. A total of 4615 dependants of the 500

respondents were reported to be outside the district at the time of the field investigation. Of the number, 2558 (56 percent) were male and 2027 (44 per cent) were female. Of these migrants, 2769 (about 60 per cent) were between the ages of 18 years and 50 years. Details of the destination areas of these migrants are shown in Table 5:3.

TABLE 5:3 DETAILS OF MIGRATIONS FROM THE MANYA KROBO DISTRICT 1950-1989

DESTINATIONS	TOTAL		MALE		FEMALE	
	No.	%	No.	%	No.	%
OTHER AGRIC REGIONS IN GHANA.	2919	63.3	1871	72.3	1048	51.7
CITIES IN GHANA	1011	21.9	422	16.3	585	18.7
WEST AFRICAN COUNTRIES	672	14.6	287	11.1	385	18.9
OTHER COUNTRIES	13	0.3	8	0.3	5	0.3
TOTALS	4615	100.0	2588	100.0	2027	100.0

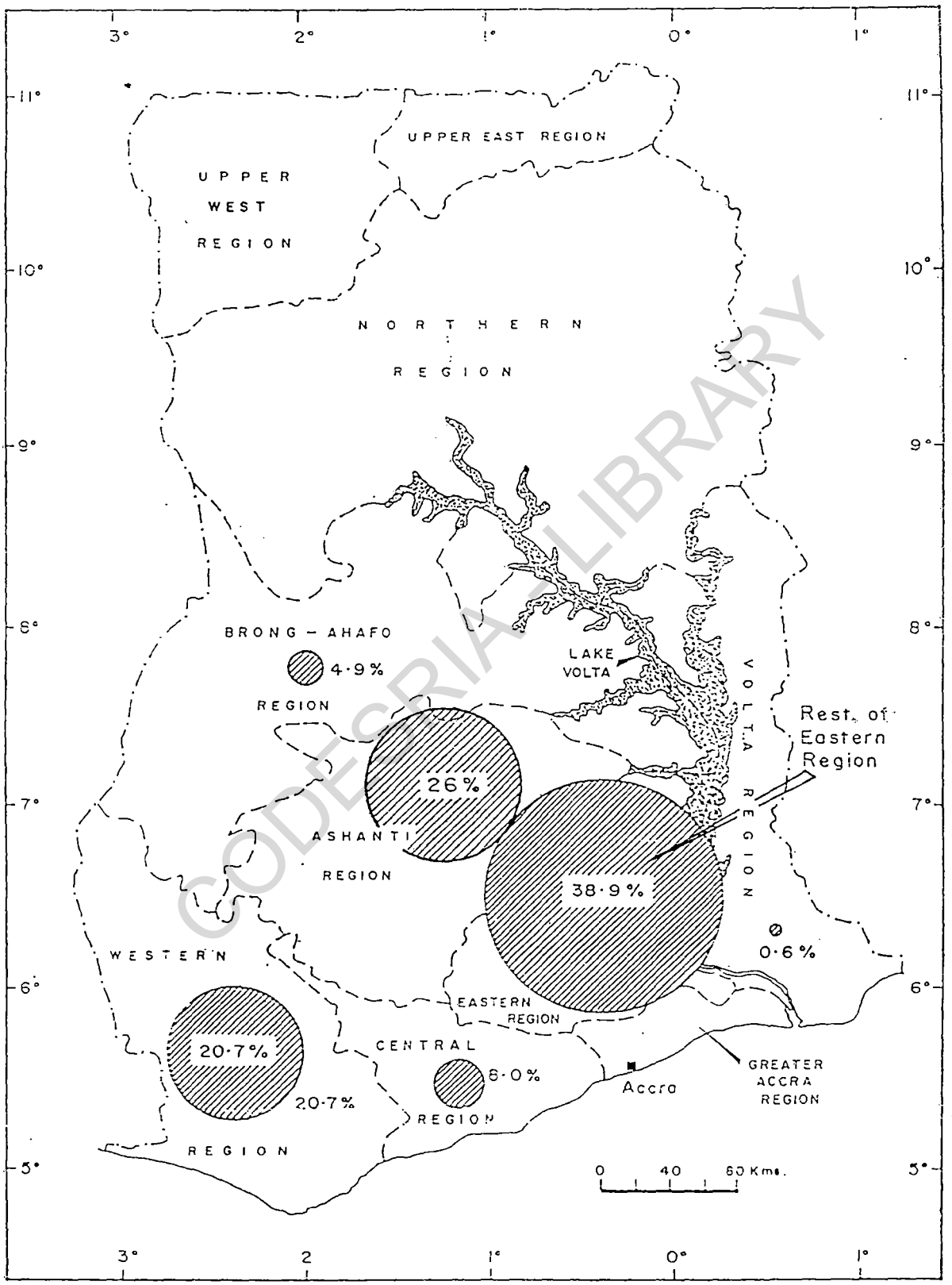
SOURCE: Compiled from student's field note.

Table 5:3 shows that of the total 4615 migrants who moved out of the Manya Krobo District, 2919 (63.3 per cent) went to other agricultural regions of the country. Of this number, 1871 were male and 1048 were female. Thus 72.3 percent of the total number of males and 57.7 percent of the total number of females who moved out of the district went to other agricultural regions of the country. Specifically, 1135 (38.9 per cent) went to other parts of the Eastern Region; 232 (8 percent) went to the Central Region; 603

(20.7 percent) went to the Western Region; 142 (4.9 percent) went to the Brong Ahafo Region and 16 (0.6 percent) to the Volta Region (Fig. 5:1). The distribution of the destination areas shows that these agricultural migrants were essentially pulled to areas of humid forest. A visit to the Enchi, Goaso and Kwahu destination areas showed that where land was plentiful, the Krobo reverted to their combined shifting and bush fallow system of cultivation. This is a further proof that it was mainly population pressure that compelled them to abandon the shifting aspect of their cultivation in the Manya Krobo District. It was also found out that the Krobo system of cultivation has a greater potential for forest destruction than the activities of the timber contractors. The basis for this assessment is that while the timber contractor cuts only stands in the forest, the Krobo farmer clears the whole forest on a tract of land he intends cropping.

A thousand and eleven (1011) of the 4615 migrants (21.9 per cent) moved out of the Manya Krobo District to towns and cities like Koforidua, Accra, Tema, Takoradi, Kumasi and Tamale. Of these rural-urban migrants, 422 (16.3 per cent) were male and 589 (29.1 per cent) were female. Fifty-eight (5.7 percent) of the 1011 rural-urban migrants had gone to the towns for educational reasons and 239 (23.6 per cent) were literates who had gone to the towns for employment. While some of these people were attracted by the "bright light" of the towns, a majority of them were people who were pushed out of their agricultural communities in the Manya

Fig.5·1 DESTINATIONS OF MIGRANTS FROM THE MANYA KROBO DISTRICT TO OTHER FOREST REGIONS



Source: From Student's Fieldwork

Krobo District by the prevailing deteriorating agricultural conditions induced by population pressure.

The female predominance among the rural-urban migrants could partly be explained in terms of the traditional land inheritance laws of the Krobo. By this tradition, women do no inherit land property (Huber, 1963). In the past, when there was abundant land in the district, alternative arrangements were in force for the care of these women by their brothers who inherit their ancestral land. These arrangements have, however, been disrupted by the land shortage situation and many women are now without any sustainable support. To these people, a drift to the towns has become an obvious means for economic support. Evidence from the field showed that massive female exodus from the district started in the 1960s when the effects of land shortages in the district became marked. Possibly, the presence of a large number of Krobo prostitutes in and outside the country is the outcome of the Krobo traditional provision that deprives women of agricultural land.

Movement of people from the district to other West African countries became clearly noticeable in the 1970s. Six hundred and seventy-two (672) people out of the 4615 migrants who left the district went to such destination areas. Two hundred and eighty-seven (11.1 per cent) of the total number of these migrants were male and 385 (18.9 percent) were female. First, Cote d'Ivoire had the greatest pull on the migrants. There were chain migrations, particularly among the female, to Abidjan and the surrounding towns. These were women between the ages of 16 to 30 years. Later

the migrants went to Nigeria, Burkina Faso, Liberia and Togo. The present volume of migration of Krobos to the other West African countries might, however, not be wholely blamed on population pressure in the Manya Krobo District. For the past two decades, harsh economic conditions in Ghana, as a whole, provided a strong push force for the youth to move out of the country; and the youth of the district were not left out.

Thirteen (13) (0.3 percent) of the 4615 people who migrated outside the Manya Krobo District went to countries outside the West African sub-region. Eight (8) of these people were male and 5 were female. The main destinations of this category of migrants were the then West Germany, France, Italy and Britain. Only 3 of these people went out for educational reasons. Ten (10) went to these destinations to look for employment. They were mainly Middle School leavers who consider agriculture as derogatory to their status. These people could thus not be regarded as people who were pushed out of their agricultural localities by the deteriorating agricultural conditions.

In summary, increasing population in the Manya Krobo District has created stress on the land. The people are responding to this population stress by introducing novelties into the agricultural system. On the other hand, the pressure of people has led to increasing rate of vices, particularly stealing of agricultural produce and land disputes in the district. An increasing number of people, nevertheless, are pushed out of the agricultural communities as a result of the declining agricultural conditions.

5:3 AGRICULTURAL DECLINE AND CHANGING PERCEPTION ABOUT FERTILITY LEVELS AND THE USE OF THE FAMILY AS A SOURCE OF LABOUR

It has been noted in Chapter Two that fertility is generally high among the Krobo. In the Krobo agricultural communities, large families are preferable; for they are not only considered as prestigious but they also provide large agricultural labour. Children are also perceived as security against old age (Bedele, 1986). Large families were, however, preferable in the past when agricultural land was abundant and new holdings could be acquired with ease.

With increasing agricultural land shortages and landlessness prevailing in the district, it has become increasingly necessary to change the traditional preference for large families. Though average fertility levels are still high (about 5 - 6 children per woman), an increasing number of people now hold the view that smaller families are desirable.

In an interview randomly conducted among the people, 163 out of 200 respondents (81.5 percent) expressed preference for lower fertility levels of about 2 - 4 children per woman. Of the 163 respondents who showed preference for smaller number of children, 138 (about 80.1 percent) were in the age group of 18-40 years. Thus a large proportion of the youth in the district are abandoning the traditional preference for large families. A large number of the youth (about 68 percent) gave the prevailing land shortages in the district and the difficulties involved in acquiring new agricultural land outside the district as the primary reasons for their changing perception.

5:4. AGRICULTURAL DECLINE AND RISING EDUCATIONAL LEVELS

The analysis in Chapter Two showed that increasing number of people are getting formal education in the Manya Krobo District. In the past when there were large tracts of agricultural land, crop yields were high and returns from agriculture were good, agriculture was the main occupation of many Krobo families. At that time, the children were expected to help their parents in their agricultural activities; thus, formal education was perceived as a preserve for non-agricultural communities. As a result of this notion, many children of school-going age were denied the right to education. It was often only the few families that had close association with missionary work which gave their children formal education.

A comparative study was made in the field to find out how much a family spent on education in the 1940s and in 1988. The details are tabulated in Table 5:4 for discussion.

TABLE 5:4 ANNUAL EXPENDITURE OF A KROBO AGRICULTURAL FAMILY - 1940s AND 1988

EXPENDITURE ITEMS	1940s		1988	
	COST (IN £)	% OF TOTAL EXPENDITURE	COST (IN ¢ '000)	% OF TOTAL EXPENDITURE
New agricultural lands	10	25	NIL	NIL
Funerals	6	15	50	19.2
Clothing	14	35	65	25
House Keeping	4	10	40	15
Dipo, marriage & festivals	6	15	20	8.7
Education	NIL	NIL	85	32.7
TOTAL	40	100	260	100

SOURCE: From field investigation.

In Table 5:4, 25 per cent of the annual family expenditure was on acquisition of agricultural land in the 1940s. On the other hand, there was no expenditure on education. At the time, there were four children of school-going age in the family and yet none of them was in school. Acquisition of agricultural land was valued more than education; for, at the time, the father was pre-occupied with acquiring agricultural land which the children would inherit on his death.

The perception about the value of land as compared to the value of education changed by 1988 (Table 5:4). In that year the family spent as much as about one third (32.7 percent) of its annual expenditure on education and nothing on the acquisition of

agricultural land. It was explained that giving the children formal education could make them less dependent on agriculture in the future.

The increasing importance of education in the district should normally induce agricultural growth in the area. The people who have benefited from formal education could have greater access to agricultural information and knowledge which could be used to improve agricultural practice. The finding from the field investigation, however, was to the contrary. The educated people frowned on agriculture which they considered as an occupation for the illiterate members of the family. These educated people usually join the migration stream to the cities in search of "white collar" jobs.

On the whole, there appeared to be some negative correlation between agricultural prosperity, and the level of education in the district. While agricultural land was abundant and agriculture was flourishing, less attention was given to education. With declining trends in agriculture nowadays, an increasing number of people are being given formal education.

5:5. AGRICULTURAL DECLINE AND OCCUPATIONAL CHANGE

The characteristic agricultural nature of the people in the Manya Krobo District, as described in Chapter Two, is gradually changing. Mention has already been made (Chapter Three) of people, who, as a result of the declining trends in agriculture, have moved to Lower Krobo and outside the district to engage in occupations

other than agriculture. In the district itself, marked occupational change is also observable.

In the past, when agriculture was booming, vocational trades were not very important in the district. It was usually the youth who were considered to be too lazy for agricultural activities and those who had some physical defects that were asked to learn some vocational trade.

Nowadays, a greater number of the youth are in vocational trades. The popular vocations today are carpentry, masonry, driving, auto and shoe repairs for the male; sewing and hairdressing for the female. A survey was conducted in Lower Manya Krobo, Asesewa and Sekesua to find out the number of people engaged in these vocations. The details are shown in Table 5:6.

TABLE 5:5 NUMBER OF PEOPLE ENGAGED IN THE VARIOUS VOCATIONS IN LOWER MANYA KROBO AND AT SEKESUA (1989)

VOCATION	QUALIFIED	APPRENTICES
Carpentry	32	46
Masonry	27	41
Driving	61	102
Auto-Repairs	39	63
Shoe Repairs	17	11
Sewing	43	133
Hairdressing	54	103
TOTAL	273	409

SOURCE: From field observation.

On the whole, 273 people qualified in the various vocations and were operating their own establishments. There were also 409 apprentices in the vocations. Thus there was a total of 682 males and females who were engaged in vocations and were therefore partially or completely withdrawn from agriculture.

The increasing importance of the vocations in Manya Krobo could generally be attributed to the declining trends in agriculture in the district. Land shortages have made accessibility to agricultural land age-selective. As many families now live on ancestral land, it is essentially the older people in the families who have access to agricultural land. The displaced youth must find their livelihood outside agriculture and an increasing number of them are turning to vocational trades.

This finding is however not wholely supported by the people in the district. A few people argued that it is the rising level of education in the district that makes the vocations popular. They claim that as a result of the notion that agriculture is not an occupation for the educated, parents are embarrassed to send their wards who dropped out of school to the land and these drop-outs find the vocations to be better options. Others also claimed that the increasing importance of the vocations in the district is a general response to the national call for every youth to try to get into a vocation. Whatever the merits of these arguments, the proposition that the declining trend in agriculture plays a significant role in the occupational change in the district can hardly be ignored.

In this Chapter, it has been demonstrated that population does not always remain an independent variable determining agricultural change. The population in the Manya Krobo District responds to the agricultural changes that are taking place in the area. As a result of the agricultural decline, the farmers migrate within the district in search of better farming land or to engage in other sectors of the economy. Other farmers migrate outside the district to look for new agricultural lands, especially in the forest regions.

A few of the people also migrate out or emigrate from the district in search of employment in economic sectors other than agriculture. In addition to migration, the deteriorating agricultural conditions in the district are changing the traditional perceptions of the people in the agricultural communities. These changing perceptions are predominantly felt in the areas of fertility levels and education.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 SUMMARY

The relationship between population and agricultural land use has been the subject matter for debate since the days of Robert Malthus. The debate is considered inconclusive and this study is basically to make a contribution to the discussions.

The Manya Krobo District has been the study area. In this district, the people are renowned farmers who have been engaged in agriculture since 1731 and their population has been growing rapidly in recent times. It is the existence of such ideal conditions in the district that justifies its choice for the empirical investigation on population and agricultural land use. A summary of the findings is made in this section as a prelude to the conclusion.

The main findings of the study, are summarised as follows:

(1) Mutual causal relationship between population and agricultural landuse

The causal relationship between population and agricultural land use in the Manya Krobo District is mutual. Population increase in the Manya Krobo District provided an ever-present crave for land acquisition and territorial expansion by the Krobo. Similarly population growth made it necessary for the Krobo to change from "millet" cultivation to more food-yielding crops such

as yams, plantain, cassava and cocoyam. Later in the history of the people, population pressure induced environmental degradation that necessitated change from crops grown under humid conditions to the cultivation of more drought-resistant crops. Additionally, there has been, partly as a result of population pressure and increasing desiccating conditions, a change from the cultivation of cocoa and oil palm as the main source of income to less humid adapted crops such as maize, potatoes, cassava and beans for internal distribution. These changes, together with declining yields of formerly popular crops are inducing changes in the staple crops and diets of the people. For example while in the past, yams, plantain, and cocoyam were notable favourite staple crops of the Krobo, at present the people have to subsist on such crops as maize, cassava, and potatoes.

Population stress has also induced marked changes in the landholdings system. The large holdings that characterized the farming system in the district in the past have now given way to fragmented small holdings. Another result of population pressure is the increasing use of the marginal lands, often at great cost, and greater intensification in terms of labour. Now the higher slopes with thin soils and the banks of the rivers, formerly marginalised in the agricultural system, are being progressively brought under cultivation. This has caused extensive vegetation clearing and further environmental deterioration with deforestation and soil erosion being the chief degradational processes. Lastly

the declining yields in the district at present are found to be partly the result of over cultivation induced by population stress.

(2) Introduction of new crops under population pressure

Under population pressure, the Krobo introduced new crops into the agricultural system and changed their eating habits. Though some of the new crops existed in the system in the past, they were not popularized until the people came under population pressure. This finding supports the claim by Prothero (1933) that under population pressure, crop changes occur not only in the crops themselves; but also in the purpose for which they are grown.

(3) Population pressure and increasing land disputes

A factor that cannot escape mention is the increasing number of land disputes in the district. These disputes have been found to be the social hazards of the population stress. The disputes and litigations over agricultural land have serious implications for the agricultural system in the district. They disorganize the agricultural system on which the Huza system of farming rests. The seriousness of the situation is that with increasing land shortages, the disputes are now not limited to conflicts between the Krobos and their Akan neighbours. They have escalated into inter-Huza and even inter-holding disputes. With members of the same family engaged in disputes and litigations over ancestral agricultural land, the unity of the basic unit of the society is in jeopardy and the Krobo society as a whole, is under threat. If the

trend is not reversed, there will be an eventual disintegration of the Krobo system of agriculture and the social structure.

(4) Agricultural change and population re-distribution

Viewed as the independent variable, agricultural land use has equally induced population change in the Manya Krobo District. Agricultural intensification in the form of territorial expansion also led to the distribution, regrouping, relocation and expansion of the population from the Krobo Mountain to the Afram Plains. Closely related to this factor is the evolution of the peculiar Huza system of settlement. Under this system, the Krobo settled on the individual holdings and organized their farms individually. No doubt, the Huza systems of farming and settlement are seen as twin developments of the Krobo population and its system of providing livelihood. Consequently, the word "Huza" is often used for the Krobo system of settlement as well as their system of farming.

(5) Agricultural decline and population mobility

Population mobility, is another manifestation of the agricultural land use change in the Manya Krobo District. Owing to increasing land shortages and landlessness now prevalent in the district, the population is moving, not only to places that were formerly abandoned, but also outside the district to seek new forest lands for cultivation. This migration has significance for the composition of the population in the various localities. The population is progressively becoming dependent as the youth move

out to the other forest regions where they start new farms. Though this reduces pressure on the land, it is seriously depriving the area of its labour force.

(6) Agricultural decline and fertility levels

In terms of fertility levels, the study has shown that, in the past, the need for farm labour made it desirable for the Krobo to have large families, a desire that encouraged high fertility levels and polygamous marriage. Under the prevailing declining agriculture, this perception is changing. People now see large families as a socio-economic burden and are becoming more receptive to the family planning programme.

(7) Agricultural decline and occupational change

For lack of agricultural land, and for the general agricultural decline, many Krobo farmers, especially the youth, are now turning to occupations other than farming. However, a large number of these people still engage in agriculture during the main farming season to supplement their earnings from the other occupations.

The above results from the field investigations corroborate the findings from similar investigations by other researchers. Though such findings have already been stated in the literature review, the pertinent ones are reintegrated here to articulate the stated findings.

The findings agree with the claim by Clarke (1968) that rapid population growth is the principal motivation which brings about extensive clearing for cultivation and the introduction of improved crops and manure at certain periods in history. They equally support the statement credited to Gleave and White (1969) that increasing population density eventually reduces the length of the fallow period; and the claim by Allan (1969) to the effect that with the reduction of the fallow period, fertility declines and yields fall making it necessary for more land to be cultivated.

The findings further support Allan's statement that population pressure is a powerful force that gives rise to agrarian decay. Though, there is no absolute agrarian decay in the Manya Krobo District, the process of decay is evident. The findings equally give credence to the assumption of Hodder (1980) that migration out of a place under population stress might increase distress in the area because of its effects on the age and sex structure, for migration usually involves the younger and active male section of a population. It is however very doubtful whether the assertion by Hodder that migration out of the over-populated area is to relieve population pressure on the land would be manifested in the Manya Krobo District. While there was new agricultural land for acquisition, it was possible to relieve pressure on the old holdings by movement to the new ones. Under the present condition, agricultural colonization is very difficult and the people involved in out-migration are too few to make any meaningful impact on the resident population.

The findings are also in agreement with Simkins (1970) who made a study in the Philippines and concluded that response to population pressure in the area was by increasing colonization of empty areas. Certainly, it is the non-availability in the district of such lands waiting to be colonized that has aggravated the situation.

On the whole, many of the findings are given credence by the summary of Hance that:

> "in Africa, some of the danger signals of population pressure are the use of excessively steep slopes; declining crop yields, a trend towards some soil tolerant crops such as manioc, disputes over land, land fragmentation, excessive small holdings and landlessness among the rural people, some type of out-migration, under-employment and unemployment in the rural areas" (Hance, 1968).

(8) Involvement of other variables in the population-agriculture relationship.

The study has also revealed that the relationship between population and agricultural land use does not essentially exclude the influence of other factors. The Krobo have traditions, institutions, norms and values which encourage rapid population growth and agricultural intensification. One of these social factors is the patrilineal system of inheritance which induces the Krobo to crave for new lands, not only for themselves, but also for their children and their grand children. It is this same factor that makes the Krobo acquire individual holdings, a system quite different from the communal system of land holding practised by the Akan neighbours (Hill, 1961). Linked with this inheritance system

is the Krobo tradition which makes it mandatory for a man to accept the children of his unmarried daughter as his children and provide land property for the male ones. It has been noted that these children have equal inheritance right to his landed property as his own children. This arrangement usually gives a man a large number of male children for whom he must provide land.

The Krobo's unwillingness to be assimilated into other ethnic communities is also neither a population nor an agricultural factor that has influenced agricultural development in the District. For fear that they might be assimilated by their Akan neighbours, the Krobo formed land acquisition groups as their method of acquiring land from their Akan neighbours in a contiguous manner from the Krobo Mountain to the Afram Plains. Even now that land shortages have forced some of them out of the district, they adhere strictly to this tradition and live in Krobo community enclaves in predominantely Akan territory.

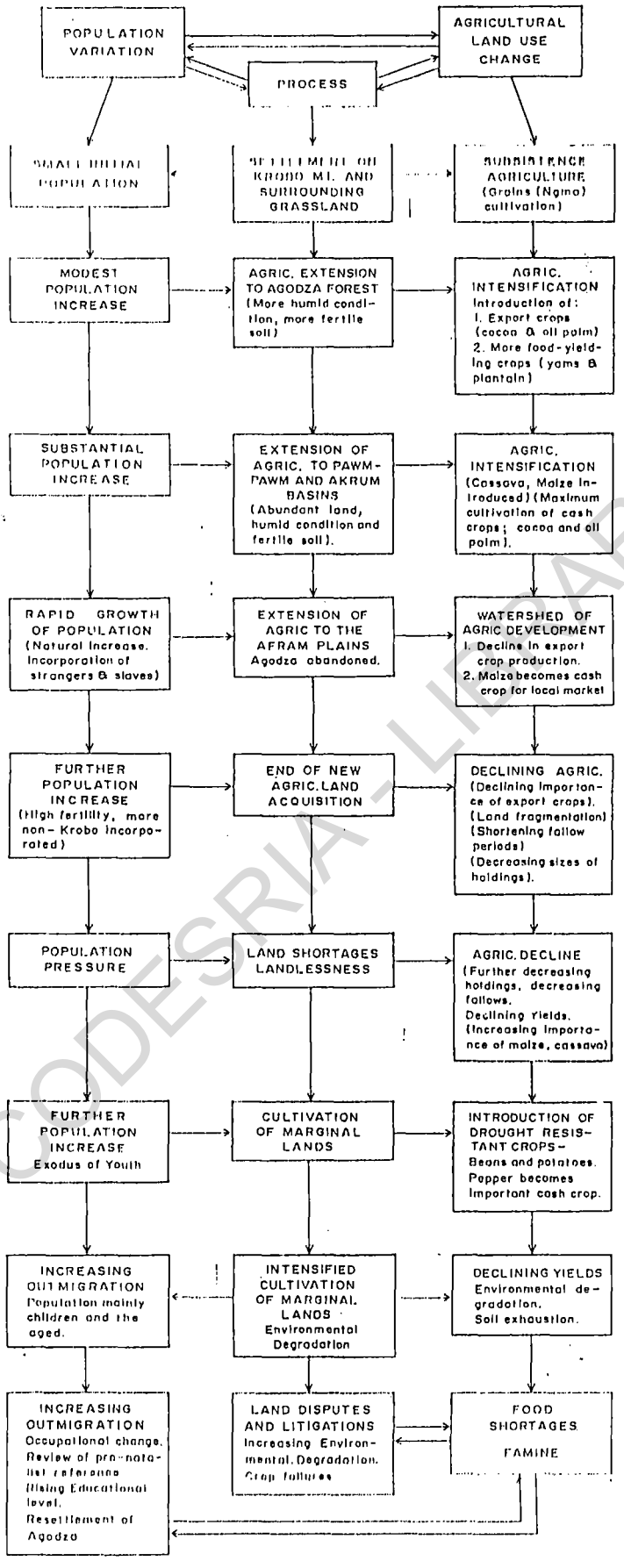
In terms of population change, the history, traditions and social values of the people have also played remarkable part. The desire for a large population for military purposes during the migratory period of the people made the Krobo population open for migrant assimilation. This was evident while they resided on the Krobo Mountain where they accepted and assimilated people of Akan and Ewe origin into their population. It was the same desire for a large population that encouraged the acceptance of strangers and slaves into the population during the period of cocoa and palm oil boom.

The physical environment also partly influenced population change and agricultural intensification. The strategic position and nature of the Krobo Mountain attracted many non-Krobo who were fleeing from threats of war and conflict. As a result the small population that originally settled on the Krobo Mountain increased into a large community. Similarly, the more humid forest conditions in Upper Krobo, particularly Agodza, attracted the Krobo who re-located their main agricultural activities from the less humid plain in Lower Krobo. One might ask if the Krobo would have been the famous farmers that they are if they had remained on the grassland in Lower Krobo. Lastly, the formation of the Volta Lake reduced substantially the agricultural land formerly owned by the Krobo and increased pressure on the remaining land. This factor, to some extent, accounts for the agricultural intensification in the district at present and the migration waves that now characterize the district.

The external economy equally needs to be mentioned. With the advent of the cocoa and oil palm era between the turn of the century and 1950, land was acquired and cultivated intensively thus extending the agricultural land. During the period too, many non-Krobos came to the area to avail themselves of the booming economic conditions. Additionally the "market population" that purchase agricultural produce from the district encouraged more intensive cultivation of the land.

The last of these factors is the attitude of the Akans towards the Krobo land acquisition process. The Akan neighbours adopted

Fig. 6·1 POPULATION – AGRICULTURAL LAND USE RELATIONSHIP IN THE MANYA KROBO DISTRICT



Source: Student's own work

(1) Introduction of co-operative agriculture

The Krobo should be persuaded to give up the individual holdings for co-operative farming with the family as the unit of the co-operative societies. Under this family co-operative system, all people who qualify to inherit family ancestral land could come together and cultivate the land co-operatively. By this arrangement, the traditional fear surrouding any alienation of ancestral land could be minimized. Such an arrangement will equally reduce the level of land fragmentation and landlessness. Under this co-operative farming, too, each family could qualify for credit facilitates to enable the members develop their farm to a level which would produce enough for both self sustenance and the market. The formation of such co-operative societies will also make it possible for the farmers to get access to farm inputs that will make possible greater intensification of land use with minimal environmental degradation.

(2) Establishment of manufacturing industries in the district

It is further proposed that labour-intensive manufacturing industries should be located at Odumase and Asesewa to draw a proportion of the population from the agricultural land. Such industries should be agro-based to process the agricultural produce from the co-operative farms. The project will have the additional advantage of providing market for the agricultural produce. For such an economic venture to be viable in such a rural environment,

it must be given incentives in the form of tax concession and industrial protection.

(3) Preservation of the unity among the people

To safeguard the unity of the people, the traditional provision that major Krobo rites and customs, including the burial of the dead, should be performed in the capital (Lower Krobo) should be strictly enforced. Though this measure could have very serious economic implications for bereaved families, it would strengthen the cultural links among the Krobo at home and those in dispersion.

(4) Demarcation of boundaries between the Krobo and their Akan neigbours

The Government should set up a committee (Jackson, 1959) to investigate alleged harrassments of Krobo farmers at the boundaries with Akan neighbours with the object of demarcating these boundaries and establishing peace at such areas, thus encouraging increased agricultural production in the district.

(5) Diversification of agriculture

The Krobo should be encouraged, through the Extension Division of the Ministry of Agriculture, to diversify their agricultural system; incorporating animal husbandry into the system. Such ventures like sheep rearing, poultry, rabbitry, bee-keeping and piggery should be encouraged on commercial bases in the forest area of Upper Krobo while cattle rearing should be attempted in the

grassland areas of Lower Krobo. Under cattle rearing, the Manya Krobo District should acquire part of the Accra Plains south of the Krobo Mountain for people who would like to go into large scale cattle rearing. It is assumed that such diversification would serve as a pressure release on the arable lands.

(6) Intensification of family planning programme

There should also be an intensification of the family planning programme in the district. In this exercise, there should be a programme of education to change the preference for large families characteristic of the traditional rural Krobo. It is further proposed that the traditional "Dipo" puberty rite of the Krobo should be examined critically and refined to make it attractive to both christians and non-christians. In the refined form, emphasis should be on the age at which the rite should be performed. It should be prohibitive to have the rite performed for any girl under the age of fifteen years. This will shorten the reproductive period of the women and help to slow down the growth of the population.

(7) Intensification of education

The District Assembly should make it mandatory for parents to send all their children to school with the hope that in future, many of these children will be employed in occupations other than agriculture. To help achieve this objective, a number of vocational institutions should be opened in the district to cater

for children who will not be able to pursue their education beyond the Junior Secondary School level.

(8) Involvement of government and non-government agencies in the solution of the problem

It is noteworthy that the problems being created as a result of the population-agricultural land use relationship in the Manya Krobo District tend to go beyond the district boundary. For example, the migrant Krobo farmers are taking with them their destruction of the forest for farming to their new areas of residence in the forest regions. Furthermore the declining crop yield being experienced in the district at present is likely to have negative impact on food supply in the south-eastern part of the country. Additionally, the drift of the people from the district is aggravating the socio-economic problems of the urban areas. For the solution of this complex problem, the need for regional and national assistance cannot be over-emphasized. Both governmental and non-governmental agencies have a role to play.

6.3 CONCLUSION

The study has shown the inter-relationship among phenomena in the human environment. It has not only underscored the fact that the causal relationship between population growth and agricultural land use change is mutual; it has equally shown that other variables are capable of influencing the relationship under study. These two findings have great significance for research

methodology; for, they articulate the importance of systems approach and inter-disciplinary work in research.

With regards to the general debate on the line of causation between population growth and agricultural land use change, the uni-directional causation between the two variables, postulated by both Malthus (1798) and Boserup (1965) is not given any verification by the field investigation. Instead, evidence in the field suggests that the causal relationship between the two variables is multi-directional; that is, population growth determines agricultural change and the latter equally induces population variations in an area. Caldwell stated this relationship clearly when he asserted that population growth and agricultural change affect each other (Caldwell 1975). Consequently, such a claim that there is no clear relationship between population density and intensification of agricultural land use (Metzner, 1982), is not validated by the study.

The findings of the study also have significance for any development planning policy for the Manya Krobo District. In the district, the rapid population growth is accompained by agricultural land use decline. To address the manifestations of these two processes there is the need to target both variables of rapid population growth and agricultural decline. Anything less than this may not be rewarding; for, the gains in reducing the effects of one process may be eroded by the negative manifestations of the other process that remains untouched. The people of the district also have a role to play in addressing the problem. They must

change their way of life so as to reduce their fertility level and promote improved agricultural land use. For example, the population (society) must raise the level of its family planning implementation and be flexible enough to allow the introduction or intensification of such modern methods of agriculture as rotation of crops, manuring, seed selection and mechanization where necessary. The introduction/intensification of such scientific methods and the reduction in fertility level will, hopefully, lead to sustainable growth and minimize the effects of population pressure.

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APPENDIX I

POPULATION-LAND RELATIONS

By

R.N. PROTHERO

1. The basic characteristics are

   1:1 Traditional ——modern

   1:2 Extensive ——— intensive

   1:3 Fluid ———— fixed

2. The components are

   2:1 Land: Virgin —— increasing frequency of use) ———
   increasing intensity of use)

   ——— Total use of cultivable land

   2:2 Population: Low density ——— increasing numbers —

   ——High Density——Possible surplus rural population——

   ——seasonal/Permanent migration ——urban drift

   2:3 System: Predatory: shifting cultivation ———

   —— Rotational cultivation—semi permanent cultivation—

   —— Increasing length of cultivation period ———

   —— Decreasing length fallow period ——Manuring and
   fertilizing

   2:4 Crops: Subsistence food crops——Decreasing ———
   importance

——————cash (food and export) crops increasing
importance

   2:5 Tenure: Communal rights to land ————

   ————Communal rights decresing) ——individual
   individual rights increasing) rights to land

   Land allocation by need ———land transfer by pledge,
   rent, lease or sale.

Fragmentation/dispersed holdings ——— Consolidated holdings

No permanent demarcation of holdings ——— Permanent demarcation of holdings

Source: R.N.Prothero "People and Land In Africa South of the Sahara" p.332.

APPENDIX II

FIELD INVESTIGATION

THE TARGET LOCALITIES

LOWER KROBO

(1) Akuse

(2) Kpong

(3) Odumase

AGODZA

(1) Akosombo

(2) Oborpa

AFRAM PLAINS

(1) Aframso

(2) Apam

(3) Dedeso

AKLUM BASIN

(1) Abesle

(2) Abetima

(3) Akotaa

(4) Abuorso

(5) Asedja

(6) Ayiesu

(7) Dorminase

(8) Ehiamenkyene

(9) Korwhere

(10) Nyornyum

(11) Osubeng

PAWMPAWM BASIN

(1) Adensu

(2) Adwenso

(3) Ahabaso Manya

(4) Akatawia

(5) Aketobuo

(6) Akateng

(7) Akokoma Sisi

(8) Akotue Tsrebuana

(9) Akrusu

(10) Apimsu

(11) Anyaboni

(12) Asesewa

(13) Aworworso

(14) Bisa

(15) Bormase

(16) Bukrum

(17) Dawa Yokuno

(18) Dzomoa

(19) Dzaman

(20) Korlewa

(21) Kwaopeniase

(22) Kwabia

(23) Kumakuma Sisi

(24) Osonson

(25) Osuom

(26) Otrokpe

(27) Ponponya

(28) Sekesua

(29) Seseamang

(30) Timersu

(31) Trawa Manya

APPENDIX III

CALCULATION OF THE DEATH RATE IN THE MANYA KROBO DISTRICT

Growth rate of the population = 1.2% per year.

P_1 = Population at 1984 = 134,814

P_2 = 1988 popultion = ?

$P_2 = P_{1e}^{rn}$

= 141,443

∴ Population in 1988 = 141,443

$$CDR = \frac{\text{Total Death}}{\text{Total Population}} \times 1000$$

$$= \frac{1,828}{141,443} \times 1000$$

= 13.6

∴ Death rate in the Manya Krobo District by 1988 was 13.6 deaths per 100 population.

CONFIDENTIAL

QUESTIONNAIRE FOR A STUDY ON "POPULATION AND AGRICULTURAL LAND USE IN THE MANYA KROBO DISTRICT"

Serial No. of Questionnaire:.....

NAME OF VILLAGE/LOCALITY: .....

NAME OF DIVISION:.....

ADDRESS OF HOUSE: .....

DATE OF INTERVIEW: .....

DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT

UNIVERSITY OF GHANA

LEGON.

SCHEDULE A: PERSONAL DATA

1. Age ☐ 2. Sex: Male ☐ Female ☐

3. Marital Status:- (a) Single
(b) Married
(c) Divorced
(d) widowed ☐ Marital Code

4. If Married, how many wives do you have? ☐

5. How many are alive ☐

6. How many children do you have?

1st Wife	(a) Male	☐
	(b) Female	☐
2nd Wife	(a) Male	☐
	(b) Female	☐
3rd Wife	(a) Male	☐
	(b) Female	☐
4th Wife	(a) Male	☐
	(b) Female	☐
Other Wives	(a) Male	☐
	(b) Female	☐
Total No. of Children	(a) Male	☐
	(b) Female	☐

7. How many children are alive? (a) Male ☐
(b) Female ☐

8. Complete the table on the children you have

Group of Children		No. of Females	No. of Males
(a)	(0 - 5 years)	.....	.....
	(6 - 15 years)	.....	.....
(b)	(16 - 30 years)	.....	.....
	(31 - 45 years)	.....	.....
	Total of (b)	.....	.....
(c)	(46 - 64 years)	.....	.....
(d)	(Over 64 years)	.....	.....

9. How many of the children are dead: (a) Male ☐

(b) Female ☐

9. Complete the following table on your children's education:

J.S.S

Child	Age Group	No. of Children	Educational Level attained
1st Child			
2nd Child			
3rd Child			
4th Child			
5th Child			
6th Child			
7th Child			

Age Group Code
(a) 0 - 15 years
(b) 6 - 10 years
(c) 11 - 15 years
(d) 16 - 21 years
(f) Over 30 years

Educational Level Code
(a) Primary School
(b) Middle School
(c) J.S.S
(d) Senior Secondary
(e) Teacher Training
(g) Diploma

(h) University
(i) Post-graduate
(j) Others (Specify)
(k) No Formal Education

10. How many of your children are with you now? (a) Male ☐

(b) Female ☐

11. How many have moved to other areas?

(a) Farming areas in District
(b) Farming areas outside District
(c) Commercial towns in District
(d) Commercial towns outside District

Destination of migrant children

12. Which of the following relatives were alive when the Krobos came down the Krobo Mountain in 1892?

Ancestor Code ☐

(a) Father

(b) Grandfather

(c) Greatgrandfather

13. What is your own educational status?

(a) No formal education

Specify .....

(b) 1st Cycle

(c) 2nd Cycle Educational Status Code ☐

(d) Tertiary Education (Specify)
(i) Teacher Training

(ii) Diploma

(iii) 1st Degree

(iv) 2nd Degree

(v) 3rd Degree

14. What is your profession
    (a) Farming — Specify .....
    (b) Trade (specify) — Professional Code
    (c) Teaching
    (d) Accountancy
    (e) Others (Specify)

15. What is your yearly income from: (a) Arable farming
    (b) Animal farming
    (c) Other Sources (Specify): .....

SCHEDULE B. LAND ACQUISITION, OWNERSHIP AND SETTLEMENT DATA

16. Is the land on which you live a family one or personal one?

    Family ____ Personal ____

17. If a personal one, when was it acquired?

    (a) Before 1900
    (b) Between 1900 and 1914
    (c) Between 1914 - 1928
    (d) 1928-1940
    (e) 1940-1950
    (f) 1950-1960
    (g) 1960-1970
    (h) 1970-1980

    Time of Land acquisition Code ____

18. If personal, how was the land acquired?
    (a) through purchase
    (b) by occupation
    (c) on share crop basis

    Land Purchase Code ____

19. If by purchase, how did you hear about the sale of the land
    (a) through a relative

    (b) through a friend

    (c) through a clan member — Information Code

    (d) through sisters husband — [ ]

    (e) through Huza member

    (f) through a maternal relation

20. What was the cost of the land?
    (a) Below £1

    (b) £1 - £5

    (c) Over £5

    (d) Below ¢10,000

    (e) ¢11,000 - ¢20,000

    (f) ¢21,000 - ¢50,000

    (g) Over ¢50,000

21. From whom was the land originally bought?
    (a) Not known

    (b) a Krobo

    (c) the Akwapims

    (d) the Akyems

    (e) the Akwamus

    (f) Others (Specify) [ ] Code

22. If land is a family one, who first acquired it?
    (a) Father

    (b) Grandfather

    (c) Greatgrandfather — Family first owner code [ ]

23. When did he acquire the land?

Use code for question 17

[ ]
Original time acquisition code

24. What was the cost of the land?
(a) Below £1

(b) £1 10/- - £2

(c) £2 10/- - £3

(d) £3 10/- - £5

(e) Over £5

(f) Not known

25. From 1892 when the Krobos came down the Krobo Mountain, they settled at various places from the mountain to the Afram Plains.

Complete the table below appropriately with a tick ( )

Area	Ever Holding	Present Holding	Abandoned Holding	Time Abandoned	Time Resettled
Lower Krobo					
Agodza					
Pawnpawn Basin					
Akrum Basin					
Afram Plains					
Lower Krobo (R)					
Agodza (R)					

26. Give reasons for the abandonment

(a) Lower Krobo .....

(b) Agodza .....

(c) Pawnpawn Basin .....

(d) Akrum Basin .....

(e) Afram Plains.....

(f) Lower Krobo (R) .....

(g) Agodza (R) .....

27. How many people were on the land at the time of settlement and abandonment?

Area	Time of Settlement	Time of Abandonment
(a) Lower Krobo		
(b) Agodza		
(c) Pawnpawn Basin		
(d) Akrum Basin		
(e) Afram Plain		
(f) Lower Krobo (R)		
(g) Agodza (R)		

28. Is land still readily available for purchase in the Manya Krobo District?

Yes ☐ No ☐

29. If No, give reasons. Number codes in order of importance.

(a) Shortage of land

(b) increase in population

(c) flooding of land by the Volta Lake

(d) unwillingness of landowners to sell land

(e) landowners are turning to farming

(f) Other reasons (Specify) .....

30. What is the reaction of members of family to this land shortages. Number in order of importance.

(a) members are turning away from farming

(b) members have moved outside for new lands

(c) members have moved to towns for work

(d) members have migrated outside country

(e) members resettled on other land in District

(f) members have returned to Lower Krobo for non-Agric. work

31. From whom was the family land originally acquired? Use code for question 20.

☐ Original owner code.

32. Is there any document on the purchase of the land?

Yes ☐ No ☐

33. If Yes, who gave the document? .....

.....

.....

34. Was the "yibapom" rite performed? Yes ☐ No ☐

35. Has there been any dispute over the land since its acquisition? Yes ☐ No ☐

36. If Yes, complete the table below:

No. of dispute	Types of disputes	Level of disputes	Duration of disputes	Amount Spent	Settled Pending
1st					
2nd					
3rd					
4th					

Type of dispute code

(a) boundary (within Huza)

(b) boundary (inter Huza)

(c) boundary (inter chiefdom)Specify.....

(d) ownership (intra-family)

(e) ownership (intra clan)

(f) ownership (intra state)

Level of dispute code

(a) family head

(b) Huzatse

(c) Konor

(d) Police

(e) District Court[1]

(f) District Court[2]

(g) High Court

SCHEDULE C: AGRICULTURAL PRACTICE DATA

37. Has the family other holdings apart from the one on which you live now?

(a) Within the Huza No ☐ Yes ☐

If yes, at what places: .....

.....

.....

(b) Outside the Huza Yes ☐ No ☐

If yes, name the places: .....

.....

.....

38. Has any of these holdings been acquired by any means other than outright purchase?

Yes ☐ No ☐

39. If yes, indicate the means

(a) by mortage

(b) on share crop basis

(c) as gift (specify) .....

(d) by the cutlass .....

Holding acquisition code ☐

40. What implement did/do you use at the following localities?

	Implement Code
Lower Krobo	
Agodza	cutlass
Pawnpawn Basin.....	hoe
Akrum Basin.....	axe
Afram Plains	tractor
Lower Krobo (R)	chainsaw
Agodza (R)	

41. What was/is the main source of labour. Tick ( ) the appropriate column

Area of Settlement	The Family	Hired	Company	"Hudom"
Lower Krobo				
Agodza				
Pawnpawn Basin				
Akrum Basin				
Afram Plains				
Lower Krobo (R)				
Agodza (R)				

42. What is the role of the following in farming operation? Tick ( ) where appropriate.

	Clearing	Sowing	Weeding	Harvesting
Men	.....	.....	.....	.....
Women	.....	.....	.....	.....
Children	.....	.....	.....	.....
Outside labour	.....	.....	.....	.....

43. Which were/was the main cash crops

	Oil Palm	Cocoa	Sugarcane	Cotton
Lower Krobo (LK)	.....	.....	.....	.....
Agodza	.....	.....	.....	.....
Pawnpawn Basin(PB)	.....	.....	.....	.....
Akrum Basin (AB)	.....	.....	.....	.....
Lower Krobo (R)	.....	.....	.....	.....
Agodza (R)	.....	.....	.....	.....

44. Which of the following crops were/are also grown? Tick ( ) where appropriate

	Yam	Plantain	Cassava	Pepper	Beans	Potatoes
L.K	.....	.....	.....	.....	.....	.....
Agodza	.....	.....	.....	.....	.....	.....
P.B	.....	.....	.....	.....	.....	.....
A.B	.....	.....	.....	.....	.....	.....
L.K (R)	.....	.....	.....	.....	.....	.....
Agodza (R)	.....	.....	.....	.....	.....	.....

45. Which species of cassava are/were grown? Arrange in order of predominance

	1st	2nd	3rd
Lower Krobo	.....	.....	.....
Agodza	.....	.....	.....
Pawnpawn Basin	.....	.....	.....
Akrum Basin	.....	.....	.....
Afram Plains	.....	.....	.....
Lower Krobo (R)	.....	.....	.....
Agodza (R)	.....	.....	.....

46. Which species of yams were/are grown. Arrange in order of predominance

	1st	2nd	3rd
Lower Krobo	.....	.....	.....
Agodza	.....	.....	.....
Pawnpawn Basin	.....	.....	.....
Akrum Basin	.....	.....	.....
Afram Plains (AP)	.....	.....	.....
Lower Krobo (R)	.....	.....	.....
Agodza (R)	.....	.....	.....

47. Was/is fertilizer used on the holding

	Yes	No	Type
Lower Krobo	.....	.....	.....
Agodza	.....	.....	.....
Pawnpawn Basin	.....	.....	.....
Akrum Basin	.....	.....	.....
Afram Plains	.....	.....	.....
Lower Krobo (R)	.....	.....	.....
Agodza (R)	.....	.....	.....

Type Code
Chemical Fertilizer
Composite Manure
Animal Refuse

48. Chemical fertilizers were used, for which main crops. Crops in order of importance

Lower Krobo	.....	.....	.....
Agodza	.....	.....	.....
Pawnpawn Basin	.....	.....	.....
Akrum Basin	.....	.....	.....
Afram Plains	.....	.....	.....
Lower Krobo (R)	.....	.....	.....
Agodza (R)	.....	.....	.....

49. Which were/are the main markets for the various farming areas:

L.K Agodza P.B A.B A.P L.K (R) Agodza (R)

.....

.....

.....

.....

Market Code

1. Akuse	7. Asesewa
2. Adjina	8. Sekesua
3. Obenyemi	9. Ehiamitsiri
4. Otrokpe	10. Akateng
5. Apemsu	11. Buohu/Buoso
6. Bisa	12. Others (Specify)

50. What is/was the means of transport to the market?

Lower Krobo .....

Agodza .....

Pawnpawn Basin .....

Akrum Basin .....

Afram Plains .....

Lower Krobo (R) .....

Agodza (R) .....

Means of transport code

1. Head portage
2. Carts
3. automobile (lorries)

SCHEDULE D: LAND FRAGMENTATION DATA

51. What was the size of the original family holding in 'ropes'? ☐

52. What was the width of the 'rope' in yards? ☐

53. How many times has the holding been fragmented since it was purchased? ☐

54. How many people inherit the holding present? ☐

55. What is the largest number of people that have title to the holding? ☐

56. Is each holding still large enough for economic exploitation?

Yes ☐ No ☐

57. If no, what is the re-action of the members of the family?

(a) abandoning the holdings

(b) merging holdings for co-operative farming

(c) selling the holding?

(d) mortgaging the holdings

(e) giving out holdings on share-crop basis.

Re-action code ☐

58. Will members of the family agree to merge their small holdings for co-operative farming?

Yes ☐ No ☐

59. If no, what are the major impediments? Rank the impediments in order of importance

(a) .....

(b) .....

(c) .....

(d) .....

(e) .....

60. If the government wants to acquire the holdings of the Huza for large scale scientific farming for higher yields, would the family willingly give up its holding?

Yes ☐ No ☐

61. If no, what are the reasons?

(a) .....

(b) .....

(c) .....

(d) .....

(e) .....

SCHEDULE E: VEGETATIONAL CHANGES DATA

62. What was/is the type of vegetation at the various farming areas?

Areas	At time of settlement	Time of abandonment
Lower Krobo		
Agodza		
Pawnpawn Basin		
Akrum Basin		
Afram Plains		
Lower Krobo (R)		
Agodza (R)		

Vegetation Code

1. Thick virgin forest
2. Thick secondary forest
3. Light secondary forest
4. Bush with "Dzukwewi Apunyutso"
5. Bush with "Agblafo"
6. Bush with "Achiapong"
7. Bush with tall grass
8. Tall grass (J.J)
9. Short grass

63. Which crops are most suitably grown under the following vegetation types? Rank them in order of importance

		1st	2nd	3rd
(a)	Thick virgin forest	.....	.....	.....
(b)	Thick secondary forest	.....	.....	.....
(c)	Light secondary forest	.....	.....	.....
(d)	Bush with "agblafo"	.....	.....	.....
(e)	Bush with "Dzukwewi Apunyutso"	.....	.....	.....
(f)	Bush with "Achiapong"	.....	.....	.....
(g)	Tall grass (J.J)	.....	.....	.....
(h)	Short grass	.....	.....	.....
(i)	Alluvial soils of Afram Plains	.....	.....	.....

Crop Code

1. Oil Palm
2. Cocoa
3. Yams
4. plantain
5. cocoyam
6. cassava
7. Vegetables
8. Beans
9. sweet potatoes
10. maize
11. rice
12. sugarcane
13. cotton

64. What is/was the length of the fallow period at the various farming areas?

	Time of Settlements	Time abandoned/Present
Lower Krobo	.....	.....
Agodza	.....	.....
Pawnpawn Basin	.....	.....
Akrum Basin	.....	.....
Afram Plains	.....	.....
Lower Krobo (R)	.....	.....
Agodza (R)	.....	.....

Fallow period code

(a) 1 year (c) 5 - 7 years (e) 10 - 12 years

(b) 2 - 4 years (d) 7 - 9 years (f) 13 - 20 years

(g) Over 20 years

65. How many times has bush-fire occurred in your holding in the last 10 years?

(a) none
(b) 1 - 3 times
(c) 4 - 6 times
(d) 7 - 10 times

Bush fire code ☐

66. What is the commonest cause of the bush fire?

(a) Burning of farms
(b) Burning of plots for nursery
(c) Cigarette light
(d) Lightening
(e) Hunter's fire
(f) others (Specify) .....

Cause of Fire Code ☐

SCHEDULE F: OTHER ECONOMIC ACTIVITY DATA

67. Which economic activities, apart from farming, takes place in your holding and what is the produce?

	Type	Produce
Mining	.....	.....
Manufacturing	.....	.....
Fishing	.....	.....
Lumbering	.....	.....

68. Which plants in the area are exploited for timber? Rank them in order of importance

(a) ..... (b) ..... (c) ..... (d) .....

69. Which plants are exploited for other economic uses

	Name of Plant	Uses
(a)	.....	.....
(b)	.....	.....
(c)	.....	.....
(d)	.....	.....
(e)	.....	.....
(f)	.....	.....

70. What is the size of the household now?

(a) Total ☐ (b) Male ☐ (c) Female ☐

71. How many people in the household are in the following age groups?

	Total	Male	Female
(a) 1 - 5	☐	.....	.....
(b) 6 - 15	☐	.....	.....
(c) 16 - 20	☐	.....	.....
(d) 21 - 30	☐	.....	.....
(e) 31 - 45	☐	.....	.....
(f) 46 - 64	☐	.....	.....
(g) Over 64	☐	.....	.....

72. Estimate the size of the household at the following times

	Total	Male	Female
(a) By 1900	.....	.....	.....
(b) End of 1st World War	.....	.....	.....
(c) Independence Time	.....	.....	.....

(d) 10 years ago ....

(e) Now ....

73. What is the educational background of the members of family at present?

	Total No.	Male	Female
(a) No formal education	.....	.....	.....
(b) Completed 1st Cycle	.....	.....	.....
(c) Completed 2nd Cycle	.....	.....	.....
(d) Completed Tertiary	.....	.....	.....
(i) Diploma	.....	.....	.....
(ii) Graduates	.....	.....	.....
(iv) Post-graduates	.....	.....	.....

74. How many members of the household are engaged in farming

Total ..... ☐

Male ..... ☐

Female ..... ☐

Children (15) ..... ☐

16 - 30 years ..... ☐

75. What is the most preferable family size in the household?

(a) 1 - 2 (d) 7 - 8

Family Size Code

(b) 3 - 4 (e) 9 - 10

(c) 5 - 6 (f) Over 10

76. Give reasons for the preference

(a) .....

(b) .....

(c) .....

77. How many members of family are engaged in other professions other than farming?

Total ..... ☐

Male ..... ☐

Female ..... ☐

Under 30 years ..... ☐

30+ years ..... ☐

78. What are their main professions

(a) .....

(b) .....

(c) .....

(d) .....

(e) .....

79. How many of these "professionals" depend on the holding for food or money?

Total ..... ☐

Adults ..... ☐

Children (for fees) ..... ☐

80. How many members are related to the family (Weku) in the following ways

(a) Paternally ☐

(b) Maternally ☐

(c) Strangers (slave origin) ☐

(d) Others (Specify) ☐

SCHEDULE H: MIGRATION DATA

81. Has the family (household) migrated from other parts of the Manya Krobo District to the present settlement?

Yes No

82. If yes, from which farming areas

(a) Lower Krobo
(b) Agodza
(c) Pawnpawn Basin
(d) Akrum Basin
(e) Afram Basin
(f) Lower Krobo (R)
(g) Agodza (R)

Source region code
Name of specific area

1st ☐
2nd ☐
3rd ☐
4th ☐

83. What was the cause of the movement?

(a) Low productivity
(b) Land shortage
(c) Local conflict (with Krobo)
(d) External conflict (with non-krobos)
(e) Outbreak of disease
(f) Flooding of land
(g) To grow crops
(h) Other reasons (specify).....

Cause of movement code ☐

84. is the family planning to migrate from the present Huza to another area?

Yes ☐ No ☐

85. If yes, to which place?

(a) another part of the district (Name it)
(b) cocoa growing areas of Ghana
(c) a city area (Name)
(d) Lower Krobo

Destination Code ☐

86. Give reasons for the intended migration

(a) to look for new farming land
(b) to work in industry
(c) for the 'bright light' of urban areas
(d) offer labour in cocoa areas
(e) escape degradation in the environment

☐ Reasons for migration code

87. Have some members of the household travelled outside the district?

Yes ☐ No ☐

88. If yes, how many?

Male ☐ Female ☐

Children (15-) ☐

If yes, complete the following table

	Age	Destination	Duration of Stay	Time	Reason
1st person	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)
2nd person	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)
3rd person	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)
4th person	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)
5th person	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)
6th person	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)	(a) (b) (c)

Destination Code

(1) Ghana (Name Region)....
(2) Togo
(3) Nigeria
(4) Cote d'Ivoire
(5) Europe (Name Country) .....
(6) Middle East (Name Country)....
(7) America (Name Country).....
(8) Other (Specify).....

Reason Code

(a) Work as Tradesman (Specify) .....
(b) Work as Professional(") .....
(c) to trade (in what) .....
(d) to visit relative
(e) "To tour"

For those who go to other farming areas in Ghana, complete the following table.

	Destination		Farming Activity	Yearly Income	Duration	Property Owned
	Region	Area				
1st person						
2nd person						
3rd person						
4th person						
5th person						
6th person						

What is the effect of the outmovement on agriculture/on your holding?

(a) .....

(b) .....

(c) .....

(d) .....

(e) .....

What remittances do the migrants send/bring home to help agriculture?

(a) money for capital in agriculture

(b) fertilizer

(c) seeds (Specify) .....

(d) automobiles

(e) other capital goods (Name) .....

(f) building materials (Name) .....

(g) Others (specify).....