

WEST AFRICAN UNCONTROLLED SETTLEMENTS AND THE INTRA-URBAN MOBILITY MODEL

A CASE STUDY OF A SECONDARY CITY, JOS, NIGERIA

Thesis submitted by: HIRSE, S.O.

In accordance with the regulations for the award of:-

Degree of PhD (URBAN STUDIES)

DEPARTMENT OF GEOGRAPHY

UNIVERSITY OF SALFORD

SALFORD M5 4WT

LANCS.

DATE: OCTOBER 1984.

TABLE OF CONTENTS

	<u>Page</u>
CHAPTER ONE: INTRODUCTION	1
Aim of the study	5
Scope and extent of the study	11
Data Source and Methodology	16
Structure of the study	17
 CHAPTER TWO: TURNER'S MODEL OF INTRA-URBAN MOBILITY AND THE PHENOMENON UNCONTROLLED SETTLEMENTS	 23
Turner's Housing Priority Model	25
Turner's ecological model	27
Assumptions of Turner's model	30
Migratory patterns and social mobility	35
The role of the city centre as the reception node	38
The role of kinship relationships in the integration of new migrants	40
Location of employment opportunities and the new arrived migrants	42
Conclusion	43
 CHAPTER THREE: BACKGROUND OF THE STUDY AREA	 47
Physical setting and the economic development of Jos	47
Settlement patterns	52
Housing problems in Jos	57
Land problems	61

CONTENTS (Continued)

Page

Development approach	62
The impact of Tin Mining on the city of Jos	63
Problems associated with mining leases and their compulsory acquisition	66
The growth of uncontrolled settlements in the city	72
The study areas: their setting and general physical characteristics	73
Attitude of the Authority towards uncontrolled settlements	82
Ethnic relations in Jos	83
Conclusion	86
CHAPTER FOUR: TURNER'S INTRA-URBAN MOBILITY MODEL AND JOS UNCONTROLLED SUB-AREAS	88
Port of entry of the newly arrived migrants to Jos	88
The role of kinship relationships in the integration of new migrants in Jos	90
Location of employment and bridgeheaders in Jos	94
Rural-urban migrants and social mobility in Jos	97
Observations	99

CONTENTS (Continued)

Page

CHAPTER FIVE:	DETERMINING LIKELY CONSOLIDATORS USING CHI-SQUARE TEST	101
	The chi-square test	102
	Synopsis of the procedure - Chi-square test	103
	Tests of association between plot ownership in the city and the propensity to stay permanently in the city	107
	Tests of association between permanent migration and reason for inhabiting an uncontrolled subarea in Jos	112
	A brief discussion of the results	118
	Conclusion	120
CHAPTER SIX:	STATISTICAL DEPENDENCY RELATIONSHIP BETWEEN PLOT OWNERSHIP IN JOS, MIGRATORY PATTERN AND RECEPTION NODES IN THE CITY	121
	Some basic principles of the Log-linear model	121
	The hypothesis of mutual independence	126
	The hypothesis of multiple independence	127
	The hypothesis of conditional independence	128
	The hypothesis of pairwise association	128
	The Saturated model hypothesis	129
	Parameter estimates and model selection	130
	Tests of relationships between plot ownership in Jos, propensity to stay permanently in the city and area of residence in the city	132

CONTENTS (Continued)

Page

Model selection	133
Interpretation of the best-fit model:	
pairwise association model	137
The association between plot ownership and area of residence is independent of intended length of stay categories	138
The association between plot ownership in the city and intended length of stay is independent of area of residence	140
The association between intended length of stay in the city and area of residence is independent of plot ownership categories	141
A brief discussion of the results	143
Conclusion	144

CHAPTER SEVEN: TESTS OF RELATIONSHIPS BETWEEN PLOT OWNERSHIP IN THE HOMETOWN, TYPE OF MIGRATION AND AREA OF RESIDENCE IN JOS	147
Model selection	150
Interpretation of the best-fit model:	
Saturated model hypothesis	152
The association between plot ownership in the hometown and area of residence in Jos is dependent on categories of intended retirement areas	153

The association between plot ownership in the hometown and intended retirement in the hometown is dependent on area of residence in the city	156
--	-----

The association between area of residence in Jos and intended retirement in the hometown is dependent on plot ownership in the hometown	159
--	-----

Tests of relationship between plot ownership in the hometown and type of migration by area of residence in the city	162
---	-----

Tests of relationship between plot ownership in the city and type of migration by area of residence in the city	166
---	-----

Conclusion	171
------------	-----

CHAPTER EIGHT: A TYPOLOGY OF UNCONTROLLED SUBAREAS	173
--	-----

Jos uncontrolled subareas and self help building policy	173
--	-----

Underlying dimensions of variation between uncontrolled subareas	180
---	-----

Association analysis	188
----------------------	-----

Results of the association analysis	190
-------------------------------------	-----

Conclusion	199
------------	-----

CHAPTER NINE: TOWARDS A POLICY FOR A MORE CONTROLLED URBAN DEVELOPMENT IN NIGERIA	201
--	-----

National urbanisation policy	204
------------------------------	-----

CONTENTS (Continued)Page

	Local strategies	207
	Alternative sources of low cost housing	208
	Public sector housing	210
	Private sector housing	211
	Self help housing	213
CHAPTER TEN:	CONCLUSION	217
REFERENCES		231
<u>APPENDICES</u>		
APPENDIX I	The Survey Questionnaire	247
APPENDIX II	Unified Salary Structure for the Public Sector	253
APPENDIX III	Table of Chi-squares (χ^2)	254
APPENDIX IV	Results of the Log-linear modelling; Plot ownership in Jos (PL) propensity to stay permanently in the city (L) and respondent's area of residence in the city (A)	255
APPENDIX V	Results of the Log-linear modelling; Plot ownership in the rural hometown (PLH) intended retirement in the hometown (RT) and area of residence in the city (A)	267
APPENDIX VI	Results of the tests of mutual independence between plot ownership in the hometown (PH) and intended retirement in the hometown (RT) by study area	280
APPENDIX VII	Results of the tests of mutual independence between plot ownership in the city (PL) and intended permanent stay in the city (L) by study area	285

LIST OF FIGURES

	<u>Page</u>
FIGURE 1: Diagramatic Structure of the Study.	22
FIGURE 2A: Turner's income levels and residential priorities.	26
FIGURE 2B: A Typical plan of housing found in the study areas.	79
FIGURE 3: Summary of the effects of varying migratory characteristics on the development of physical characteristics in uncontrolled settlements.	185
FIGURE 4: Dendogram showing the results of Association Analysis of the combined data set.	191
FIGURE 5: Dendogram showing the results of the Association Analysis of Dadin Kowa sample.	192
FIGURE 6: Dendogram showing the results of the Association Analysis of Tudun Wada sample.	193
FIGURE 7: Dendogram showing the results of the Association Analysis of Kabong sample.	193
FIGURE 8: Dendogram showing the results of the Association Analysis of Jenta Adamu sample.	194
FIGURE 9: Dendogram showing the results of the Association Analysis of Anglo-Jos sample.	194

LIST OF TABLES

TABLE 1: Example of a (two-dimensional) contingency table.	104
TABLE 2: Cross tabulation: Plot ownership in the city by intended length of stay in the city.	108
TABLE 3: Cross tabulation: Plot ownership in the city by retirement in the hometown.	110

LIST OF TABLES (Continued)Page

TABLE 4:	Cross tabulation: Intended length of stay in the city by reason for staying in the study area.	113
TABLE 5:	Cross tabulation: Intended length of stay in the city by type of accommodation.	114
TABLE 6:	Cross tabulation: Plot ownership in the hometown by intended retirement in hometown.	115
TABLE 7:	Cross tabulation: Intended length of stay in the city by plot ownership in the hometown.	117
TABLE 8:	Three way contingency table, observed frequency distribution of responses; Plot ownership (PL) intended length of stay (L) and area of residence in the city (A) cross-classified.	124
TABLE 9:	Tests of association between plot ownership in the city, permanent migration and area of residence.	135
TABLE 10:	Observed/expected frequencies, plot ownership in the city, area of residence in the city and intended length of stay in the city cross-classified.	139
TABLE 11:	Observed/expected frequencies; intended length of stay in the city, area of residence and plot ownership in the city: cross classified.	146
TABLE 12:	Frequency distribution, plot ownership in the hometown, desire to retire in the hometown and area of residence in the city: cross-classified.	148
TABLE 13:	Tests of interaction between plot ownership in the hometown and area of residence in the city.	149

LIST OF TABLES(Continued)Page

TABLE 14:	Three-way table: Plot ownership in the hometown, area of residence in the city and propensity to retire in the hometown.	154
TABLE 15:	Three-way table: Plot ownership in the hometown by propensity to retire in the hometown by area of residence in the city.	157
TABLE 16:	Three-way table: Propensity to retire in the hometown by area of residence in the city by plot ownership in the hometown.	160
TABLE 17:	Observed frequency distribution; Plot ownership in the hometown by study area.	164
TABLE 18:	Tests of interaction between plot ownership in the hometown and the propensity to retire in the hometown and area of residence in the city.	165
TABLE 19:	Observed frequency distribution; Plot ownership in the city and intended length of stay in the city. Cross-classified by area of residence.	167
TABLE 20:	Tests of interaction between plot ownership in the city and intended permanent migration in the city by study area.	168

LIST OF MAPS

MAP 1:	Map of West Africa showing Nigeria's setting in the region.	6
MAP 2:	Map of Nigeria showing the national setting of Plateau State and the city of Jos.	48

LIST OF MAPS (Continued)

	<u>Page</u>
MAP 3: Map of Plateau State showing Jos and Local Government Administrative Areas.	49
MAP 4: Jos: early settlement pattern.	53
MAP 5: Map of Jos showing physical constraints to urban growth.	64
MAP 6: Jos-Plateau showing areas disturbed by mining.	67
MAP 7: Jos; existing town and mining leases.	68
Map 8: Jos; Summary of physical constraints to urban growth.	71
MAP 9: Map of Jos showing the location of the study areas.	74
MAP 10: Map of Plateau State showing Jos and Local Government Administrative Areas.	93

LIST OF PLATES

PLATE 1:	Above: A Panoramic View of the Low-Cost Housing, located along Miango Road, Jos.	
	Below: A close-up view of the low-cost housing units.	60
PLATE 2:	Above and Below: show the types of access of winding pathways found in the study areas, as well as the various types of construction and the lack of drainage.	77
PLATE 3:	Above: A view of Jenta-Adamu on the near-side and part of Kabong on the far side separated only by a small stream.	78

LIST OF PLATES (Continued)

Page

PLATE 3: Below: Part of Jenta Adamu showing the type of
organisation of housing found in the
study areas.

78

PLATE 4: Above and Below is a Panoramic View of the
outskirts of Tudun Wada showing the
Federal Government Secretariat in
the background

80

ACKNOWLEDGEMENT

This research has not been an easy work to undertake. Indeed, it has been to me a rather distressful experience. Undoubtedly, I must have afflicted some amount on other people. I would therefore like to express my profound gratitude to all those people who have, in one way or the other, helped me during the course of this research and whose time, guidance, criticism and concern I deeply appreciate.

In particular, I would like to mention that this research would not have begun without the scholarship award made to me by the Federal Government of Nigeria. This award has not only made the dream of conducting this research a reality but has also made the process relatively easier than it would have been without the award. In this respect, I would like to thank the staff of the Federal Ministry of Education, Scholarship Division, Lagos, and the staff of the Nigerian High Commission, Liverpool for their relentless cooperation in disbursing the necessary funds for the research.

I would also like to thank the entire staff of the Town Planning Office of the Plateau State Ministry of Lands and Survey, Jos, for their tremendous assistance during the course of my field work and for making available to me valuable reports and plans.

I am also grateful to Jean Bateson (Mrs) for undertaking the difficult task of typing the work; Dr. Martyn Senior and Dr. Anthony Gatrell for their immeasurable assistance and guidance with the analytical aspects of the study. I am equally grateful to the entire staff of the University Library and the Computing Centre for their immaculate services.

Above all, I must express my profound gratitude to my supervisor Professor M B Gleave for making his time and expertise readily available to me as well as for his immensely valuable tutorial help without which this study might not have been completed.

ABSTRACT

Turner's (1965, 1967, 1968) study of Lima's squatter settlements led to the view that uncontrolled settlements of the Third World cities are mainly a manifestation of the desires for housing ownership by people who are well integrated in the city and have experienced some amount of social mobility.

In his work, Turner (1968) advanced a theoretical model of intra-urban mobility in which rural-urban migration; upward social mobility, intra-urban mobility and the growth of spontaneous settlements are inter-related. Within this model, migrants are classified into three successive groups which corresponds with their level of involvement in gainful employment namely, 'Bridgeheader' i.e. the newly arrived migrants who are in search of employment or involved in low paid jobs, 'Consolidators' i.e. those who have had some urban experience and are in relatively better paid jobs; and 'Status Seekers' i.e. the upper class of low income group. Three housing priorities:- Location, security of tenure and quality of housing and environment were assigned to those class of migrants.

Upward economic and social mobility from a low paid job to a better paid job; is argued within this model, to be reflected in a housing priority and expectation about living conditions. Those who move from lower position in the social hierarchy to a higher position also move from inner city slums to the suburbs. In other words, social mobility necessarily entails spatial mobility within the urban environment. Security of tenure and improvement of the quality of housing are thus functionally related.

Consequently, it is recommended that stimulating those spontaneous activities as opposed to their eradication would benefit enormously from the resourcefulness of the squatters. Legalisation of land tenure, provision of infrastructural services and support for local neighbourhood organisation are some of the essential elements for a more healthy urban policy.

In this study attempt is made to test Turner's model of intra-urban mobility in a regional context of West Africa. The study specifically examines the validity of the model in relation to a secondary city of (Jos) Nigeria, and asks whether Turner's model which is based almost entirely on the migratory characteristics and experience of Latin America has gone far enough in acknowledging the various dimensions of Third World rural-urban migration in which some migrate permanently while others intend only a temporary migration as well as the varying types of uncontrolled subareas that have emerged as a result of these differences.

In most of West Africa, including Nigeria, rural-urban migration tends not only to be temporary in character but is also structured by kinship relationships. Within this migratory context, migrants do not strive to consolidate their stay in the city. They prefer cheap rental accommodation, with a view to consolidating their position in the rural home towns. Security of tenure does not therefore rank high in their order of priorities, their social mobility does not lead to a spatial mobility. Within this migratory context, the distinction between permanent and temporary migrants has more validity and practical application than Turner's bridgeheader - consolidator dichotomy, since bridgeheaders are likely to remain bridgeheaders while in the city.

Adopting the proposed distinction between permanent and temporary migrants provides a lot of insight into the ways in which migrant groups perceive the city environment and how their perception of the city in turn affects the development process of their settlement areas. Indeed, varying migratory characteristics leads to varying housing demands and housing ambitions in the city of migration. This also leads to variation in migrants reception areas in the city and thus affects the capacity of uncontrolled subareas to improve via self help housing. Thus, the distinction between permanent and temporary migrants provides a lot of insight into the understanding of why some uncontrolled settlements might improve through self help housing and why others might not. Most importantly, it provides more insights into the policy dimension of the problem.

CHAPTER ONE

INTRODUCTION

Contemporary Third World urbanisation has brought with it many urban problems. Perhaps, one of the most significant of these problems is that of providing adequate housing for the seemingly ever increasing population, and especially the lower income groups. In many cases housing shortages find expression in very high occupancy ratio. The apparently wide gap between the supply of and the demand for housing in most Third World cities have operated to escalate house rents.

Rosser (1972:180) observed that, housing shortage in urban areas of the Third World has now reached staggering proportions, and grows annually worse as the rate of provision of new and satisfactory housing lags behind the rate of population increases. In around 1960, the United Nations set a target of 10 houses to every 100 inhabitants. Up to 1965 only 2 new dwelling per 1000 inhabitants have been built in many Third World countries. In 1975 the quantitative housing deficit was estimated as over 1.5 million dwellings. In the mid-1970s Nigeria's housing deficit was estimated at about 1 million units.

The housing needs in most Third World cities have been made greater and housing problems exacerbated by a combination of factors including the fact that most of the traditional housing are in a delapidated condition and fall within what is often termed 'slums'. While additional housing is required to relieve existing overcrowding, natural population increase within the cities themselves demands the provision of yet more housing.

World Bank estimates for the period 1970-75 indicate that in fact the rate of rural-urban migration is generally quite significant in most Third World countries (World Bank, 1979). Thus rural-urban migration which has assumed greater proportions during the post war years has also aggravated the housing needs of Third World cities. In-migration into Rio de Janeiro, as cited by Mountjoy (1976) is in the order of 50,000 persons a week. Rural urban migration has thus, introduced yet another dimension to the urban housing problem especially those of the low income groups. In addition to these, the land upon which housing must be provided is itself problematic.

In most Third World countries, as observed by Mabogunje et al (1978) urban development programmes are formulated against a background of the concept of private and/or customary land ownership. This has created serious obstacles to the formulation of workable plans and policies. In countries where public responsibility for the supply of land have been acknowledged through land nationalisation, the continued enforcement of colonially inherited and/or imported housing and development standards has hampered the achievement of required housing units.

In response to these great shortages of development land, housing as well as high rents that have accompanied these shortages, substantial unplanned housing neighbourhoods have continued to emerge in most Third World cities. In the early 1970s, squatters make up to about 40% of the population of Caracas, 30% in Djarkata, over 40% in Lima and 25% of the population of Casablanca. In a large number of Third World countries, as observed by Mountjoy (1976) squatters probably account for at least 30% of the urban population. Hardoy and Satterwaite

(1981) in their review of seventeen Third World countries concluded that urban centres were growing faster than housing, services and infrastructure. While this situation presents a contemporary urban problem, it undoubtedly raises yet another problem, that of understanding the phenomenon and applying appropriate concepts towards solving or at least reducing the problem.

Unplanned housing districts that have accompanied contemporary Third World urbanisation have been termed 'squatter settlements', 'uncontrolled', 'spontaneous settlements' etc. In the past, the role of these subareas as a housing form has been the subject of considerable debate. The conventional wisdom of the Wirthian theory led to an interpretation of these areas as decrepit slums, lacking in basic amenities, chaotic and disorganised and should be eradicated to give way to more orderly housing development (Juppenlatz, 1970).

Over the years, such analogies have been replaced by a more euphemeral analogy in which the role of these areas as a housing form is more positively valued. Following such authors as Stokes, Mangin (1967) and especially Turner (1965, 1967, 1968) a distinction has been made between the inner city slums and the self-improving peripheral squatter settlements.

Turner's study of Lima's squatter settlement led to the view that these areas are mainly a manifestation of the desire for housing ownership by people who are well integrated in the city and have experienced some amount of social mobility. It argues that after an initial period of renting accommodation in the inner city, the more

successful migrants strive to find building land on the periphery often in unauthorised housing areas where they construct and subsequently improve their own housing over a number of years.

Consequently, it is recommended that stimulating these spontaneous activities (rather than eradication) would benefit enormously from the resourcefulness of the squatters. Legalisation of land tenure, provision of infrastructural services which are often regarded as essential in other parts of the city and the support for local neighbourhood organisations are necessary ingredients for a more healthy urban growth.

Apart from these policy guidelines, Turner (1968) also advanced a theoretical model of intra-urban mobility in which rural-urban migration, upward social mobility, intra-urban mobility and the growth of spontaneous settlements are inter-related. Within this model, migrants are classified in three successive groups namely, 'bridgeheaders', 'consolidators', and 'status seekers', to which three corresponding housing priorities - location, security of tenure and quality of housing and environment were assigned. The bridgeheaders designation relates to the newly arrived migrants who are likely to be in search for employment or in low paid jobs. The consolidators are those migrants who have had some experience of the urban way of life and are in relatively better paid jobs. While the status-seekers correspond with the upper class of the low income group.

Upward economic and social mobility from a low paid job to a better paid job, is argued reflects in a housing priority and expectation about living and housing conditions. Those who move from

a lower position to a higher position in the social hierarchy also move from the inner city slums to the suburbs. In other words, social mobility entails spatial mobility within the urban environment

AIM OF THE STUDY

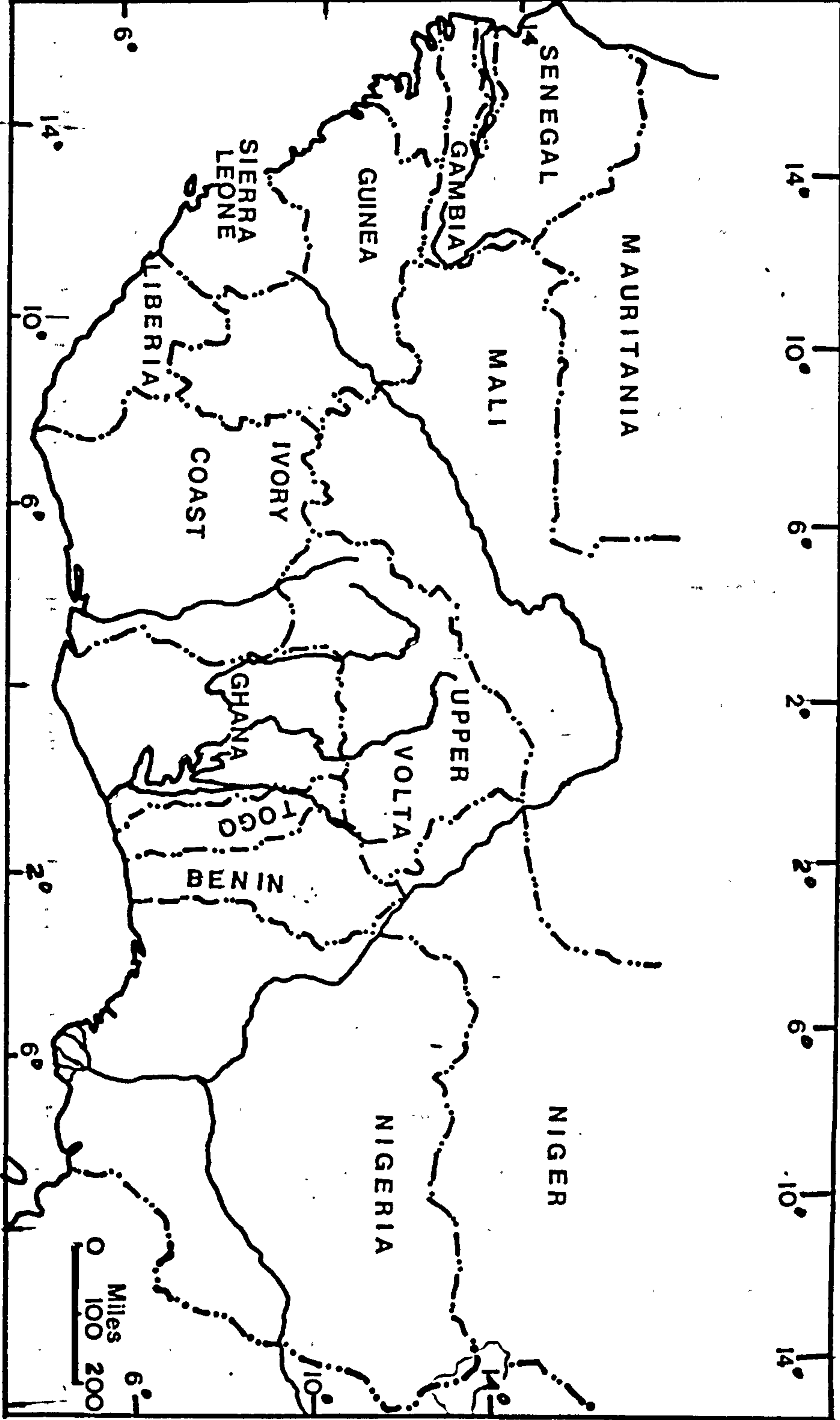
This study is an attempt to examine the above formulation within the context of a rapidly expanding Nigerian secondary city of Jos. The study intends to ask whether Turner's model (which is based largely on the migratory characteristic and experience of Latin American countries) have gone far enough in acknowledging the various dimensions of rural urban migration of the Third World countries and the varying types of uncontrolled subareas that have emerged as a result of these differences.

This research is so directed mainly because Turner's formulation have not been empirically tested or applied in the West African region let alone in a secondary city of this region.

Jos has been selected for this study, partly because most of the research that has been done on African cities are based almost exclusively on the capital cities. Yet secondary cities of the Third World generally have not only been growing rapidly in both numbers and population, but also, as noted by Rondinelli (1983), have extensive and spreading squatter and/or uncontrolled settlements and they face increasing demand for basic housing and shelter. Map 1 overleaf shows Nigeria's setting in the West African Region.

The United Nation's demographic survey cited by Rondinelli (1983) indicates that the number of secondary cities of the Third World generally more than doubled between 1950 and 1980. In Nigeria, their number has increased from five in 1950 to twenty in 1980. The population

Map: 1 MAP OF WEST AFRICA SHOWING NIGERIA'S SETTING IN THE REGION



Source: Gleave & White (1969) The West African Middle Belt

of secondary cities of Africa is estimated to have been increasing at an annual average of nearly 7% during the 1960s. This study, is therefore aimed at illuminating the problem of uncontrolled urban growth within the context of secondary cities, that is, those cities of the national urban system that are large enough to perform important economic and social functions for their population and those of the surrounding areas, but which are relatively smaller than the national capital or the largest metropolis to which a larger proportion of the benefit of economic development has previously gone.

Despite the apparent lack of research in the areas mentioned above, self-help housing policy which derives its credibility from the assumptions of Turner's intra-urban mobility model is becoming increasingly accepted as a panacea for the problems of Third World uncontrolled urban growth. Uncontrolled settlements are seen as self improving suburbs and governmental policies, it is argued, should aim toward encouraging people to build their own houses rather than the provision of formal sector housing.

Since 1970, aided self-help schemes of various types have increased dramatically. This is largely due to the financial and technical resources which the multinational organisation, such as the World Bank and the United Nations, have made available specifically for such schemes. Aided self-help projects have in effect become part of highly organised government programmes, despite their populist origins.

The proposition that uncontrolled subareas are self improving suburbs fails to recognise that while it is true that Third World

uncontrolled settlements emerged largely as a result of rapid urbanisation, significant variation which inhibits generalisation exists between Third World countries, not only in terms of migratory flows but more so in terms of the character of rural-urban migration which in turn creates variations in housing demands ^{and} housing ambition of the people involved. This also leads to variation in migrant reception areas in the city and therefore in the capacity of uncontrolled subareas to improve through self help housing construction.

In most of West Africa and parts of south-east Asia, unlike most of Latin America, rural urban migration has been reported to assume a predominantly temporary character (Breeze, 1966; Peil, 1976; Gugler, 1979). Varying migratory characteristics in terms of whether the migrants regard their stay in the city as permanent or temporary could lead to differentiation in housing demands and housing priorities in the city of migration. Peil (1976) and Sofier (1973) observed that temporary migrants prefer the flexibility of cheap rented accommodation while in the city. Their housing priority is to build a house in their rural hometowns where they intend to return eventually.

Obviously, these differences in housing demands and priorities are likely to influence migrant reception nodes in the city. Yet the intra-urban mobility model assumes that the city centre is the main port of entry of newly arrived migrants. The reception nodes would also reflect not only the migratory patterns but also the characteristics of the incoming individuals and groups. The areas are therefore very likely to be affected by the characteristics of the incoming groups.

Given that in most parts of West Africa migratory patterns tend to be predominantly temporary in character, it is unlikely that security of tenure would rank high in their order of priorities as supposed by the intra-urban mobility model. Neither is social mobility likely to lead to spatial mobility.

In most parts of West Africa, rural urban migration is structured by kinship relationships. Migrants in this region move largely to cities where they expect to be received by friends and relatives who provide them with initial accommodation. Indeed, as Harrison (1967) rightly observed, migrants from the countryside generally move directly into uncontrolled settlements, often to join other relatives, and partly because the inner cities are already overcrowded. Mcgee (1967) also observed in South East Asia similar patterns in which newly arrived migrants move into squatter settlements.

Within the context of predominantly temporary migration and kinship relationships, it is very unlikely that Turner's bridgeheader-consolidator dichotomy will apply. Bridgeheaders it seems, are more likely to remain bridgeheaders since they do not strive to become consolidators. The distinction between permanent and temporary migration appears to have more validity and general application not only within the context of temporary migration but within the Third World situation.

Apart from varying migratory patterns, fundamental differences which have implications for the intra-urban mobility model and the growth of uncontrolled subareas exists between Third World countries. Differences in land tenure systems, arrangements for access to land

for uncontrolled developments, the recency of colonial presence and the impact which this has upon planning standards and settlement patterns, all reduce our ability to generalise about the nature and the development of physical characteristics in uncontrolled subareas.

Varying land tenure systems and experience of migrants for example, have led to varying arrangements for access to land for uncontrolled developments. This has also led to heterogeneity of housing types within uncontrolled settlements. Yet it is not questioned whether the varying housing and settlement types reflect any differences in ambitions. It is however assumed that all migrants strive to consolidate their stay in the city.

Adopting the proposed distinction between permanent and temporary migrants has more practical application than the bridgeheader - consolidator dichotomy because it provides a lot of insight into the various ways in which migrant groups perceive the city environment and how their perception of the city in turn affects the development process of their settlement areas. This, distinction also provides a lot of insight into understanding why some uncontrolled subareas might improve through self help housing and why others might not. Most importantly perhaps, it provides a lot of insight into the appropriate policy dimensions of the problem.

However, in order to fully gauge the effect of varying migratory patterns and thus migrant perception of their settlement areas, meaningful spatial expression of these migratory patterns must be established including those elements in the urban environment that might constrain

11.

or evoke the greatest response in terms of decision to settle within particular areas.

SCOPE AND EXTENT OF THE STUDY

In a study such as this, the definition of terms used is naturally an important factor in determining the scope of materials and areas included. The term 'Third World' has been used in this study despite its limitations, as a general framework. This is basically because it incorporates most of the elements of underdevelopment which is an essential and common factor in the problem of countries experiencing rapid urban growth and the growth of uncontrolled subareas.

The nature of uncontrolled urban development that has accompanied Third World urbanisation has to be defined if the problem it creates is to be fully understood and appropriate policies prescribed. Unfortunately, there seems to be no simple definition of the situation.

Drakakis-Smith (1981: 1976: 297) suggests that the most acceptable definition rests on the illegality of occupation of land, house or both. Leeds (1969:44) indicates that the 'only uniform identifying characteristics are their illegal and unordered origins' by accretive or organised invasion and, because of their origin, their continued ambiguous status as settlements. Similarly, Turner's use of the term 'Squatter Settlements' would have similar legal implications.

However, these definitions apparently include the frequent cases where land for uncontrolled developments are purchased, rented or leased.

Although these arrangements for access to land follows legal procedures, such lands often lack planning permission from the authority, due to inadequate infrastructural services and sometimes because they are located outside the city boundaries.

Any definition must include the common practice in West Africa and south-east Asia where permission is obtained from Custodians of Customarily owned lands (Peil, 1976). It must also include the situation where both the poor and the relatively rich share the illegal status in uncontrolled subareas.

A common definition of uncontrolled subareas is that they are self help housing (Turner, 1968). Although it might be true that self-help has been an essential part of the growth process of some uncontrolled subareas, the use of the term is inadequate without qualification.

Obviously, neither self help or illegality of occupation is an adequate definition of uncontrolled subareas. Neither does income provide an adequate definition. Consequently, the term 'Uncontrolled Settlement' has been adopted in this study because it includes most of the essential elements common to all such areas (uncontrolled urban development) which urban development strategies aim to redress.

Within this defined context it is possible to identify the various types of Third World uncontrolled settlements including:-

1. Settlements in which the dwellings are built by the households which originally occupied or now occupy it.

2. Settlements which from their inception suffer from both illegality and lack of planning permission.
3. Settlements which follow some legal procedures but suffer from lack of planning permission.
4. Settlements which are largely built for rented purposes.

Within these broadly defined types of settlements the following sub types may be distinguished.

- (a) Settlements that emerged through invasion of public or private land in an organised or incremental manner.
- (b) Settlements in which the purchase of land is involved.
- (c) Settlements on rented or leased land.
- (d) Settlements on customarily held land in which permission has been obtained,

It should be noted that the types and subtypes of settlements given above are by no means comprehensive. In certain cases the subtypes given above overlap, even in the same settlement. This is therefore only an indication of the complexity of the nature of uncontrolled settlements.

However, implied in the temporary-permanent migrant dichotomy proposed earlier, is the assumption that specific types of settlements grow under certain migratory characteristics.

SECONDARY CITIES

Although the term secondary cities emerged from a variety of theoretical and practical arguments about their potential role in regional and national development, there is not as yet a universally accepted definition of what constitutes a secondary city. Some analysts define secondary cities as those cities that perform central place functions, that is, their economic and social activities and thus the cities themselves must serve people living outside their boundaries. Others argue that the function of secondary cities must be interactive, should connect, transfer and disseminate and should serve as channels for the flow of goods and services, mediate social relationship and diffuse modernisation influences.

Rondinelli (1983) on his part argues that since there is a strong relationship between population size and the variety of functions found in cities, then population at least provides a starting point for identifying secondary cities. He recommended a threshold of 100,000 population; as long as they are smaller than the capital city. Highlighting some of their characteristics, he observed that secondary cities are typically regional service and administrative centres located in rural regions, and are only rarely predominantly manufacturing towns. The dominant economic sector tends to be wholesale and retail trade, small scale business and personal services, catering for both the urban population itself and the rural hinterland. The characteristics of secondary cities as defined above seems to correspond with the role of some of the state capitals of Nigeria of which Jos, is one.

The state capitals of Nigeria have been growing rapidly in population size, although relative to the largest city (Lagos) they have been growing more slowly. They have played a relatively weak role in absorbing population increases and in creating a more balanced spatial distribution of population. From the above definitions, it would seem that the range of cities that constitute the secondary dimension in an urban hierarchy must vary between countries, depending on the pattern of urban settlement, level of development and economic structure.

The term secondary city as used in this study refers to those cities of the national urban system that are large enough to perform important economic and social functions for their own population and those in the surrounding areas; but that are smaller than the largest metropolis to which most of the benefit of economic development had previously gone as the national capital. In Nigeria only the state capitals and a few other centres can be said to be within this category of centres.

On the factors that stimulated the growth of most secondary cities, Rondinelli (1983) observed that amongst the most important were their favourable physical location and endowment of natural resources, their selection as political or administrative centres, the concentration in them of colonial and foreign investments, and service centres for their regions, the influence of transportation routes and technology and the impact of government investment in infrastructural facilities. As will be discussed later in Chapter Three, most of the factors listed above are responsible for the growth of Jos as a contemporary secondary city in Nigeria.

DATA SOURCE AND METHODOLOGY

The main data sources for this study includes published documents, Government reports, township maps and a number of development plans proposed for the city and its region. In addition to these sources, an extensive household survey of the study areas was carried out by the author between January 1983 and May of the same year. A sample of about 394 households were interviewed in five study areas.

The survey provided the necessary information for testing some of the assumptions of the intra-urban mobility model and for distinguishing between permanent and temporary migrants. Information regarding household characteristics, migratory and residential history, housing needs and ambitions were obtained. The household survey also established the reasons for migration, reasons for settling in an uncontrolled sub area, places of origin and places of retirement.

The sample size drawn from each of the study areas was determined by the total number of houses and compounds within the areas. This method was preferred because of the apparent inadequacies of conventional means of drawing samples (e.g. Election register, Census register, telephone directory etc.) to provide the relevant coverage of the study population.

Obviously, the approach adopted here assumes an occupancy rate of one household per house or compound. This may be an over assumption given the high densities within the areas and the extensive sharing of accommodation. Nevertheless, significant bias is excluded from the sample when compared to what might have been obtained from election

register, or telephone directory. The census register could not have been appropriate because the last census in Nigeria took place in 1963.

Primary coding of the survey data entailed checking to ensure that every categorical question had a coded response. Those questions which were open ended e.g. place of birth, place of origin had frequency list compiled from which the principal alternatives were coded. A copy of the questionnaire can be found in Appendix 1.

STRUCTURE OF THE STUDY

The study is structured under ten chapters, one of which is the introduction (Chapter One), Chapter Two examines the phenomenon 'Third World uncontrolled settlements' within the context of Turner's intra-urban mobility model. This involves a review of the literature (on the subject) which showed that Third World uncontrolled subareas vary a great deal not only between regions but also within areas of the same region. Most of the variation, it seems, can be attributed to varying migratory patterns, varying land tenure systems and varying arrangements for access to land for uncontrolled development. These variations, if anything, indicate the limited application of the intra-urban mobility model as well as the need to be more flexible and specific when analysing the phenomenon uncontrolled development.

Chapter Three provides the physical setting of the study area, Jos, the social, economic and cultural background of the city as well as the historical analysis of the development of uncontrolled settlements in the city. The analysis shows that a number of factors are responsible for the growth of uncontrolled settlements in Jos, including the shortage

of officially provided development land created largely by the continued existence of unexpired mining leases in and around the city and the developmental practices which has adopted high standard housing and servicing development land. Faced with these problems, the proliferation of mining camps has encouraged the growth of uncontrolled development in the city.

Three analytical techniques have been employed in the analysis of the survey data namely, Chi-square tests, Log-linear modelling and Association Analysis. However, as a prelude to the above mentioned analyses, a frequency distribution of responses (i.e. descriptive analysis) has been undertaken in terms of migrant port of entry to the city, the role of kinship relationships in migrant settlement process, the role of cheap rental accommodation in the settlement process and the role of employment and employment opportunities.

The above analysis and the results form the subject of the fourth chapter of the study. The results indicated that contrary to the assumption of the intra-urban mobility model (which suggest that the inner city is the entry point of newly arrived migrants), Jos uncontrolled subareas appeared to be the main reception areas of newly arrived migrants. A number of reasons accounted for this, including; the dependence on friends and relatives who are themselves resident in the uncontrolled settlement for initial accommodation in the city, (which has led to ethnic concentration in almost all the study areas), the need for cheap rental accommodation as well as the need to be within close proximity of income earning areas.

Chapter Five presents the results of the analysis of the survey data in terms of which part of the bridgeheader population becomes consolidators. The chi-square test was used to determine association between respondents intended length of stay in the city and propensity to consolidate in the settlement of migration.

The results of the analysis indicate that the propensity to consolidate in the city of migration is closely associated with those migrants who intend a permanent stay in the city. Temporary migrants on the other hand, are more inclined towards consolidating their position in their rural hometowns. Thus not all the bridgeheader population strive to consolidate in the city.

Chapter Six examines the dependency relationship between plot ownership in the city (i.e. propensity to consolidate) type of migration and respondents area of residence in the city, using the Log-linear model. The results of the analysis revealed a pairwise association between plot ownership in the city, intended length of stay in the city and area of residence.

The pairwise association implies that there is a relationship between every pair of variables but that the association is independent of the categories of the third variable. In other words, there is association between plot ownership in the city and intended permanent stay in the city but the association is independent of the areal dimension.

Chapter Seven examines the dependency relationship between plot ownership in the rural hometown, type of migration and area of residence

in the city. The result of this analysis revealed a saturated model association between the three variables, implying that all the variables are interrelated. In other words, there is association between any pair of variables but the association is dependent on the areal categories of the third variables.

In spatial terms the results of the log-linear analysis presented in Chapters Six and Seven imply that there is variation between the areas in their propensity to improve through self help housing. The pairwise association between plot ownership in the city, permanent migration and area of residence in the city indicates that improvements within each of the areas is dependent on the proportion of permanent migrants in the area. While the saturated model of Chapter Seven indicates that temporary migrants tend to concentrate in certain areas. Therefore the areas cannot be regarded as similar in their capacity to improve through self help housing.

Following from the above pattern of association, the study goes on to attempt an identification of these areas where the relationship between plot ownership in the hometown and intended retirement is significant (i.e. areas less likely to improve). Two areas namely, Tudun Wada, and Dadin Kowa were identified in this category. However analysis of the areas in terms of which one had the strongest association between plot ownership in the city and permanent migration showed that Kabong area and again Dadin Kowa area were in this category. Thus Dadin Kowa appears to have both attributes of self improvement and non self improvement.

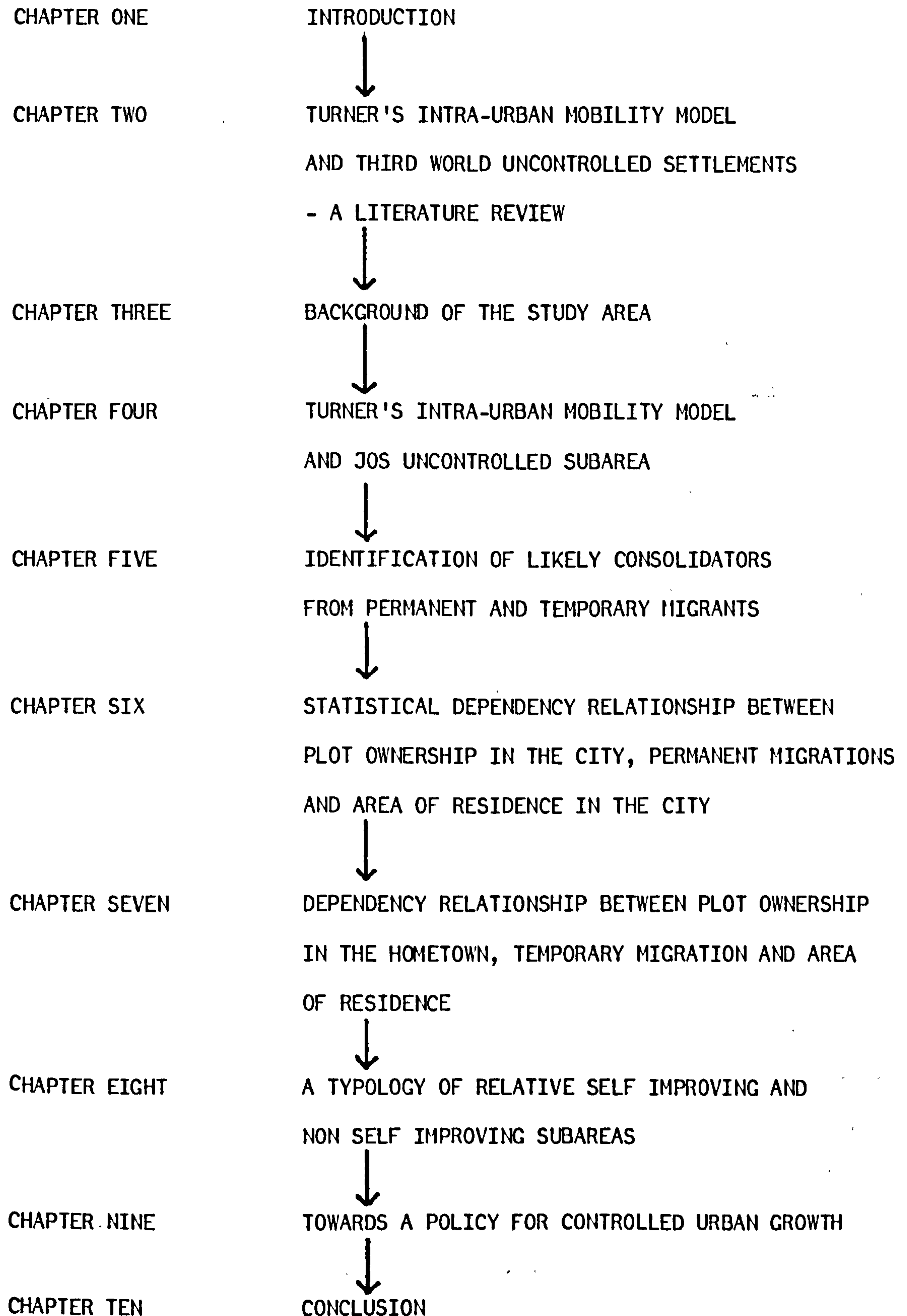
The three areas identified in the above analysis, i.e. Kabong, Dadin Kowa and Tudun Wada, correspond with the reception modes of short distance, medium distance and long distance migrants respectively indicating that short distance migrants are more likely to consolidate their stay in the city than medium or long distance migrants. It also indicates that medium distance migrants are more likely to consolidate in the city than long distance migrants.

Following from the patterns of association observed in the preceding analyses, a typology of relatively self improving and non self improving subareas is advanced in Chapter Eight. The typology is based on the proportional distribution of migrants groups between the areas. Such a typology provides useful insights into the nature of the policies that might be adopted for each area. The implications of this typology for self help housing policy is also examined in this chapter. Association Analysis (a classification procedure) has been employed for the purposes of identifying those improvement attributes and the subsequent typology.

Chapter Nine provides a broad guideline for the formulation of appropriate policies in view of the varied nature of Third World uncontrolled subareas. While Chapter Ten provides the conclusions of the research. Figure One overleaf provides a diagrammatic structure of the study.

FIGURE 1

STRUCTURE OF THE STUDY



CHAPTER TWO

TURNERS MODEL OF INTRA-URBAN MOBILITY AND THE PHENOMENON UNCONTROLLED SETTLEMENTS

Since the 1960's, studies of Third World urbanisation have centred on the growth of uncontrolled urban settlements that have accompanied urban growth. These settlements which often grow under ambiguous legal status go under various names.

In Brazil, they are called 'Favelas' in Venezuela, 'Rancho' or 'Barrios,' in Turkey 'Gecekondu,' in India 'Bustee,' etc. Their relative importance as a housing form is on the increase as they continue to house a large proportion of the population of most Third World cities.

In the past the role of these subareas as a housing form has been the subject of debate. The conventional wisdom of Wirthian theory led to an interpretation of such settlement, as decrepit slums, lacking in basic amenities, chaotic and disorganised. Jupenlatz (1970) described these settlements as spreading 'Malady', Fungus or Plague of excessive filth and poverty, inhabited by ruralites who arrive in ever increasing numbers and construct houses according to rural technology, gives credence to demand for their eradication and replacement by public sector housing.

Over the years these superficial and derogatory characteristics have gradually disappeared from the literature. The illegal land invasions and self-help construction of houses by the low-income group are now more positively valued. Turner (1965,1967,1968) and Mangin (1968) in their studies, perhaps more than any other, have in many ways helped in reversing the conventionally held views about uncontrolled subareas.

They have helped in drawing the attention of planners, Administrators and International Aid foundations, such as the 'World Bank' and the 'United Nations', to the problem of uncontrolled settlements of the Third World cities with the view to improving and integrating (rather than eradicate) uncontrolled settlements into the urban system.

Turner (1968 p.358) in a study of the comparative usefulness of the self-built homes in these areas of Latin America and what he called the 'instant development' procedure, (i.e. officially provided housing) argues that much of what appears as conventional wisdom regarding urban housing problems in the developing country is inappropriate to the real world situation because of the conceptual confusion between what he regarded as 'the Architecture of Moulds' and 'the Architecture of systems'. The building forms of the 'Bariadas' he argues, are based on a system, they are therefore flexible and respond to changing needs and demands.

Turner argues that uncontrolled settlements are mainly a manifestation of the desires for house ownership by people who are well-integrated into the city and have experienced some amount of social mobility. Turner (1968) subsequently formulated a behaviouristic model of migrants which implies that following an initial period of residence in the inner city, the more successful migrants try to find building plots in the uncontrolled settlements where they construct and subsequently improve their own houses as income increases.

Apart from this behaviouristic model, Turner also advanced some practical planning guidelines, arguing that Planners and Authorities should stimulate these spontaneous activities than follow restrictive policies. Security of land tenure, the provision of essential infrastructural amenities, and the creation and support for local community development groups, are some of the essential elements of controlled urban development.

In addition, Turner (1968) also designed a theoretical model of intra-urban mobility in which rural-urban migration, upward social mobility, intra-urban mobility and the growth of uncontrolled settlements are inter related.

TURNER'S HOUSING PRIORITY MODEL

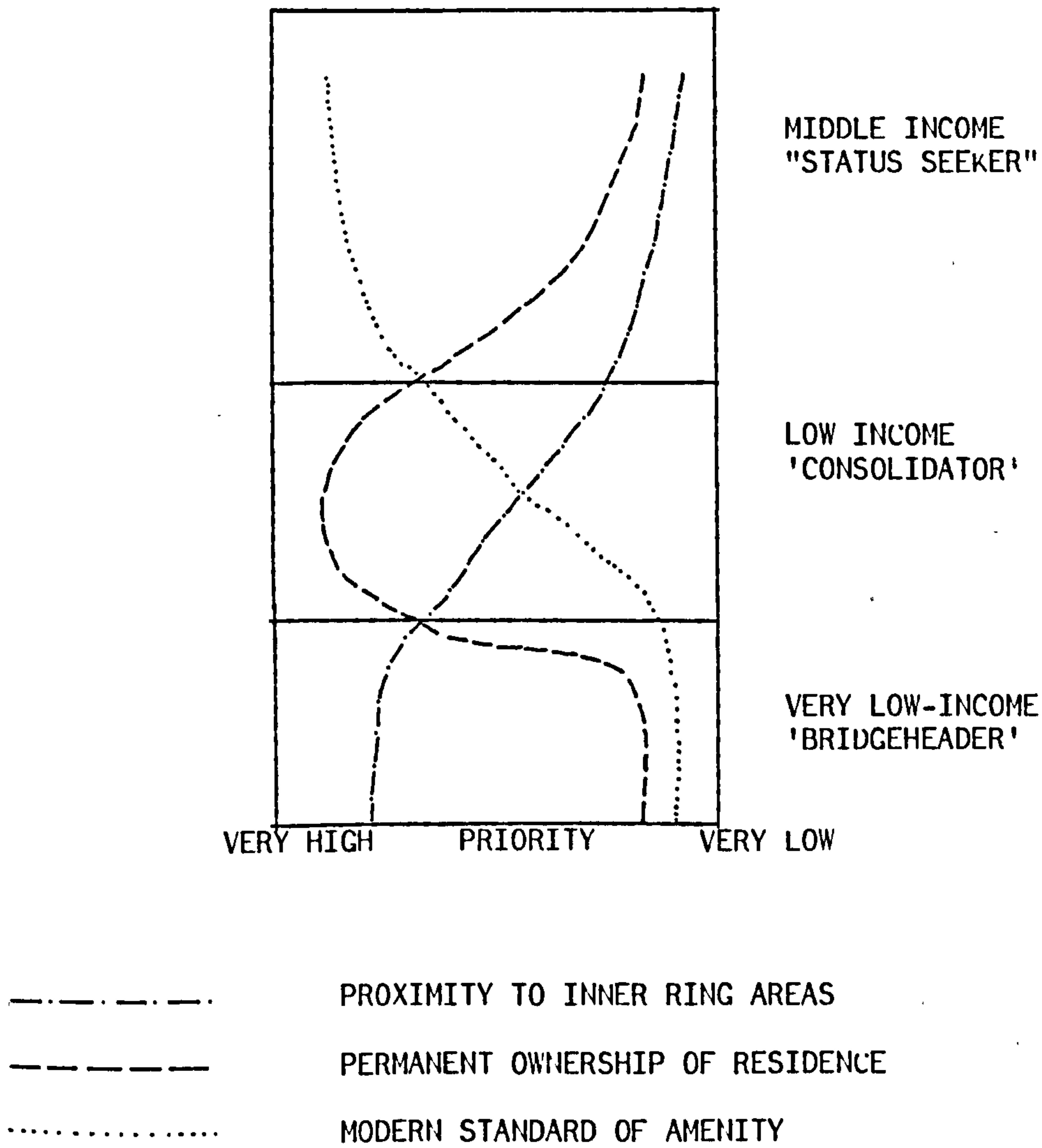
Basing his approach on the assumption that the market value of a house built by the inhabitants of uncontrolled settlement is of relatively less importance than its use to the occupier, Turner (1967) classified such housing according to their use value as expressed essentially in terms of tenure, location and amenity, arguing that the individual household would assess their economic and social status and will move to an area (or settlement) which is in line with their priorities or would remain in a settlement that is changing in line with their priorities.

Turner related these housing priorities to three categories of urban low-income migrants, namely; the bridgeheaders, the consolidators and the status seekers, which supposedly corresponds with successive stages in the migrants' economic growth. Within this model, a shift from a low paid job to a better paid job is seen as reflecting a change in priorities and expectations about living and housing conditions. (See figure 2 overleaf).

In Turner's terminology, the 'bridgeheader' is the recently arrived migrant from the countryside who is likely to be seeking entry to the urban system. Location in the inner city or through illegal building is seen as the first priority for this category of migrants. The city centre is regarded here as the main source of employment for bridgeheaders.

FIGURE 2

INCOME LEVELS AND RESIDENTIAL PRIORITIES (TURNERS)



Source: J.C. TURNER (1968) 'Housing Priorities, Settlement Patterns,
and Urban Development in Modernising Countries'
Journal of American Institute of Planners
P.358

A 'Consolidator' is one who has already gained some amount of foothold in the city and whose expectations are rising especially in relation to his socio-economic status and dwelling environment. Security of tenure is regarded here as the first priority of this category of migrants. The uncertain situation as a tenant or illegal developer prevents the migrant from obtaining a firm footing in the urban scene. While income may be low or insufficient to meet or buy a house in the middle class residential areas, it is adequate to purchase or build illegally in uncontrolled settlements.

Although squatting entails the risks of eviction, it also provides a chance of housing ownership if and when the authorities grant him title. The greater the chance of granting the title, it is argued, the more the consolidators will be inclined to improve their houses. Security of tenure and improvement of the quality of housing and indeed the housing environment are regarded as functionally related.

The 'Status Seeker' are the upper echelon of the low income group or the lower middle class. They attach great value to the quality of their houses and to the status and amenities of their housing environment. Turner did not elaborate on the patterns of intra-urban mobility of the status seekers.

TURNER'S ECOLOGICAL MODEL

Turner (1968) also advanced a structural urban ecological model, in which he classified the growth of Latin American cities into three successive stages, each of which corresponds with a particular level of economic development and a certain ratio, between natural population increase and in-migration. Ecological process such as 'Filtering',

'Invasion' and 'Succession' are perceived within this model as resulting in specific land use patterns.

The three stages are; The Early Transitional Stage, The Mid-Transitional Stage, and the Late Transitional Stage.

The Early Transitional Stage - Both population size and the built up areas are small. While population increase is generally slow, natural increase is quantitatively more important than in-migration. Residential land use patterns comprise of two elements, the inner city and the suburbs.

'Suburbanisation' is the main form of intra-urban mobility. Uncontrolled development or squatter settlements have not yet emerged. The population increase is small enough to be absorbed by formal housing.

The Mid-Transitional Stage - This is the stage at which rural urban migration to the city is at its peak, and is quantitatively much more than natural increase. Residential land use patterns at this stage consist of three main elements; inner city slums, high income suburbs and the outer ring of squatter settlements.

The city centre has reached a stage of decay and is now almost completely occupied by low-income households. The city centre is hence the main port of reception of newly arrived migrants - the bridgeheaders. Socially more successful consolidators move to the peripheral squatter settlements. With further growth in the size of the built up areas, these squatter settlements which were on the outskirts change into inner ring settlements.

The Late Transitional Stage - The city's growth at this stage is characterised by relative stability. Population increase^{is} levelling off and more evenly divided between natural increase and in-migration, central area slums have been cleared for commercial renewal and the inner ring squatter settlements are up-graded and fully integrated into the urban system. New migrants move to inner ring and subsequently to the low density outer ring. At this stage, the standard of life of the low-income groups has improved and as well as the quality of their houses.

These models which are based almost entirely on the migratory experience and the development processes of Latin-American countries (in the face of inadequate research in other parts of the Third World especially West Africa) led to the generalisation that Third World uncontrolled settlements are self improving suburbs. Consequently, self-help housing policy is increasingly becoming the panacea for Third world low-income housing problems.

Yet, heterogeneity of housing form and migratory patterns are known to exist not only between regions but sometimes within countries and settlements of the same country. Not all uncontrolled subareas develop the same positive features of organisation and potentials for self-improvement as those described by Turner and Margin. This was especially the case in the Caribbean (Clerk and Ward, 1978, Rogler, 1967) or in West Africa (Peil, 1976, Sofier, 1973), though certain authors have argued otherwise. (Eyre, 1972, Hanson 1975).

However, while this reassessment of the role of uncontrolled settlement as a housing form is welcomed, it is necessary to examine more closely some of the assumptions upon which Turner's models are based and clarify the extent to which they are applicable to the general Third World

situation or the extent to which Turner's perception of the 'ideal' uncontrolled settlement dominated largely by 'Consolidators' may be representative of the general Third World perspective and moreso, in West Africa.

ASSUMPTIONS OF TURNER'S MODEL

Implicit in Turner's formulation are some of the following assumptions.

Firstly, it assumes that the city centre is the reception mode of newly arrived migrants or bridgeheaders, yet ample evidence exists in the literature which suggests that the city centres are diminishing in their capacity to take in more people.

Secondly, it ignores almost entirely the role of kinship relationships in structuring the migration process and in the integration of newly arrived migrants as well as the effects of such migratory patterns on migrant adjustment to city life. Yet, migratory patterns in some parts of the Third World, especially West Africa, are known to be structured by extended family and assume a temporary character.

Thirdly, it assumes that, as economic security is achieved values are revaluated reflecting a housing preference supposing in effect that all migrants who experience social mobility would react in a similar fashion. Yet the evidence in the literature would seem to suggest that inhabitants of uncontrolled sub-areas are a large and disparate array of social types both before and after immigration. Moreso, the necessity of settling in an uncontrolled settlement occurs in quite different circumstances in the city or at different stages in the life of the same family.

Fourthly, it assumes a considerable amount of intra-urban mobility from the city centre to the peripheral uncontrolled settlements. Yet bridgeheaders in some parts of the Third World move from their rural hometown straight to urban uncontrolled settlements due to the diminishing role of the city centre to absorb more people.

Fifthly, the emphasis of the model is on income or economic variables yet as Dywer (1975) rightly noted, only to some extent can improvement activities be related to household income.

However, this study hypothesises that fundamental differences between areas of the Third World in terms of the local structure of the land tenure system, migratory patterns, life style and in some cases the recency of colonial presence and the impact which this has on planning standards and settlement patterns makes it difficult to generalise regarding the behaviour of the inhabitants and the development process of uncontrolled sub areas.

Variations in land tenure systems between and within Third World countries makes the land invasion of the Latin American countries uncharacteristic of the general Third World situation. Indeed varying arrangements for access to land for uncontrolled developments have emerged in response to the varying land tenure systems leading in effect to varying types of uncontrolled settlements.

Variations in migratory patterns in which some assume a temporary character makes it difficult to transfer without modification Turner's Bridgeheader Consolidator dichotomy. Thus where migratory pattern still bear a temporary character, the bridgeheader population are not likely to become consolidators.

The role of kinship relationships in such migratory processes, in which relatives provide initial free accommodation and assistance in securing jobs indicates that migration in such areas is not a spontaneous exercise. Migrants do not, therefore, move straight to the inner city residential areas.

Moreso, the impact of colonial presence in which traditional land-use patterns were maintained in some inner city areas has led to high densities within the city centre. The recent clearances of inner city slums and the decentralisation of industrial activities to more accessible peripheral areas of the city have all served in varying ways to make the inner city areas less attractive to newly arrived migrants.

Thus the relationship between upward social mobility and spatial relocation may not necessarily occur.

While Turner's model has been generalised to cover the Third World, it failed to acknowledge that the political, economic and cultural context of Latin America, Africa and Asia are quite different. These differences are more acute when focused on land issues and even more acute when focused on the arrangements for access to land for uncontrolled development which are bound in the specific migratory, cultural and historical conditions of every country in a region.

Studies have shown that within uncontrolled settlements varying land arrangements exists not only between regions but sometimes within the same region, each of which has its own implication for the future growth of the settlement. As Dwyer (1975) rightly observed, the lengthy organised land invasion of Lima's squatters is not typical of the Third World situation because in some countries there are no publicly owned lands which prospective squatters may appropriate with a view to gaining title.

Peil (1976) observed that in most of West Africa, the presence of the customary land tenure system inhibits squatting at the scale experienced in Latin American countries. Nevertheless, uncontrolled settlements do exist but such developers often obtain permission from local leaders to settle on such land. Similarly, Wegelin and Chanond (1983) noted that in Bangkok, uncontrolled settlements consist largely of short term leased rentals of small plots of land on which families build temporary houses. Lea (1983) also observed the sub division of customary land surrounding Port Morsby, Papua New Guinea, on a quasi-rental, without any guarantee of formal documentation.

Clearly, therefore, a distinction has to be drawn between the highly organised and incremental invasion of land. Such a distinction is necessary since the form it takes is indicative of the level of commitment of the people involved as well as the political will to pursue those commitments. A distinction should also be made between settlements that emerged on land without the prior consent of the land owner (squatting) and one in which permission is obtained prior to occupation; but which government has not granted permission for development. Sofier (1973: 17-18) suggested the use of the term 'Uncontrolled Settlement' or 'Quasi-Squatter Settlement' as a more accurate designation of the situation as it occurs in Africa. These distinctions are necessary because each has its own implication for the growth and future development of the area concerned. Turner (1968) emphasised the importance of security of tenure in the development of these areas. But who or what ensures security? In situations where the land is bought, the security generally follows even where planning permission is lacking. Where the land is rented as noted above, the security depends on length of the lease and upon being able to maintain rental payments. Where there is no security, houses are designed so that they can be moved easily to another location (Gilbert et al 1983, Eyre 1972: 406).

Clearly, therefore, the land dimension upon which uncontrolled settlement grows requires a more precise and detailed understanding of the nature of the arrangements in particular areas. In some cases they involve a variety of sophisticated transactions which are sometimes not easy to understand.

For example, Roy (1983) provides a comprehensive typology of land supply arrangements for housing the poor in Calcutta. The three most important arrangements are the 'Thika' tenant system, the legalised refugee colonies and the squatter settlements.

The 'Thika' system is a three-tiered tenant system whereby the land owners rent the land to the Thika tenants who then construct huts for rent to the poor families. Roy (1983) also observed that while squatter settlements on government lands are being able to be improved through the provision of services and security of tenure etc., the 'Thika' tenant system has constituted a serious problem to the development of these areas.

This rather brief review shows quite clearly that the arrangement for access to land are specific and they vary from place to place. This is to be expected since people or migrants in the urban scene will deal with land matters on the level of their understanding, whatever that may be.

Turner's emphasis on security of tenure assumes not only that the settlements are all illegal but also that they are all on publicly owned land. Where such settlements are on private land as Dwyer (1975) rightly noted, a significant change in attitude on the part of the land owning elite would be required. This does not, however, imply that where the settlements are on government land the question of security is less problematic

Obviously, with effective political pressure, security can be obtained. But if the governments change (as they always do in the Third World countries) or its political power weakens, the settlements may be threatened.

MIGRATORY PATTERNS AND SOCIAL MOBILITY

Apart from the general flow of migration, there are two distinct components of significance to the formation of uncontrolled sub areas and indeed the question of social mobility involved. These components are the permanent and temporary character of migratory flows, each of which has its own implications.

While implicit in Turner's model is the assumption that the typical rural-urban migrant considers the city of migration as his ultimate destination, studies from other parts of the Third World, especially Africa shows that rural-urban migration is a lot more complex than assumed by Turner's model. In most of Africa, rural-urban migration, assumes a predominantly temporary character. (Mitchell, 1956; Banton, 1957; Pon, 1969; Gugler, 1970). Yet even within this predominantly temporary context of migration, significant variation has been observed between West and East Africa.

Mitchell, (1961) observed that in East African countries, rural-urban migration tends to involve much longer absence from home. However, in West Africa, even climatic changes have been shown to have significant influence upon migratory flows and duration of absence from home. Whereby a usual cycle of migration from rural areas in the dry season to the towns when work on the farm has finished and a move back to the rural areas at the beginning of the rains in the following year. (Hodder (1957), Gugler (1979)). Zelinsky (1971) and Gould et al (1972) have suggested that the

dominance of climatic seasons in regulating the movement of population makes 'Seasonal labour circulation' an appropriate term for some West African migration.

This is not to imply that trends towards longer periods of migration has not been observed in West African countries. Indeed, migration of complete households has gained importance, as reflected in the levelling off of sex ratios in urban areas (Knoop, 1971 p.19-29). This, however, goes to show only too well the complexity of migratory dimension of the growth processes of uncontrolled sub areas.

These migratory patterns differ significantly from those known to exist in Latin American countries. Herrick's (1965) survey of immigration to Santiago (Chile) shows that a high proportion of the migrant moves tend to terminate in the city of destination, and although migrants often visit their villages, little permanent return migration has been reported. In contrast, research in various parts of Africa shows that rural urban migrants regard their stay in the city as temporary. Yet there appears to be variations between areas.

For example, Pfefferman (1968:P 45) found in ^{his} interviews with industrial workers in Dakar, Senegal, that 75% of those respondents who were born in rural areas intend to go back when they retire. Similarly, Mitchell (1956 p.208) found in Zambia, that the proportion of copper miners who intend a permanent stay in the city, ranges between 7 and 13%. Stren (1972: 111) reports that only 35% of the migrants he interviewed in low-income areas of Mombasa, Kenya, thought of the city as home. (See also Gugler 1970: P.27).

Although certain studies such as Pon (1969 p.50), Banton, (1957, p.133-144) and Bujra (1973 p.45) suggest that more of the respondents

intend a permanent stay in the city. Peil (1976) observed that in West Africa generally, the range of permanent migration is even narrower than some of the proportions suggested above and that permanent residents are a smaller proportion of the urban population in Ghana and Nigeria than in Freetown or Dakar.

In India and parts of Asia, migratory patterns similar to those obtained in Africa have been reported. Dwyer (1975) cited a number of studies in which the evidence suggests migratory patterns similar to those of Africa. Most urban workers consider their stay in town as temporary, even after twenty or more years of residence and working in town. (Eames 1967, 1968, Zachariah 1966).

Given the above variation in migrants intended length of stay in the city, significant variation in housing demand can be expected within the city of migration. Indeed Sofier (1973) and Peil (1976) noted that the rather weak commitment of migrants to the urban way of life leads to specific housing arrangements in the city. 'Temporary migrants do not want a house in town, they prefer the flexibility of cheap rental accommodation.' They do not invest their savings in urban housing as they prefer to buy land in order to consolidate their position in the rural home-town. (Kliest et al 1981).

Caldwell (1969) reports that only 4% of his sample had no hope for rural house ownership. While 31% either owned or are building a house in their rural home area. Similarly, Muench (1972 p.24) noted that there seems little point in going to considerable extent to acquire a house in the city when return journey to the hometown may be made in a few years time.

Plotnicov (1965, 1967) observed similar patterns in Jos in which a majority of the migrants to the city nurse the desire for house ownership and for retiring in the rural hometown, but concluded that many of the migrants will fail to realise their ideals because^{of} what he terms the difficulties of adjusting to 'uncivilised' ways of the villages.

This synoptic review of the migratory patterns would seem to suggest that the migratory aspects of the growth of uncontrolled sub areas, is a lot more complex than supposed by the intra-urban mobility model. The question of social mobility and the effects which this might have on the growth of uncontrolled settlements can only be assessed within the specific migration pattern that give rise to individual settlements. Where rural-urban migration take the temporary dimension, migrants are not likely to strive to consolidate. Security of tenure is not likely to rank high in their order of priorities. Upward socio-economic mobility is not likely to have a significant impact on the areas of settlement.

This implies quite clearly, that Turner's bridgeheader-consolidator dichotomy is not directly applicable in areas of predominantly temporary migration, without modification. The temporary nature of migration in some areas implies that the bridgeheader population are likely to remain bridgeheaders, while in the city, and might never become consolidators since they do not aspire to own houses in the settlement of migration.

THE ROLE OF THE CITY CENTRE AS THE RECEPTION NODE

Implicit in Turner's formulation is the assumption that the newly arrived migrants gravitate in the city centre housing neighbourhoods. This appears to be the case in Latin American migration and settlement pattern, as confirmed by Mangin (1967) Morse (1971: P23) and Ward (1976).

The preplanned and highly organised invasion of land by squatters, Mangin (1963) and Turner (1967) implies, and indeed correlates with this fact. Those involved have a reasonable amount of urban experience and are aware of the precaution which must be taken. Abu-Lughood (1961) also observed that in Cairo, Egypt, newly arrived migrants move straight to inner city housing areas.

Turner subsequently translated the invasion and subsequent settlement in the peripheral uncontrolled sub areas as indicative of upward social mobility. Intra-urban mobility as noted by Kliet et al (1981) is not necessarily a sign of upward social mobility since such movements could be initiated by slum clearance and rehousing schemes.

In contrast to Latin American migrant settlement pattern, migrants to most of West African cities usually move to unauthorised peripheral settlements, where accommodation could be found and where rents are relatively cheap. The literature in this respect suggests that the role of the city centre as the port of entry for newly arrived migrants, is rapidly declining. (Harvey and Brand, 1974). This is because of the already high densities, high rents, and the conditions of the housing which necessitate clearance.

In cities like Jos, Ibadan, Central Accra and others, where parts of the city were initially left to the indigens by the Colonial Administration, Colonial housing regulations were not applied. Growth in these areas has been described as growth by 'Fission', resulting in very high densities. These old communities are often quite stable and do not seem to correspond with Turner's supposed reception node for the bridgeheaders.

Harvey et al (1974) found in Accra, Ghana, that 50% of those migrants who have been in the city for about twenty years were concentrated in the city centre. Most newly arrived migrants they observed, rent rooms in the peripheral settlements. These findings also correspond with those of Sada (1972) for Lagos, Tiwari (1972) for Nairobi.

Apart from the high densities of the inner city areas, the process of commercial expansion at the cost of low-income housing, is taking place in most cities where a real central business district is emerging. Although this is less pronounced in cities where the rate of economic growth is low, the clearance of a number of spontaneous settlements near the city centre has led to a reduction in housing opportunities for newly arrived migrants.

THE ROLE OF KINSHIP RELATIONSHIPS IN THE INTEGRATION OF NEW MIGRANTS

Turner's emphasis on the city centre as the reception node for newly arrived migrants, it seems, arise in part from the fact that his model ignores completely the role of kinship relationships in the migration and settlement processes. Consequently, the model assumes that rural urban migrants, migrate to the city on their own without contacts.

This may be the case in Latin America, but the evidence that there is from West Africa, suggests that migrants usually make their moves to a city where they can be expected to be received by a relative or some persons from the same village. (Plotnicov, 1967, Gugler 1979).

Peil (1972; P145-164) found that factory workers largely migrants to Accra, Kumasi, and Takoradi (Ghana) stayed with kinsmen on arrival.

Migration in the sub-saharan region as Kliet et al (1981) observed, is structured by the extended family. The large ethnic clustering observed in sub areas of Accra (Harvey and Brand, 1974) correlates with this fact.

Migrants who have lived in the city for some time offer support to newcomers. They often provide not only free accommodation but also use their established contacts and relations to find more stable accommodation and jobs for their newly arrived relatives (Plotincov 1967). Migration in this context is not at all a spontaneous exercise.

Widespread rural orientated social organisations which have emerged in West African cities, lend support to this argument. These social organisation arise in part due to the fact that migrants to the cities are expected to maintain contacts and eventually return to their hometowns. Guqler's (1979) study of Eastern Nigerian cities showed that only a few migrants break contacts completely and the hope of ultimate return is not given up until death.

The link between migrant associations, the individual migrant and the home community is expressed in many ways. The association makes remittance for development projects in the rural hometowns, they caution individuals who try to break contacts with home community and the individual visits his hometown as well as welcomes visitors from the village.

Obviously, the implication of this life style is that the demand they make on the urban system are likely to be limited at least in relative terms. The ultimate economic security remains in the hometown and their identity and emotional satisfaction are to a large extent derived from the rural homes (Sofier, 1973).

While it would be wrong to suggest that the situations described above are totally non-existent in Latin American countries, it is certainly true that the situation differs markedly from those obtained in the rest of the Third World countries especially West Africa. Settlement patterns seem to disintegrate under the impact of European economic situations. As a result the only ^{effective} social unit tends to be the household (Dwyer, 1975).

Regional association in Latin American cities as observed by Jongkind (1974) is essentially elitist, composed of well adjusted and successful migrants who have united in regional association out of solidarity but more for purposes of prestige and display. Such regional association must be regarded as purely urban institutions (Prakakis-Smith, 1981).

In most of West Africa where spatial ethnic clustering dominates the urban landscape, it is unlikely that typically Turner's patterns may be found. New migrants seem to fit into established residential patterns and do not proceed to the city centre. Social horizontal classification on the basis of income and professional status are likely to be cross-cut by old forms of ethnic structures. Intra-urban mobility - an essential part of Turner's model, does not appear to be the case in West Africa.

LOCATION OF EMPLOYMENT OPPORTUNITIES AND THE NEWLY ARRIVED MIGRANTS

Turner's model perceives locational proximity to areas of employment and employment opportunities as the most important priority for the bridge-header. This proposition of course, has some validity since the search for employment and economic betterment is one of the primary motivations to migrate in the first place. It is equally true that the presence of friends and relatives could enhance the possibility of achieving these objectives.

However, Turner assumes that urban employment is essentially centrally located and it, therefore, follows that newly arrived migrants would be concentrated in this part of the city. More recent investigations have brought to question Turner's assumptions about centrally located employment. This assumption does not hold any longer, even for large Latin American cities (Ward, 1983).

Industrial establishments are becoming more peripherally located for the benefit of better accessibility and where larger accommodation sites could be obtained at a relative cheap rate. This is also true of Jos and other Nigerian cities. This decentralisation trend has meant that the city centre is no longer attractive to newly arrived migrants.

This does not, however, mean that employment cannot be found elsewhere in the city. Small workplaces and general manual jobs as noted by Kliet et al (1981) could be found scattered all over the city. Indeed suburban squatter settlements themselves generate a broad scale of small commercial and other activities (Mangin, 1967).

CONCLUSION

It is evident from this literature review that although Third World uncontrolled sub areas owe their birth and continued existence to rapid urbanisation and the inability of authorities to provide adequate housing for the increasing population, varying migratory patterns, local land tenure systems, life style and in some cases the influence of colonial planning standards (or the lack of it) and the impact which these have had on settlement patterns have led to variation in the characteristics of the settlements.

Varying land tenure systems and characteristics of the migrants involved in the various parts of the Third World, has led to varying housing demands and arrangements for access to land for uncontrolled development. This has in turn led to a heterogeneity of housing forms within uncontrolled sub areas. Thus, the arrangement for access to land in uncontrolled sub areas as indeed the settlements themselves, cannot and should not be regarded as identical in all areas. They tend to be specific and vary from place to place.

A distinction must, therefore, be made between sub areas where the initial development occurred through organised invasion of land and those which emerged through gradual appropriation of land. The form it takes would seem to be indicative of the level of commitment of the people involved as well as the political will to pursue those ambitions. It is also important to distinguish between settlements which emerged through appropriation of government land and the others which might be on private land, customarily owned land and those on rented or leased land. Each of these types of settlements has its own policy implication, yet Turner's emphasis on security of tenure would seem to assume that all the areas are illegal settlement.

Besides the actual flow of migration which has given rise to uncontrolled sub areas, two elements of the process are of significant importance in the understanding of the types of settlements that they give rise to. They are the character of migration, in terms of whether migrant stream regard their stay in the city as permanent or temporary.

The literature review shows quite clearly that the character of rural-urban migration is a lot more complicated than have been assumed by the intra-urban mobility model. Significant variation in migratory

characteristics exists not only between the Latin American region and the African region but also between West and East Africa. The character of rural urban migration as expressed above may lead not only to varying housing demands but also varying housing ambitions in the city of migration. While permanent migrants strive to become consolidators, the temporary migrants appear to be contented with cheap rental accommodation to enable them to consolidate their positions in the rural hometowns. These varying housing demands and ambitions would obviously have a significant effect on the choice of settlement areas and on the future growth process of the areas.

The decision to migrate from a rural to an urban area is not in all cases a spontaneous process, as Turner's model would seem to suggest. In most parts of West Africa, migrants appear to have a well defined arrangement and destination, and the whole process seems to be structured by kinship and regional relationships. This has led to spatial ethnic clustering in some areas and has fostered the growth of ethnic based community groups perpetrating ethnic concentration. Within this spatial structure, it is not likely that Turner's patterns would be found. Ethnic stratification are more likely to over shadow any socio-economic stratifications.

The decentralisation of industrial establishment from the inner city, the high densities, high rents and the need to be within close proximity of friends and relatives have all combined to make the city centre less attractive to newly arrived migrants in some parts of the Third World.

These apparent variations would seem to indicate the limited application of Turner's formulation to the general Third World situation.

Despite variation in housing forms found in uncontrolled sub areas, it is not questioned whether these variations reflect differences in aspiration but it is assumed that the inhabitants of these areas strive to become consolidators.

Similarly, the model pays little attention to temporary migrants who might pose a different housing demand in the city. And just as few questions are raised about varying migratory patterns, so is little attention directed to the role of kinship relationships in the integration of newly arrived migrants. It is however, assumed that bridgeheaders would cluster around the city centre. The growth of uncontrolled sub areas is seen as resulting from social mobility and intra-urban mobility.

The literature survey would seem to suggest that the evidence from most of West Africa does not fit Turner's model. Implied in this misfit is that only permanent migrants strive to become consolidators. In other words varying migratory characteristics leads to varying housing demand, housing ambition and, therefore, settlement areas in the city. The succeeding chapters of the study will attempt to test these propositions including the reception nodes of newly arrived migrants to Jos, the location of employment and bridgeheaders in Jos, and the pattern of rural urban migration and social mobility in the city.

Given that migrants to most of West African cities are temporary migrants, the above proposition if validated by the analysis of the succeeding chapters would obviously bring to question the role of self-help housing policy as a solution to the low-income housing problems. Obviously, the situation as suggested by this review demands a combination of policies based on the specific requirements of the people involved and the kinds of settlement that have emerged in specific areas and specific conditions.

CHAPTER THREE

BACKGROUND OF THE STUDY AREA

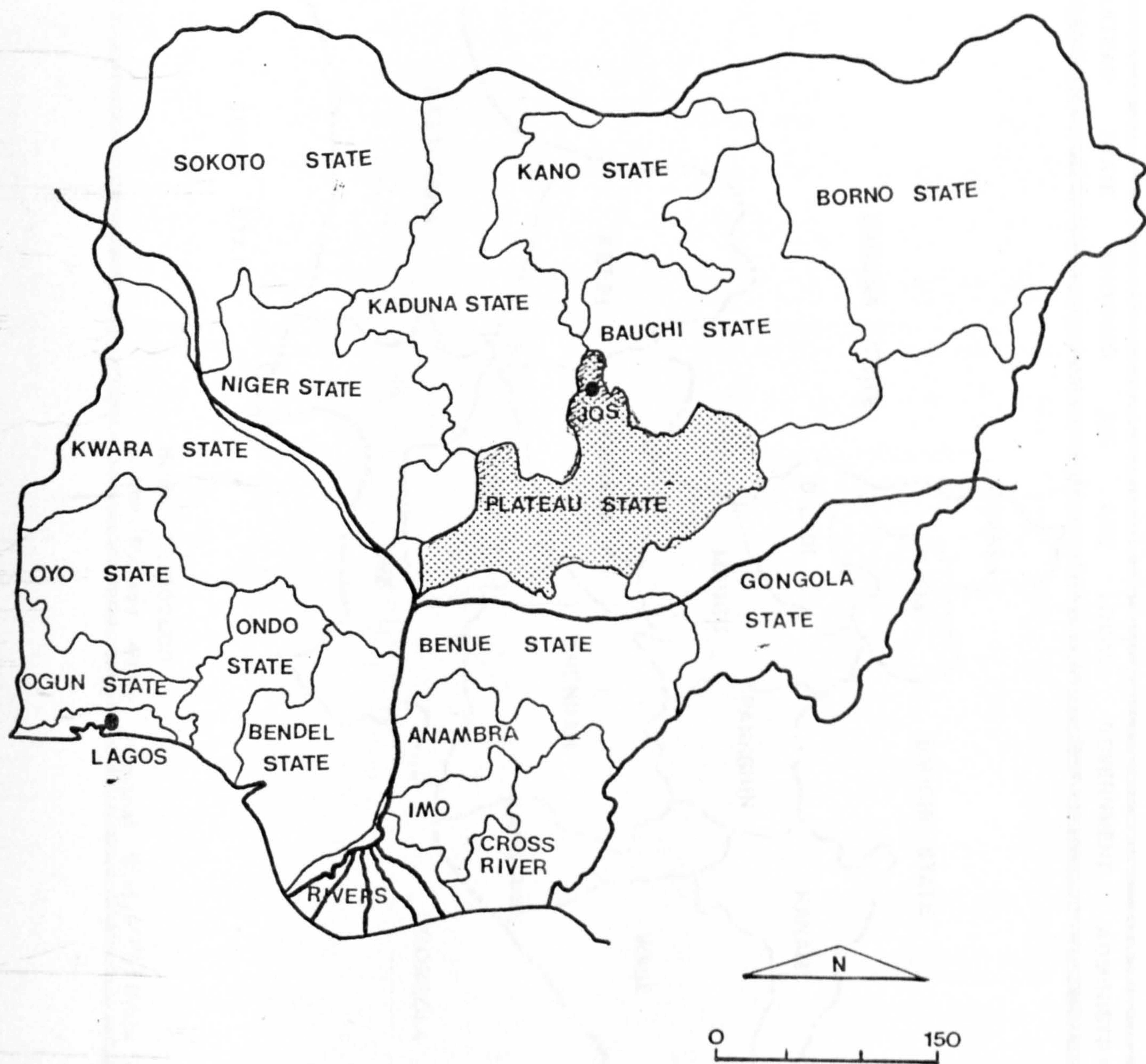
PHYSICAL SETTING AND THE ECONOMIC DEVELOPMENT OF JOS

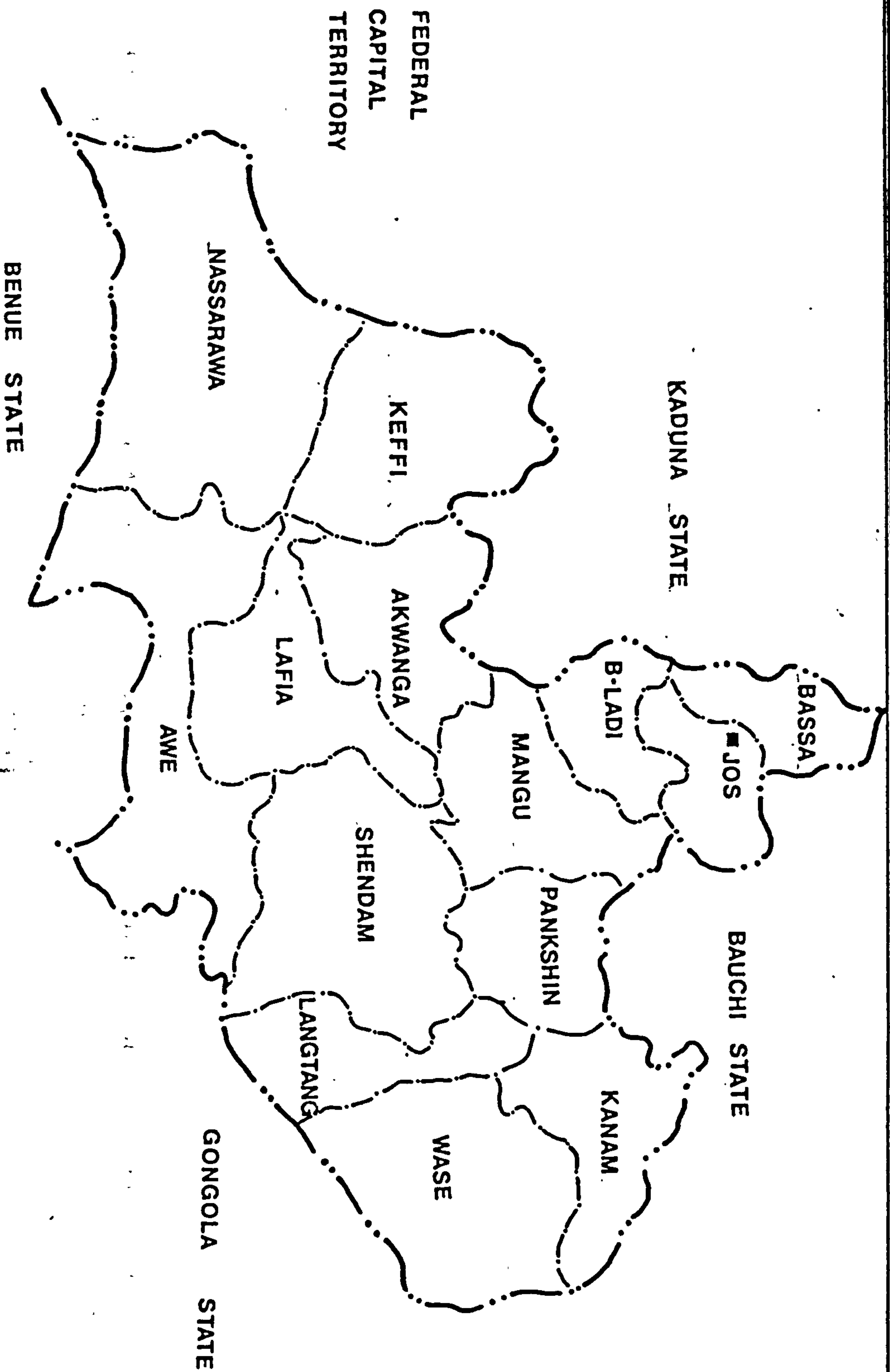
The city of Jos, situated on the Jos-Plateau about 4000' above sea level is both the capital of Plateau State (one of the nineteen states that make up the Federal Republic of Nigeria) as well as the administrative headquarters of Jos - Local Government Council area. Map 2 and Map 3 overleaf show the national setting of Plateau State and the regional setting of Jos respectively.

The State (Plateau State) which derived its name from the pre-dominant geographical landscape of the area - The Central Highlands, lies between latitude 7° and 11° N, and 7° and 25° E. It is part of the region referred to geographically as the 'Middle Belt' (Gleave and White, 1969). With an estimated population of about 2,026,657, Plateau State ranks 14th in terms of population size.

The city of Jos and the Plateau in general experience the same two types of climatic seasons as the the surrounding country with of course some modification arising from the high altitude. These two main seasons are the Wet and Dry seasons which roughly correspond with the summer and winter seasons of the northern latitudes. Yearly temperatures on the Plateau ranges from 50° to 95° F. Average annual rainfall is between 40 and 70".

48.
Map 2. MAP OF NIGERIA SHOWING THE NATIONAL SETTING OF PLATEAU STATE
AND THE CITY OF JOS





Scale:- 1:1500,000

source: Plateau State Regional Study(1978) Minco Associates

The bracing atmosphere of the Plateau led the early European settlers to believe it was one of the healthiest places in West Africa. This climatic attribute led to the designation of Jos by the Colonial administration as the provincial capital of the then Plateau Province. After Nigeria's independence (1960) the city maintained its status as the provincial capital, later in 1967 following the military take-over it became the capital of the then Benue-Plateau State comprising former Benue and Plateau provinces. It is currently the capital city of Plateau State. These attributes associated with other economic factors which will be discussed later in this chapter led to the growth of Jos as a contemporary secondary city in Nigeria.

Although the early settlements of Jos began in around 1905 to 1912 following the discovery of tin ore, the city was not officially founded until around 1915 (Hodder, 1959). Initially, Europeans were drawn to Jos-Plateau to exploit its tin ore. Nigeria was at one time the sixth largest producer of tin in the world. Its production accounted for approximately 5% of the world's total production and the Jos-Plateau produced the greatest part of this output (Plotnicov, 1967).

In addition to tin ore, the Plateau mine-fields produced such metallic ores as wolfram, zircon and tantalite; but only columbite has ever come close to challenging tin as the main metalliferous mineral exploited. Until the discovery of petroleum, tin was the major mineral export and the largest foreign exchange earner of the country (Minco Associates, 1978).

Despite its historic association with mining, Jos has achieved an enviable economic independence of the mining industry. While the city

owes its initial development to the mining industry, it has come to accrue much of its revenue and economic stability from transportation and other commercial activities arising primarily from its strategically central location as well as the advantages associated with its continued designation as provincial and much later state capital.

Since independence in 1960, development has been dispersed nationally to less developed parts of the country via the centres designated as regional and later State Capitals. Jos, like most other state capitals in the country has enjoyed the privilege of attracting both public and private sector investments and has become increasingly important as employment centre (Salau, A.T. (1979).

Unfortunately, most of the attempts to disperse development nationally did not go beyond the state capitals. Instead the capitals have become the major recipients of the share of investments in both the public and private sectors. The effects of this in human terms has been the continuous attraction of more people from the depressed rural hinterland to the already high natural population increase of the city. Plotnicov (1967) observed that Jos had a population of about 60,000 at the time of his study. In the year 1973 the population of the city was estimated at about 350,000 and it is said to be increasing at the rate of 8.5% annually, out of which 4.5% is attributed to rural-urban migration (Doxiadis, 1973).

The implication of this rapid increase in population in terms of provision of adequate housing is by no means small given all the constraints imposed on development and developers by the physical features of the city and the Plateau in general, constraints imposed by planning and building

regulations and the constraints imposed by the continued existence of mining leases around the city and the impact of mining activities which have left the land unsuitable for housing and other urban developments.

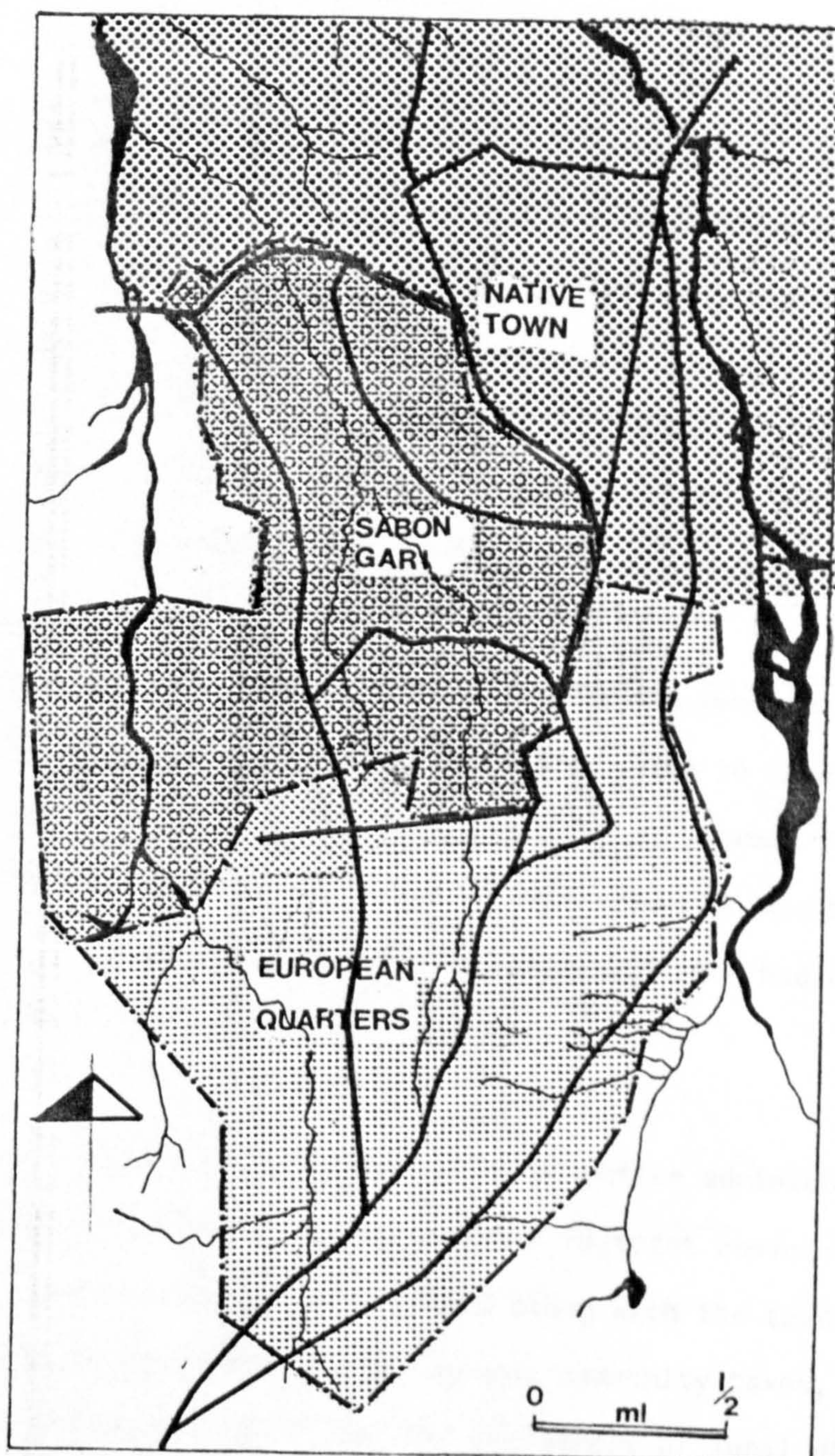
SETTLEMENT PATTERNS

The initial residents of Jos, were mostly labourers who came from different ethnic groups, from all over Nigeria, and most especially the Hausa, Igbo, Yoruba, Fulani and Kanuri. The indigens (Birom and Anaguta) constituted only a small proportion of the city's population. Settlements of these were initially based on tribal incoming (Jos Division, Annual Report 1953).

Perhaps, it was this observation that led the Colonial administration to keep culturally dissimilar ethnic groups resident in the city, separately. Consequently, the city was divided into two separate administrative units, namely; 'The Native Town' and 'Jos Township' or 'Sabon Gari'.

The 'Native Town' was subordinated to the then Jos Native Authority located at Naraguta (this was inhabited mainly by those of northern origin especially Hausa and Kanuri.) and the Township which was a separate entity within Jos Division was the residence of Asians and Europeans, but in a special 'Reservation' apart from the Africans (Jos Township report 1921). Map 4 overlaid shows the early settlement pattern.

Map 4. JOS: EARLY SETTLEMENT PATTERN



source: Plotnicov, L. 1967 STRANGERS TO THE CITY URBAN
MAN IN JOS

Within the Township, eight blocks with a total of 150 housing plots were laid out creating a separate residential area for non-African clerks and traders ⁱⁿ 'Sabon Gari', who did not come under the jurisdiction of the Native Authority (Jos Township report, 1921).

The initial settlements affected most parts of the present Hill Station Hotel, Plateau Club, Main Post Office, Department of Lands and Survey, Plateau Hospital, ST. LOUIS College. However, houses of miners scattered, and mining camps were built mostly in such areas where tin was plentiful such as Tudun Wada, Jenta Beriberi, Ungwar Atheri, Uthan, Anglo-Jos, Dogon Dutse and Rayfield-Jos (Gworn, 1983). These were under the jurisdiction of the Provincial office.

The intention and indeed the outcome of these measures was not only to separate non Africans from Africans but also to create residential, administrative and social segregation between the southerners who had earlier received some form of western education and training in modern occupational skills and the northerners who have had no similar training (Hodder, 1959; Plotnicov, 1967).

From all indications, the early form of Native administration of the city suggested a form of policy based on district consciousness, in which Native Town ward heads were used along with the traditional district chiefs in the collection of various community taxes, the allocation of development plots and the settlement of local disputes (Plateau Provincial report, 1953).

In 1932, the Yoruba community in the city demanded the appointment of Yoruba ward heads. Their demand led to an official establishment of

an advisory council to the 'Sarkin Jos' (The Hausa Chief of Jos).

The members of the Council comprised four ex-officio wards and twenty-three southern representatives of various ethnic groups who acted as advisers on matters affecting southerners and nominated African members to the Township Advisory Council. When the Jos Township council was established in 1950, members were elected on proportional ethnic representation within each ward, with ward councils acting as electoral college in the Town Council (Jos Div. Annual report, 1954).

Following these developments, the city gradually developed those characteristics commonly associated with West African non-traditional urban centres. A large proportion of immigrants, ethnic diversity and a tendency of ethnic groups to live in separate quarters and to be identified with specific occupations (Church, 1959 p. 15-28; Little, 1959: 19; Hodder, 1959; Urquhart, 1977).

While these divisions occurred originally for the reasons mentioned above (i.e. in line with Lord Lugard's indirect rule policy of effecting minimum intervention in the growth of cultural values) the Colonial Administration went on to set high housing standards within the Township and enforced a building code alien to traditional practices, preventing illiterates and low-income groups from settling within the Township. Unfortunately, some of these building codes and regulations are still enforced to date.

In addition, the force of inertia and familiarity and kinship ties perpetuated settlement division within the city. New migrants gravitated towards more familiar neighbours either because they were of the same ethnic group, culture, family or friends. Although

residential areas are not accorded ethnic designation, there is significant ethnic clustering in the Native Town and indeed the surrounding mining camps (Plotnicov, 1967; Hodder, 1959). One may also be right in suggesting that Lord Lugard's policy of residential segregation had an impression on the behaviour of the people.

The situation as observed by Ayeni (1979) is far from being desirable as locational and spatial behaviour militates against the cosmopolitanisation of the urban centre.

Church (1959) observed that European created towns usually have central administrative and commercial quarters, which is in complete contrast to African towns where there is little functional segregation by quarters and where commerce is often undertaken in or immediately outside the compound. While this was true of Jos in its early days, it has in recent years developed the traditional commercial activities in a mixed manner bannishing the original functional divisions.

Indeed, Ayeni's (1979) analysis of the functional association of land uses and activities in the city reveals not a predominance of few centres but a rather mixed and complex pattern resulting from relative lack of areal differentiation of activities.

This increasing mixed uses is not unassociated with the ever increasing population in the face of land and housing shortages. Yet the city did not have to cope with the problems created by squatting; the lack of residential security of tenure and property speculation in peri-urban fringe - a condition which Gutkind (1960 p. 129-131) observed in East African cities. Nevertheless, it has not been without similar

problems created by increasing demand for urban land. High rents in the face of housing shortage in the city has led to the growth of uncontrolled settlements around the city.

HOUSING PROBLEMS IN JOS

Housing is one of man's most basic needs, yet is grossly inadequate in both quantity and quality in Jos. The quality of the physical fabric and access to amenities such as water supply may be better than in the surrounding rural areas, but it does not make them adequate; and the urban environment poses additional problems in the way of overcrowding which is intensified almost yearly.

There have been three main sources of housing in Jos and indeed Nigeria as a whole, namely; Employer (especially governments and educational institutions), Rented accommodation (largely private sector housing) and the owner occupied sector (which can hardly be distinguished from the rented sector because often they are both).

Government housing has traditionally gone at subsidised rate to administrators and professionals, leaving the ordinary workers (except those employed by the Railway and the uniformed services) to fend for themselves in the open market. The housing market in Jos, as in most parts of Nigeria, has two distinguishing features. One of these features is that it is largely controlled by the private sector (e.g. small developers who own only one or two properties), Whereas many cities of the Third World especially the capital cities experienced governmental takeover of local property during or after the Colonial period, housing in Jos with few exceptions remained firmly in the hands of thousands of

individual property developers. Government housing notably in the G.R.A. (Government Residential Area) is an exception, but this makes up only a small proportion of the total metropolitan housing supply.

The second feature of the housing market is that it is often probably unrealistic to consider the distinction between the private sector rented accommodation and the owner-occupied sector because they are very often both one and the same. This is because most of the city dwellers occupy only one or two rooms rather than entire houses such that the house is shared between the landlord and his tenants. In Jos, about two-thirds of all the housing stock are in this category except in the older areas of Native Town where owner-occupation predominates (Minco Associates, 1978).

The government, University and the Multinational Corporations have been unable to build enough housing for their top personnel, as a result building for high cost rentals has become popular in the city. This has, over the years, reduced greatly the proportion of housing available to those in the lower-income group who must pay for their own accommodation. The result of this has been increased overcrowding and rent charged within the city especially in the cheaper dwellings of the main town or 'Sabon Gari'. Two to four person per room is the current occupancy rate, while from six months to three years rents could be demanded in advance of occupation (Minco Associates, 1978).

Whereas housing loans are available from the Federal Mortgage Bank and the State Mortgage Organisation, the bulk of these funds are used to finance yet more expensive housing. Managers of these organisations seem to regard such developments as better security. This is, of course,

not without foundation for the alternative is to lend money on illegally developed units.

The 'Greater Jos' master plan recommended a programme of low cost housing to be undertaken by the government of the state for the provision of better housing on a hire-purchase basis together with the corresponding community buildings. The plan estimated a minimum requirement of 6,000 such dwellings in 1978 but as yet no signs of such a programme has emerged. (Doxiadis, 1973 and Minco Associate 1978).

It is true that the 'Plateau State Housing Corporation' has constructed 250 so called 'low cost' houses in the city. (See Platel, overleaf) but these houses, as can be seen from the photographs, are again Western in style and construction, with 'Frills' such as pelmets and built in wardrobes. The cost of construction as at 1978 was around ₦15,000.00 per unit (Minco Associates 1978). This works out at about ₦194.00 per square metre. The rent fixed is ₦33.00 per month. If the conventional assumption that up to 20% of the household's income may be expended on rent is taken, then an income of *₦150.00 per month would be required by potential tenants. Yet a majority of the cities population earn below the official ₦60.00 minimum wage per month. Moreso, the low cost housing estate which is located about four miles from the city centre without school, shops and transport facilities, makes it impossible for low income groups for whom it was intended.

The housing shortage which the city of Jos experiences in terms of over-crowding and high rents, can in part be attributed to the failures of existing land and development policies to appreciate the dimension of the low-income housing problems.

* ₦1 approximately £0.80.



PLATE 1: ABOVE, A PANORAMIC VIEW OF THE LOW-COST HOUSING, LOCATED ALONG MIANGO ROAD - JOS. BELOW, IS A CLOSE-UP VIEW OF THE LOW-COST HOUSING UNITS.



LAND PROBLEMS

By law, all lands in Northern Nigeria have been Nationalised. The Northern Nigeria Land Tenure Law Cap 59 declares all lands in Northern Nigeria to be native land which shall be held in trust by the Governor for the common benefit of the natives. The 1978 land use decree which now supercedes the above law is also based on the same principle.

In theory, therefore, the transfer of customary rights to urban land has been replaced by a system of plot allocation derived from that introduced by the Colonial Administration. People wishing to develop land must apply for lease from the authorities, who are required to build-up land holdings and lay them out into suitable plots for development. The role of the authority, therefore, is to 'acquire' suitable land by extinguishing any customary rights which may be in force, to produce layouts for use of such land, and to provide the necessary infrastructure for development to commence.

In Jos, the Metropolitan Development Board i.e. The Plateau State Urban Development Board' is responsible for land acquisition, the preparation of layout plans and the provision of infrastructure (Edict No. 5, 1974). Plots are then allocated to developers by the Ministry of Lands and Survey under the control of the Land use and plot allocation committee. In certain circumstances the local government may also allocate plots. In all areas, however, the Ministry of Lands and Survey may grant leases of up to 99 years, while local Governments are limited to 30 years.

Over the years, the Authority has been unable to produce enough building plots to meet the growing demand. Many reasons contributed to this, including the cost of site preparation, the continued existence of

many unexpired mining leases around the city and the physical feature of the city.

DEVELOPMENT APPROACH

Apart from the fact that site conditions often create difficulties, the high standards of engineering and infrastructural provision which the Authority has adopted have served to push costs even higher. Minco Associates (1978) observed that distributors and estate roads were provided at current British Standards; an enclosed storm water drainage system and sanitary sewage mains are laid in anticipation of the Jos sewage scheme.

For most of the schemes, these costs work out at over ₦100,000 per plot of one acre. This is exclusive of expenditure on water supply, electricity and telephone services. Yet very little of these costs are recovered by the Authority. The ground rent charged to a lease on a residential plot is only ₦100.00 per annum. (Minco Associates, 1978).

The 'Greater Jos' master plan prepared by Doxiadis International Consultants (1975) recommended that the majority of housing plots required in the city between the late 1970's into the mid 1980's should aim towards meeting the needs of the low-income group. The plan actually specified that 74% of the plots should be of 260 square metre profile or less, a size thought suitable for low income housing. Yet as Minco Associates (1978) observed, recent Plateau State Urban Development Board layouts have maintained colonial type plot size - minimum of around 750 square metres and sometimes as large as 2000 square metres.

The effect of these practices has been to push costs up and deny the low income group access to serviced development land. Although the

right to apply for a plot of land is formally open to every Nigerian, access to such land has been limited to those who can afford an initial deposit of ₦500.00 (Land Form 1). In addition to that, the Authority have powers to reclaim any plot which is not developed within two years of grant.

Moreover, prior to the commencement of construction works, developers are required to submit drawings for details building control. As mentioned earlier, these are based on the 'Township Building Rules of 1940'. Apart from the fact that these regulations are intended to produce high cost buildings, they are Western in style and therefore incompatible with the form of housing which the low income group are accustomed to.

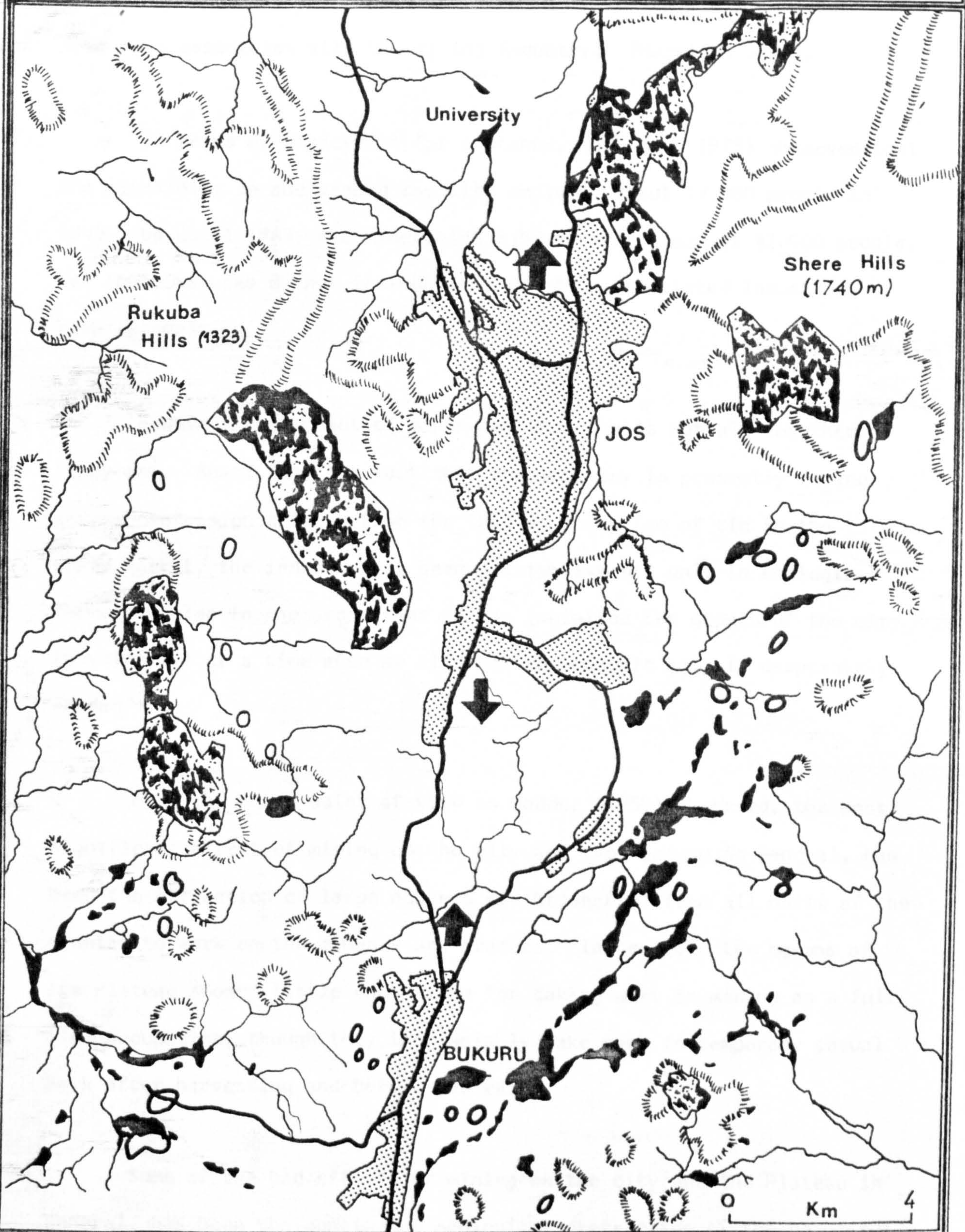
As stated earlier, part of the land problems which the city experiences, arise from natural features. The growth of the city and the development of land use patterns have been greatly influenced by its physical features. Jos Metropolitan area as illustrated by Map 5 overleaf, is dominated by steep shere hills, the Rukuba hills and other outcrops.

While the main trends of development as dictated by these natural features have not changed greatly, there is no doubt that Tin Mining activities and the patterns and manner of awarding mining leases, have presented an acute shortage of development land within the city.

THE IMPACT OF TIN MINING ON THE CITY OF JOS

As stated earlier, Jos Metropolitan area owes its birth to the mining industry. The past and to some extent, the present, distribution of roads, patterns and power lines bears a direct relation to the development of Tin mining in the area. The economic structure, the population

Map: 5 MAP OF JOS SHOWING PHYSICAL CONSTRAINTS TO URBAN GROWTH



— Roads

Existing city

Direction of actual growth

Forest Reserve & Wildlife Park

Natural obstacles
Rock outcrops, rugged hills

Man made obstacles
Reservoirs settlement etc.

composition and distribution, the forms of employment, all have been in some ways associated with the mining industry. (Harrigan 1979).

In terms of employment for instance, Harrigan (1979) observed that the minefields in and around the city employed about 79,000 people in 1940. Up until 1965, the minefields labour force stood at 42,000 people. Yet these figures do not include employment in associated industries such as smelting.

However, the impact of mining on the city is not all together a happy one. Apart from the fact that the industry is presently facing severe depression arising from the fall in the price of tin in the world market, the industry has been destructive not only in ecological terms but also in the sense that it has inhibited the growth of the city (physically) at a time when an alternative economic base is desperately needed.

From the human point of view as Hodder (1959) observed, the most significant effect of mining on the city and the Plateau in general, has been the attraction of large numbers of 'Strangers' from all parts of the country to work on the mines - and traders. In general, the pagans of the Plateau showed little enthusiasm for taking part in mining as a full-time occupation, though they increasingly take part in temporary casual work after harvesting and before the rains.

Some of the bad effects of mining on the city and the Plateau in general, has been the continuous ecological destruction of the beautiful plains of the Plateau arising from the predominantly open cast mining and the outdated and toothless regulations regarding reclamation. Mining activities have also accelerated soil erosion and the pollution of rivers

and streams by mining effluent. In housing term it has reduced the supply of suitable housing land. Map 6 overleaf, shows some of the areas disturbed by mining activities on the Plateau.

The continued existence of mining leases in and around the city has halted the supply of development land, especially for housing. The effects have been increased overcrowding within the inner city accommodation and high rents arising from the shortage. Yet prospecting for tin around the city is nowhere near completion.

On the Plateau as a whole, the Nigerian Chambers of Mines Bulletin (1972) reported that as at 1972, the total land area under mining leases had reached 510 sq. kilometres of the area of 839 sq. kilometres.

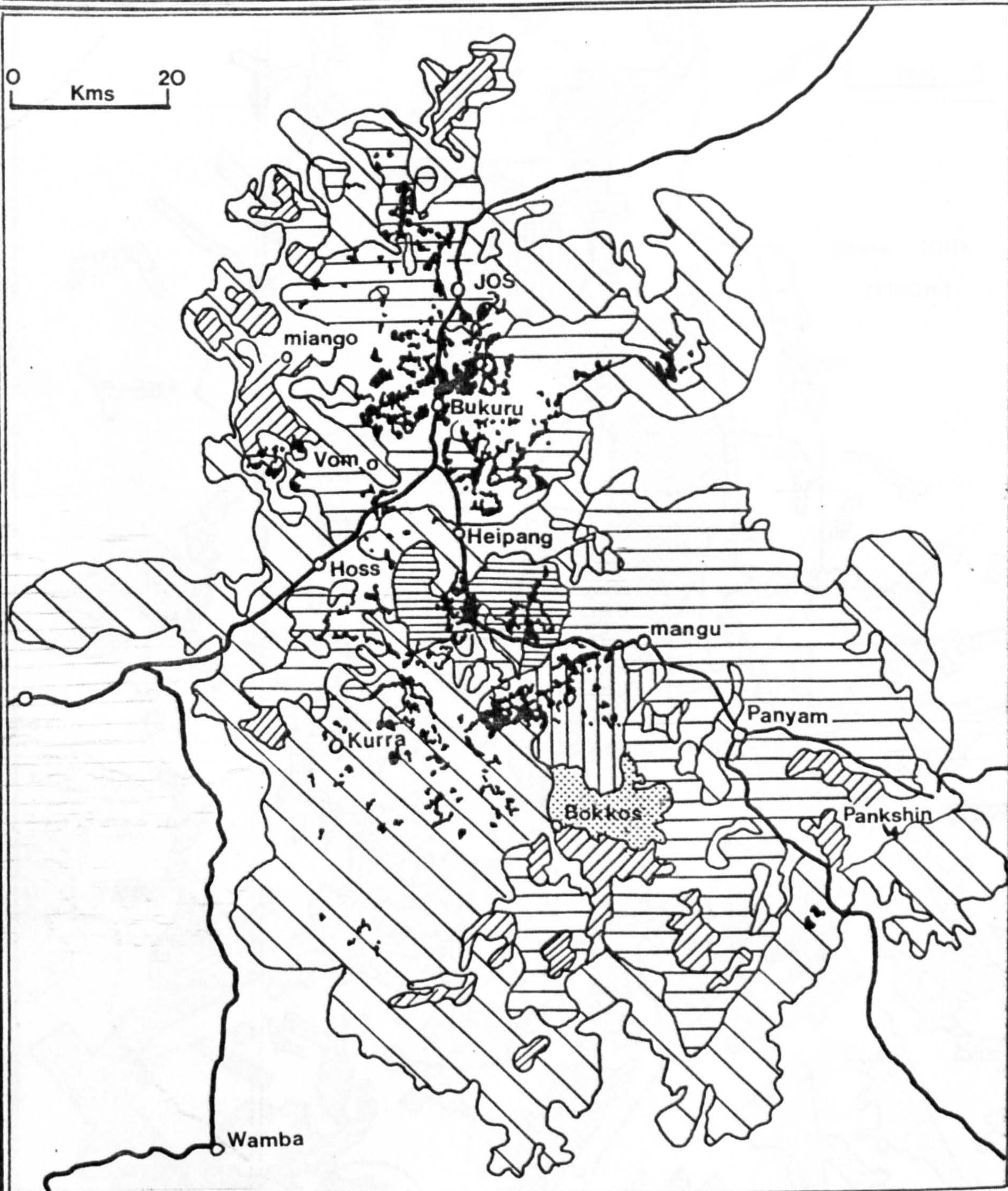
In terms of the distribution, these leases are concentrated in the former Jos Division especially around Jos Metropolitan area. Map 7 illustrates this fact. Within Jos division including the Metropolitan area, the proportion of untapped leases as at 1978 for the major prospecting companies were in the order of ATMN 91%, BISICHI - JENTA 65%, EXLAND 60% and GOLD AND BASE 16.8%. (Karshi, 1980). The implication for the growth of the city is by no means small, especially when it is realised that for practical purposes such lands are closed to other forms of development until the leases expire.

PROBLEMS ASSOCIATED WITH MINING LEASES AND THEIR COMPULSORY ACQUISITION

The land problem has been compounded by outdated legislation governing mineral working, especially the reclamation and restoration of mined lands and the acquisition of mining leases prior to their expiration. The regulations that exist were quite adequate in the early

Map : 6

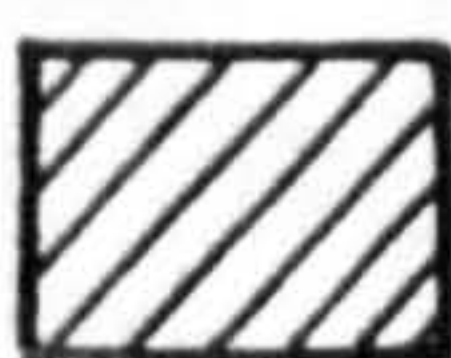
JOS-PLATEAU SHOWING AREAS DISTURBED BY MINING



Gully severity by length in metres per square kilometres



Over 3,500



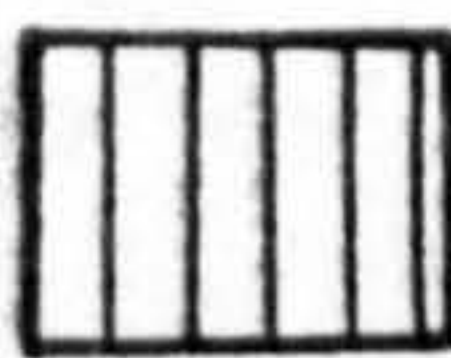
2,100 - 2,800



700 - 1,400



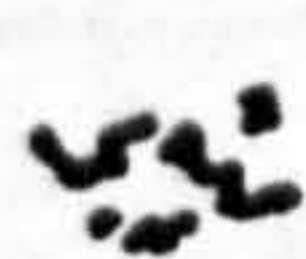
2,800 - 3,600



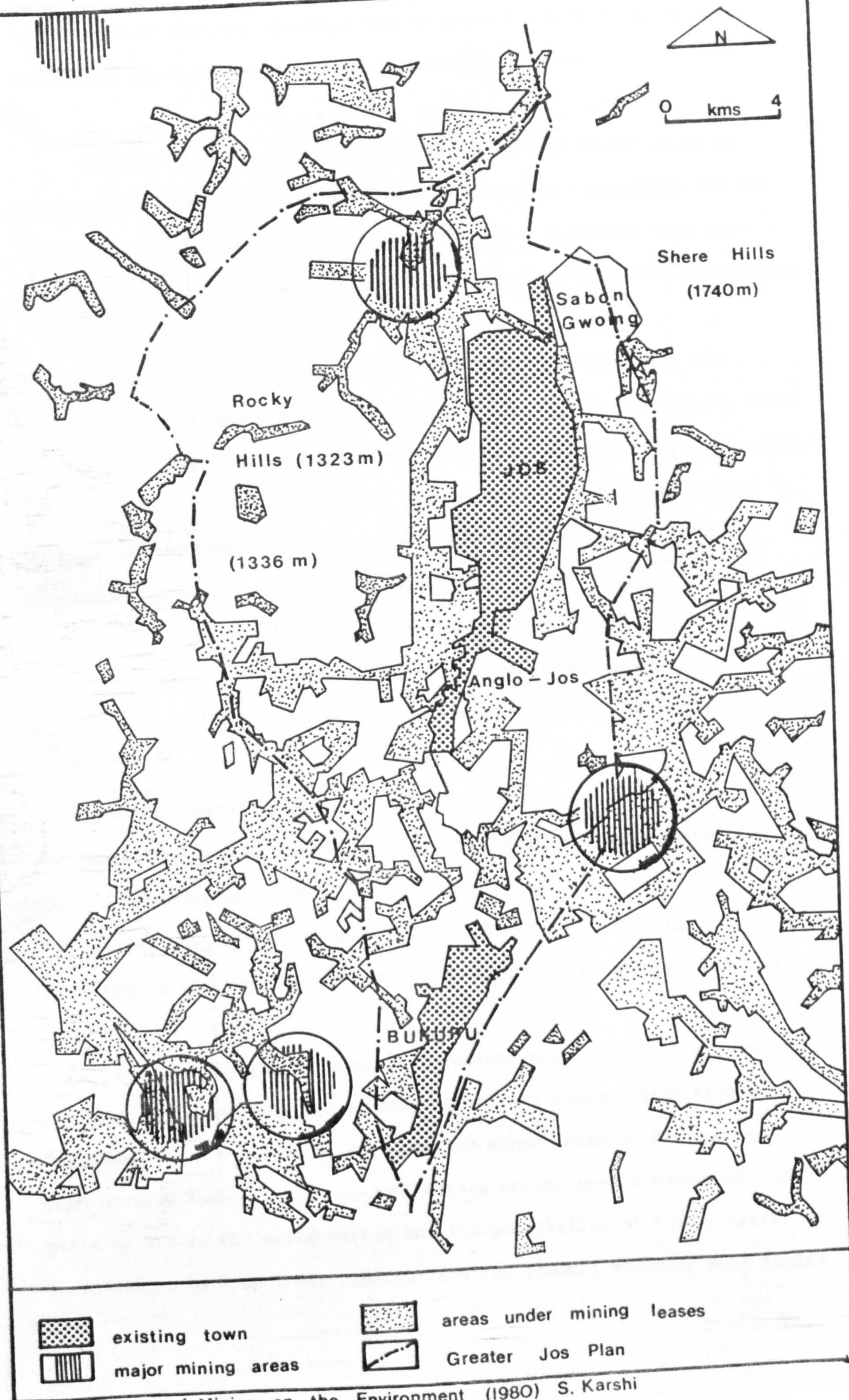
1,400 - 2,100



Under 700



Areas disturbed by mining



development of the city but have proved grossly inadequate with recent population increase and pressure for development land.

In almost all cases, conditions are attached to the award of mining permission, but the regulations lack adequate penalties for non compliance. (Karshi, 1980). As a result mining operators have been reluctant in working programmes and resources towards restoration schemes.

Land reclamation has in theory been done by flattening and filling of worked areas to certain percentages. While the Plateau State Government is responsible for supervising such reclamation and restoration of derelict mines, it has no legal powers to declare any area closed to mining. Powers regarding closure of mines lies with the Federal Department of Mines and Power; and the process is itself problematic. It involves inspection and taking of samples (at specific intervals) for examination to determine the economic or non-economic viability of mineral deposit. (Karshi, 1980). The process could take years.

Moreso, mining companies have their way round this provision of the regulation. Indeed as Hodder (1959) rightly noted, prospecting companies programme their activities to coincide with the price of tin. When prices are low, the miners restrict their activities to areas of low deposits leaving the areas of rich deposits for when prices look up.

Some mining leases have been acquired not because of the mineral deposits but simply for the purpose of getting compensation from the Government when the land is required for other forms of developments. Such unscrupulous miners have capitalised on the erratic nature of the price of tin in the world market and the possibility of future price increases to back up their applications for renewal whenever such leases

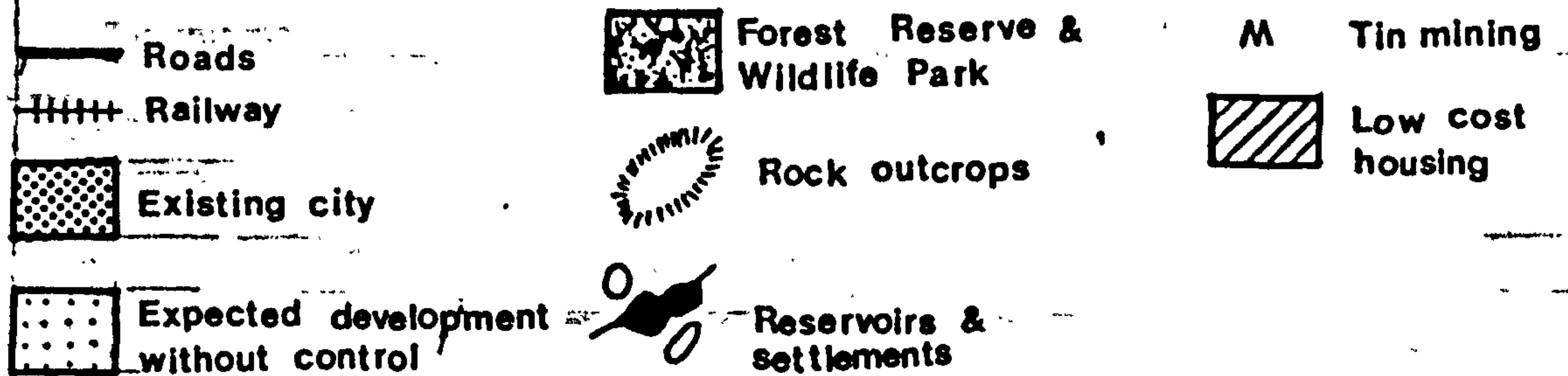
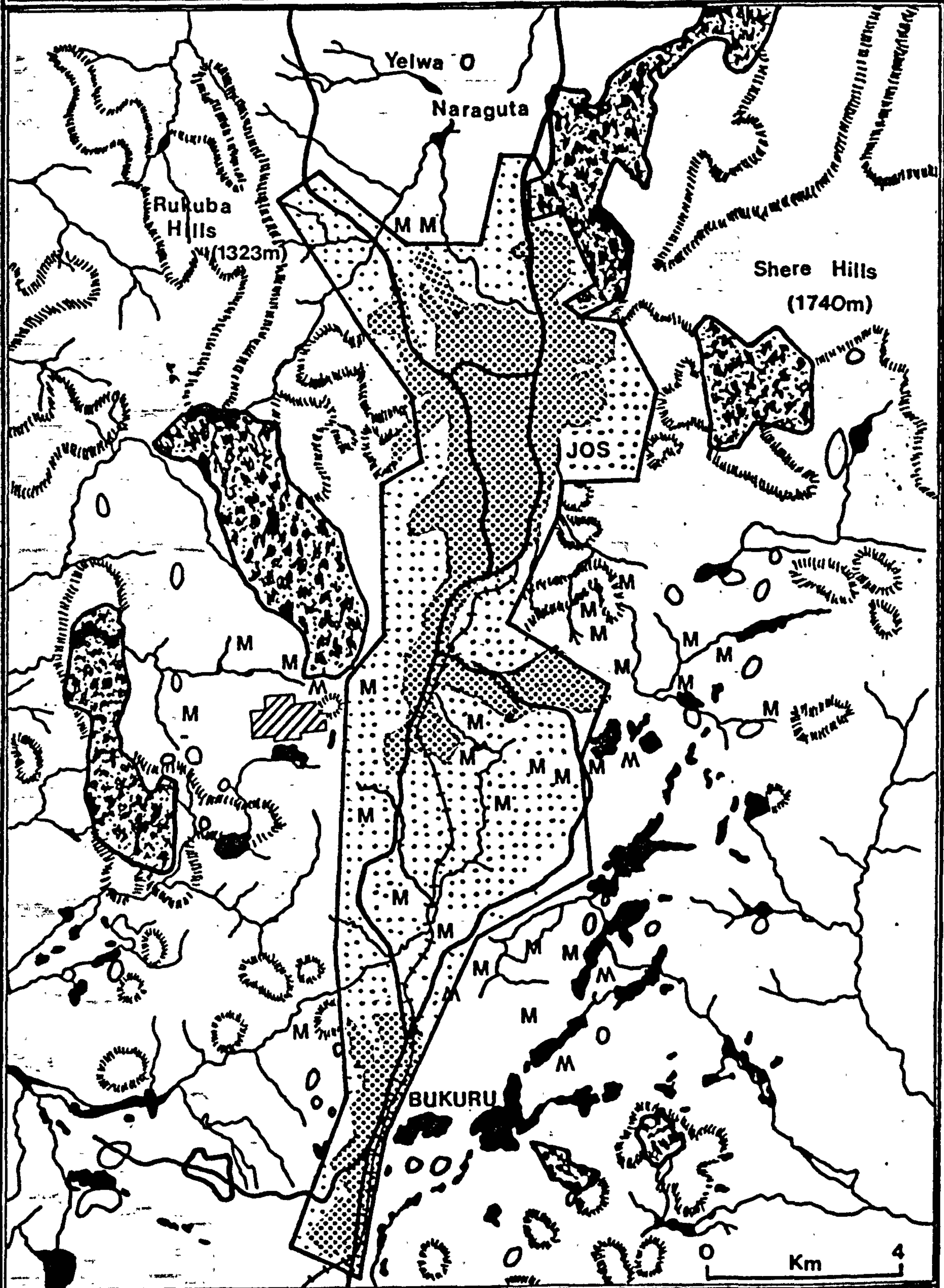
are about to expire. The power to renew mining leases (unlike other forms of development) rests with the Federal Department of Mines and Power and not the State Ministry of Lands and Survey.

An important aspect of Nigeria's Land tenure system is that both statutory and customary rights of occupancy of land can be revoked for mining purposes. The Land Use Decree (1978) empowers the various state Governments to extinguish rights on any land required for mining or related resources. This has placed both the Plateau State Government and The Jos Metropolitan Authority in a very difficult position regarding the provision of land for the city's development.

Perhaps of all the problems created by mining activities in the city and one which is the subject of this study is the encouragement of the growth of uncontrolled settlements around the city through the artificial land scarcity which it has created and the expansion of numerous mining camps that encouraged illegal development and makes development control almost impossible. Map 8 overleaf, summarises the constraints to the physical growth of the city.

Map 8

JOS: SUMMARY OF PHYSICAL CONSTRAINTS TO URBAN GROWTH



source: Impact of Mining on the Environment (1980) Karshi, S.

THE GROWTH OF UNCONTROLLED SETTLEMENTS IN THE CITY.

From the preceeding discussions, it is quite clear that the present system of plot allocation and Development practices do not acknowledge the housing problems of the low income groups. Official support for housing is almost entirely aimed towards expensive buildings.

These problems coupled with the land shortage which mining activities have helped to create, have led potential developers (who could not gain access to officially provided land or housing) to invest their savings in building houses in uncontrolled settlements especially within mining leases.

For most developers who cannot afford the officially supplied land including those who wish to build cheap rental accommodations, the mining camps offer a suitable alternative as they would not have to wait for the site to be serviced or indeed undergo the rigorous tests of planning and building regulations. Virtually all the uncontrolled settlements that exist in the city today were at one time mining camps. (Karshi, 1980).

Consequently, these mining camps have become the major growth area of the city. A senior official of the 'Plateau State Urban Development Board' estimated that in one settlement alone, about 2000 'illegal' buildings were built between April 1977 and April 1978. This constitutes about two-thirds of the overall number of new buildings in the city within that period. (Minco Associates, 1978).

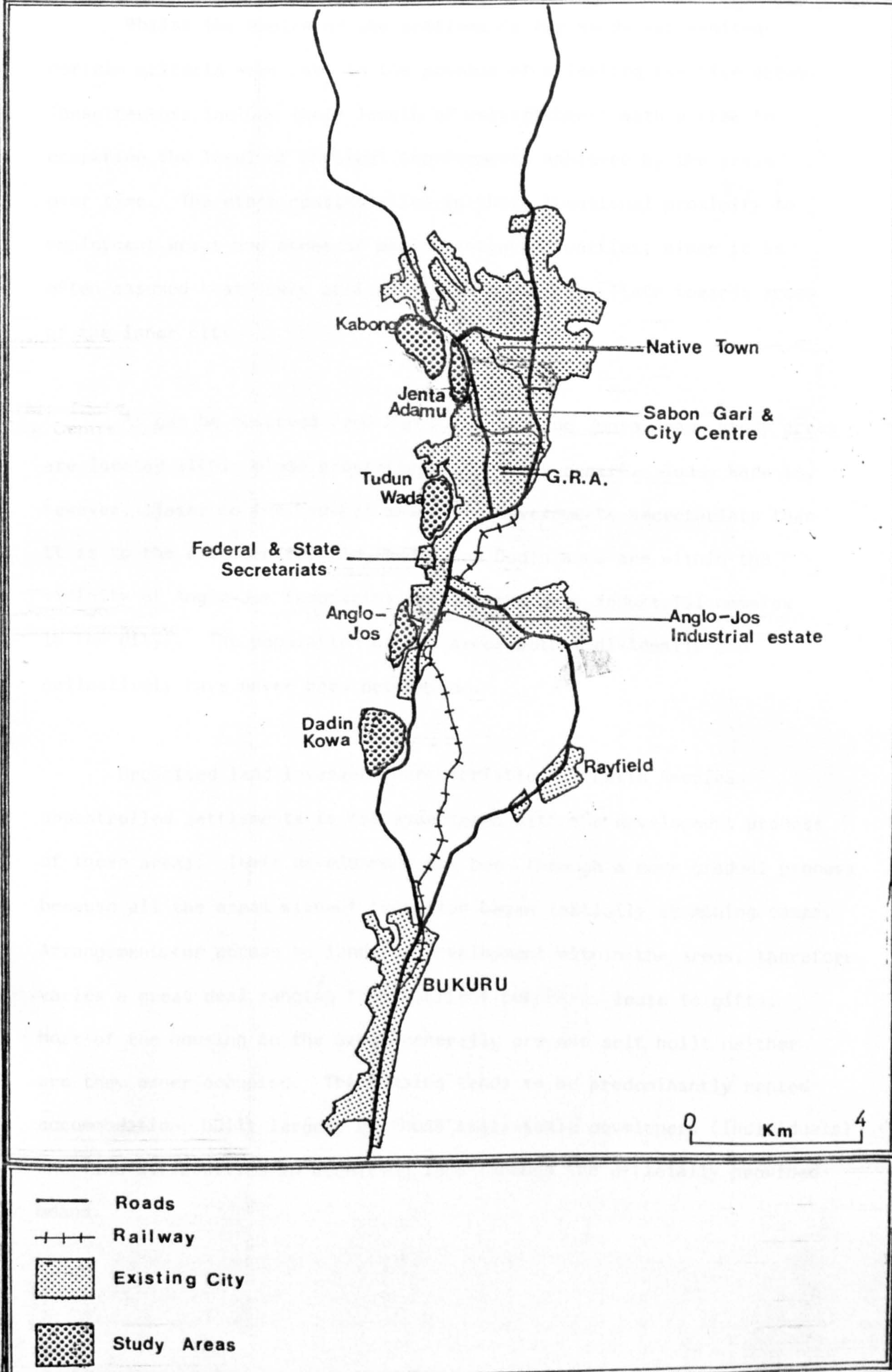
In most of the mining camps, the housing is made up of a few round huts, characteristic of Norther Nigerian Villages. Only in exceptional cases as in Anglo-Jos, Mai-Ardiko and Bukuru have the mining companies provided essential services such as water and electricity. In Anglo-Jos 'Gold and Base' provided about 16 units of rectangular houses with corrugated roofing.

Under the Land Tenure Law, Chap. 59 and indeed the land use decree of 1978, Lands covered by mining leases automatically reverts back to the Government on expiration of the lease. By the time most of these leases expire they are almost always occupied by uncontrolled settlements (where mining camps existed) perpetrating, therefore, the land shortage. As a result the city authority has over the years been inheriting a large number of uncontrolled developments.

THE STUDY AREAS: THEIR SETTING AND PHYSICAL CHARACTERISTICS

Five of the city's uncontrolled settlements have been selected for this study, all of which lie along the western periphery of the existing city. Prior to 1967, all the study areas were outside the city boundary but have since been incorporated within it. Map 9 overleaf shows the physical setting of the selected areas visa-vis the existing city. These areas are namely, from North to South:- Kabong, Jenta Adamu, Tudun Wada, Anglo-Jos and Dadin Kowa.

Map: 9. MAP OF JOS SHOWING THE LOCATION OF THE STUDY AREAS



source : S.Hirse, PhD Thesis 1984 – W.African Uncontrolled Settlements

Whilst the choice of the settlements for study was arbitrary certain criteria were used in the process of selecting the five areas. These factors include their length of establishment with a view to comparing the level of physical improvements achieved by the areas over time. The other consideration is their locational proximity to employment areas and areas of employment opportunities, since it is often assumed that newly arrived migrants will gravitate towards areas of the inner city.

As can be observed from Map 9, Kabong and Junta Adamu study areas are located within close proximity of the city centre. Tudun Wada is, however, closer to the Federal and State Governments secretariats than it is to the city centre. Anglo-Jos and Dadin Kowa are within the vicinity of Anglo-Jos industrial estate (the only industrial complex in the city). The population of the areas both individually and collectively have never been determined.

Organised land invasion characteristic of Latin American uncontrolled settlements is not associated with the development process of these areas. Their development has been through a more gradual process because all the areas without exception began initially as mining camps. Arrangements for access to land for development within the areas, therefore varies a great deal ranging from outright purchase, lease to gifts. Most of the housing in the areas generally are not self built neither are they owner occupied. The housing tends to be predominantly rented accommodation, built largely by those small-scale developers (individuals) who find difficulties in acquiring land through the officially provided means.

Physically, these areas have a lot in common, they are not laid-out in any rational form and lack paved streets or access roads, inadequate waste disposal facilities, water supply and such services often regarded as essential in other parts of the city. The exception is, as mentioned earlier, in Anglo-Jos where some of these services were provided initially. Access as can be seen from Plate 2 overleaf, is generally provided by a maze of footpaths of changing width, between 1 and 3 metres, which due to absence of surface drainage degenerate into 'quagmires' during the wet season. Few of the houses in these areas have private water supply or adequate sanitary facilities. Water supply is largely obtained from wells which are often polluted. For washing and bathing, it is not uncommon for residents to use adjoining streams or other water courses such as mining ponds.

As illustrated by the photographs of the study areas in Plate 3, Jos uncontrolled sub areas are not and have never been, the conventional stereotype of shacks made from card-boards, plastic sheeting, beaten out oil drums or any such materials recovered from the rubbish heap. At worse, the housing are like run-down village housing, while at best, they equal conventionally built cement housing. In between these polar situations are a wide range of cheap, well built housing, built predominantly of sun-dried bricks of various quality and types, sometimes plastered and painted. Mortar is of the basic mud variety and is occasionally mixed with cement. Floors range from concrete screed with matted surface, to beaten earth. Roofs are predominantly of corrugated iron. They are not, therefore, an agglomeration of temporary structures but rather of permanent structures.

The housing in these uncontrolled sub areas consists of a large number of small house units grouped such that they occupy all four sides



PLATE 2: ABOVE AND BELOW, SHOW THE TYPES OF ACCESS OF WINDING PATHWAYS FOUND IN THE STUDY AREAS, AS WELL AS THE VARIOUS TYPES OF CONSTRUCTION AND THE LACK OF DRAINAGE.



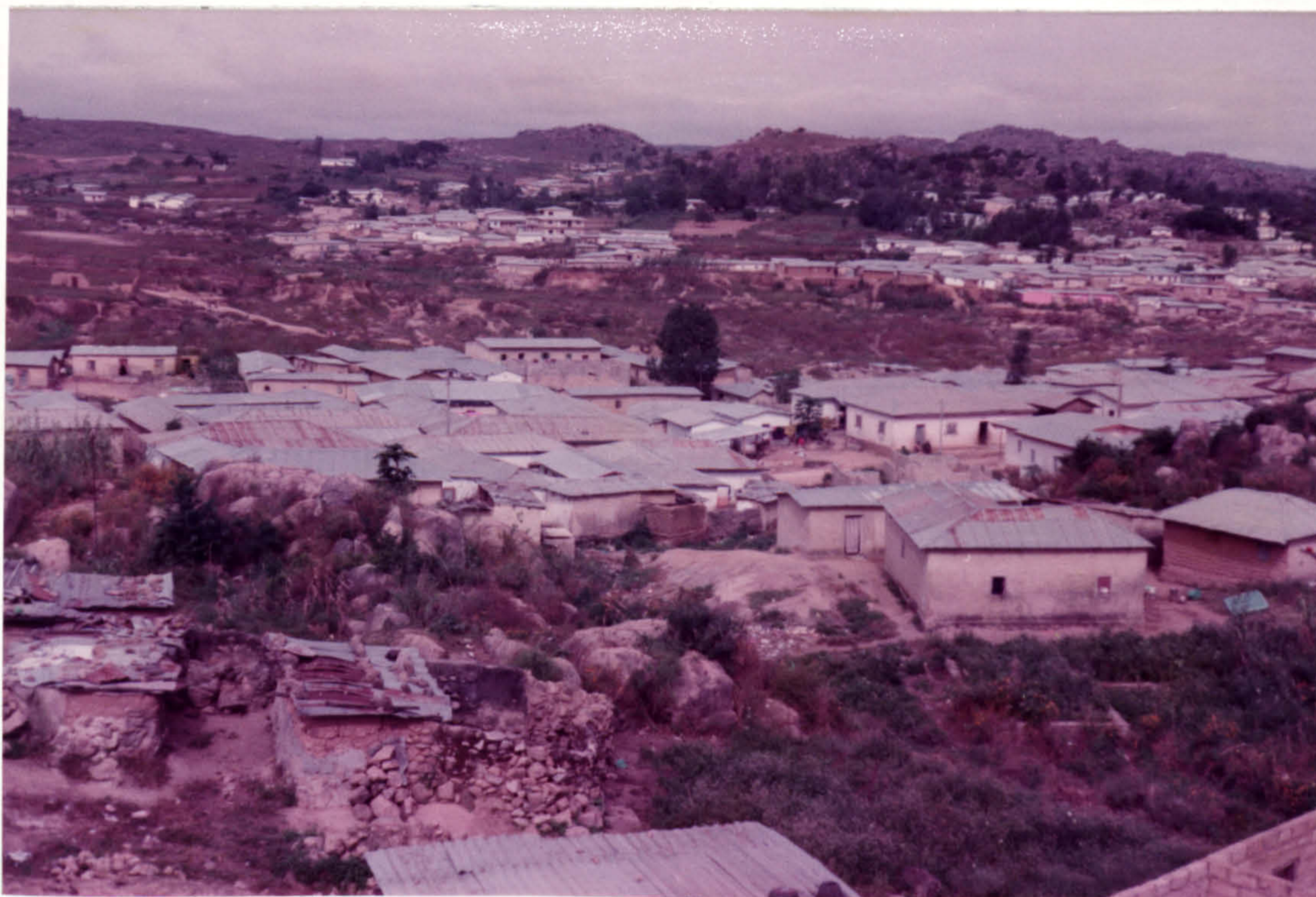
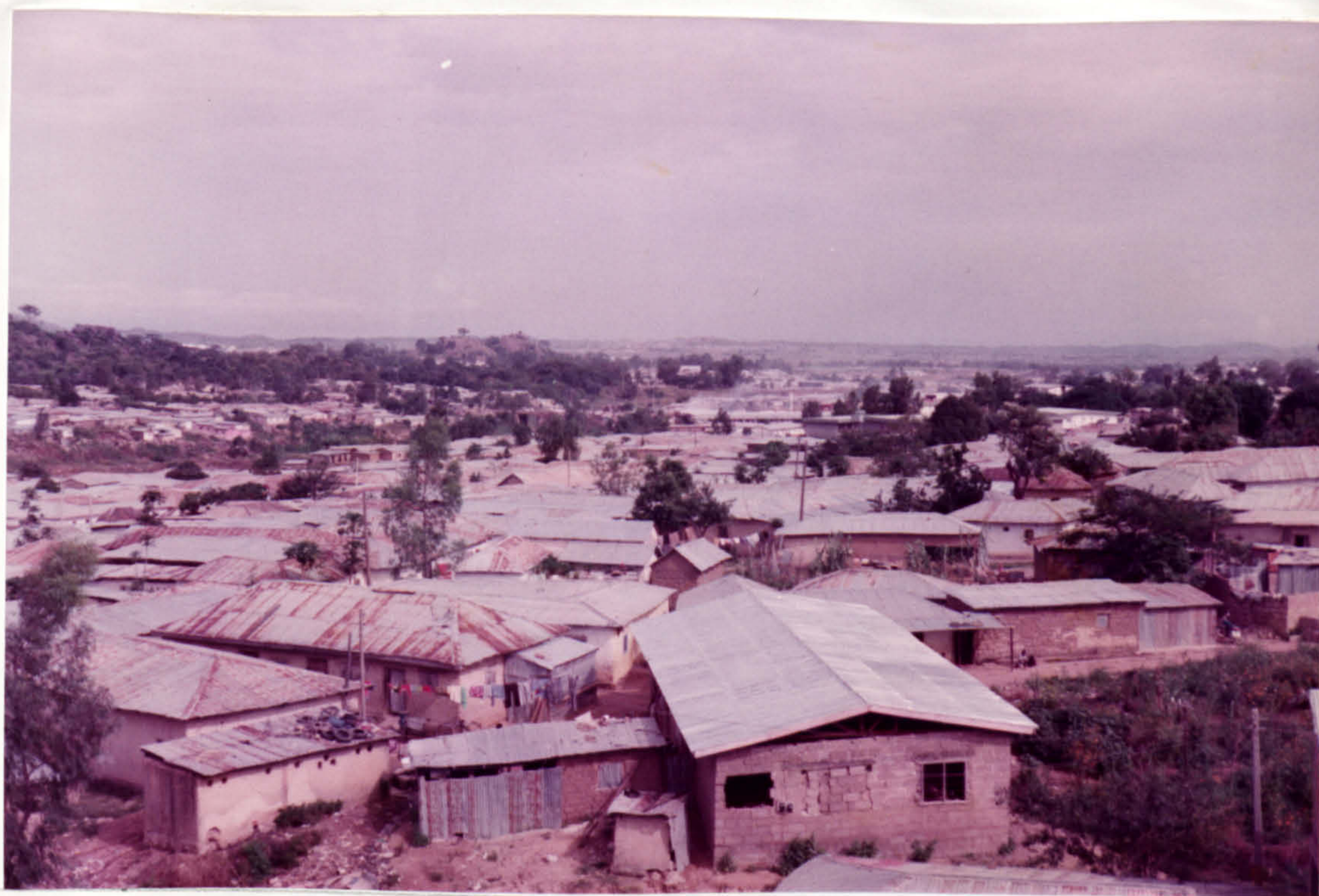


PLATE 3: ABOVE, A VIEW OF JENTA-ADAMU ON THE NEAR-SIDE AND PART OF KABONG ON THE FAR-SIDE SEPARATED ONLY BY A SMALL STREAM. BELOW, PART OF JENTA-ADAMU SHOWING THE TYPE OF ORGANISATION OF HOUSING FOUND IN THE STUDY AREAS.



of a rectangle, with only one doorway breaking the outer wall, but with many doorways of individual rooms opening on to a large central courtyard as shown in Figure 2B below. Where this is not the case, the plot boundaries is usually defined by a low wall or the line of a drain and related to adjoining houses. The inter-relationship between the house units grouped together and the circulation network provides the basic organisational framework of the settlement as show in Plate 4.

FIGURE 2B

TYPICAL PLANS OF HOUSING FOUND IN THE STUDY AREAS

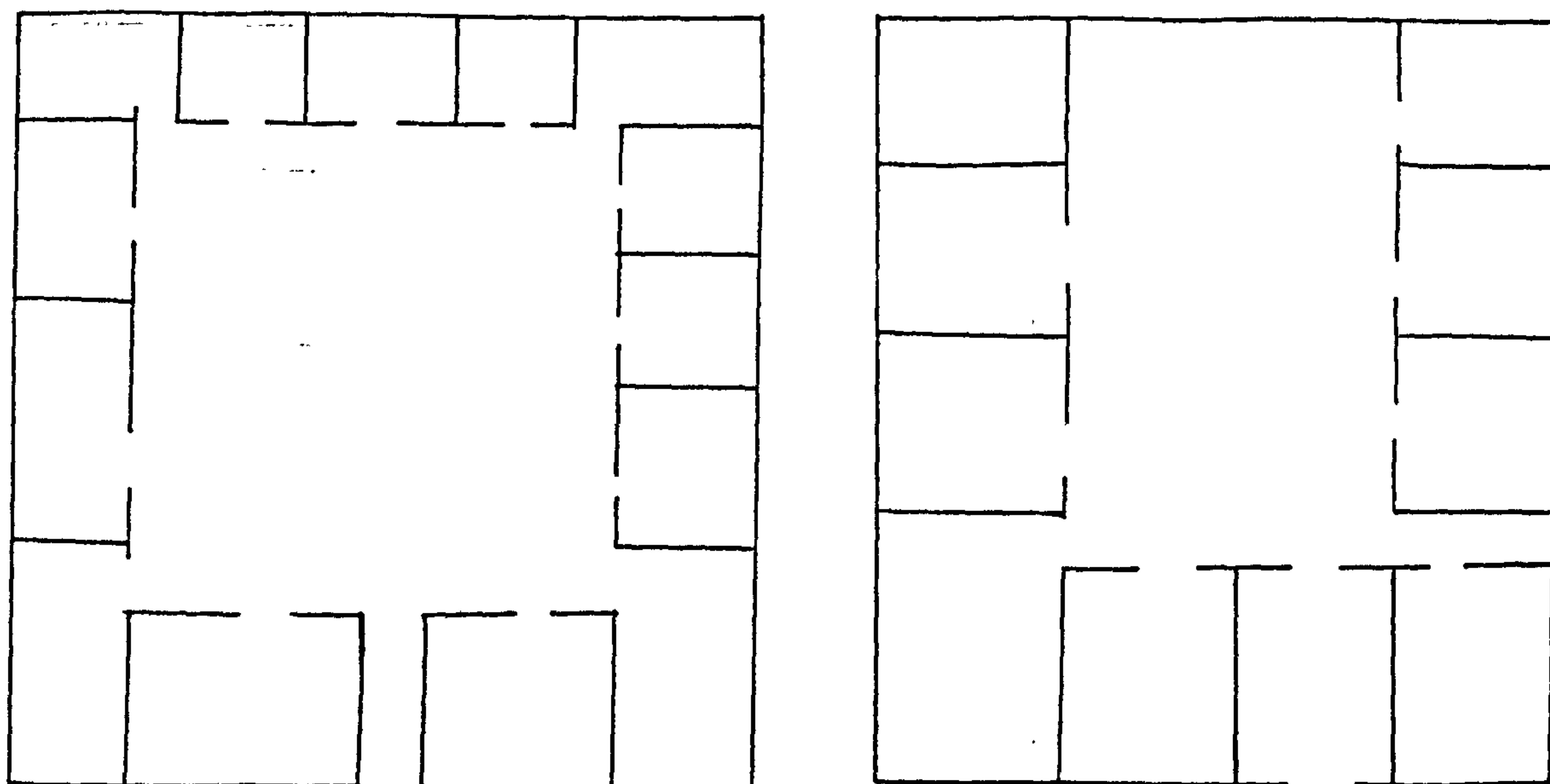




PLATE 4: ABOVE AND BELOW IS A PANORAMIC VIEW OF THE OUTSKIRTS OF TUDUN WADA SHOWING THE FEDERAL GOVERNMENT SECRETARIAT IN THE BACKGROUND



Playing and recreational areas are not available in these uncontrolled sub areas and children make use of the narrow lanes or footpaths as their play ground. These narrow paths are frequently used by young children as toilets until they are old enough to use the pit laterines. Some activities, such as the production of stronger beverages, are pursued easily down these winding paths.

Cooking is normally carried out in the courtyard because of lack of indoor space for such activity. In adverse weather conditions such as in the wet season, most of the cooking has to be done indoors.

Although the settlements accommodate a large number of people including not only the unemployed but also those employed in the public sectors (many of whom have lived in the area for a number of years) there is very little industrial or commercial activities on the sites themselves. The mining industry which provided most of the industrial employment on the site has since the mid 1960's been declining. However, the myth about uncontrolled settlements which equate the residents with the 'informal' sector of the economy is often not the case in Jos uncontrolled sub areas. Many of the residents have jobs in the large-scale or formal sector.

Commercial activities in the study areas take the form of small markets held daily at which staple food items are sold, mainly by women. The markets are also supplemented by several small lock-up shops which sell a variety of domestic and general goods including soap, cigarettes, clothes etc.

ATTITUDE OF THE AUTHORITY TOWARDS UNCONTROLLED SETTLEMENTS

'Illegal' buildings in the city have been the subject of occasional action by the city authority. The Nigerian Army made several clearances of structures encroaching on main roads in the city but this has only led to further growth in the major uncontrolled settlements (Minco Associates, 1978).

There have been many challenges and protests at the activities of the 'Plateau State Urban Development Board'. The 'Nigerian Standard Newspaper' in its editorial comments captioned 'Jos, Plot Allocation' and another article in the same newspaper entitled 'Involve the indigens in your Development Schemes' bitterly criticised the activities of the Board following a front page news item on the 21 January 1978 that the Board had detected 500 'illegal' buildings which it intended to demolish.

The 'Kabong Community Development Club' which appeared to be most affected engaged itself in a series of exchanges with the Board. In a letter to the Board entitled 'Disturbance', they requested the Board to avoid embarrassing the Community. The response was that the Board has powers under the edict that brought it into existence, to prosecute anyone putting up buildings without the prior consent and approval of the Board. Thus, the attitude of the authorities towards these subareas is one of eradication without relocation.

Uncontrolled developments of the type discussed above are not unique to the city or indeed Nigerian cities alone. They are a common phenomenon in most Third World cities. However, contemporary studies in other Third World countries (notably Latin American countries)

suggests that uncontrolled subareas are self improving suburbs and therefore calls for a policy of improvement and integration and not eradication as practiced in Jos.

It is in the light of such findings that reputable aid foundations such as the 'World Bank' and the 'United Nations' have advocated self-help housing policy through 'site and service schemes' and such similar approaches. Yet there is increasing evidence which suggests that fundamental differences in terms of migratory patterns, land tenure systems, culture and life style exist between Third World countries.

In most of West Africa including Nigeria, personal and culturally shared experience of migrants could significantly influence their adjustment to urban life, which might lead to poor or negligible adjustments to city life. It is pertinent to examine at this stage the residents of Jos in terms of their socio-cultural ties.

ETHNIC RELATIONS IN JOS

The population of the city consists almost entirely of migrants or what Plotnicov, 1967; Hodder, 1959; termed 'Strangers to the Land'. Owners of the land (the indigenous Birom and Anguta people) make up less than 2% of the urban population (Plotnicov, 1967). The extreme heterogeneity of the city reflects the variety of people in the country, of whom almost all are represented.

This ethnic heterogeneity as Urquhart (1977) rightly observed is not at all unique to Jos, but a characteristics of Nigerian Colonially created cities. Many of the immigrant population he observed were only

short term residents of the townships, attachment to the urban landscape therefore was temporary and not conducive to the emergence of an enduring urban culture with strong new traditions.

While the city's population may view themselves as living in an alien community, they do not regard themselves as living in a social and cultural limbo. Indeed as Plotnicov (1967) observed, ethnic associations affect all designations and social relations. Government reports makes generalisations based on attributed ethnic characteristics. Official census figures are also based on ethnic grouping and the people themselves have a strong attachment to their ethnic groups which determines in varying degrees their political and religious affiliations, life style, occupation, business opportunities and other life habits.

Strong ethnic loyalty therefore is fundamental to most residents of the city. Although this allegiance is somewhat cross-cut by political and religious differences, the results of such expanded loyalties is some limited restructuring of the urban community. Ethnic groups are sometimes divided and members of different ethnic groups come together on religious or occupational bases.

Nevertheless, loyalties are still primarily aimed towards the individual's ethnic group and kinsmen. Assisting kinsmen and members of one's ethnic group is regarded not merely as an obligation but also as possible future reciprocal investment.

Conditions of traditional society dictates that kinship and community institution provides individuals with economic, social and psychological security. Migration out of the traditional community upsets

these assurances. Consequently, in Jos ethnic unions have emerged to meet the needs which would otherwise be satisfied by traditional institutions and which neither the government or other individuals could cater for.

These unions do not only provide the positive satisfaction of moral and economic support, but also ease the migrant's entrance into the city. In terms of expressive functions, the ethnic Unions are instrumental in providing members with assistance and care for the unemployed, the sick and those in need of accommodation.

Furthermore, Unions provide a link with the rural homeland through the communication of persons, information and commands between the home area and various branches and they attempt to carry on home culture and tradition in alien communities.

Deep emotional and often strong ethnic ties bind the individual migrants through their respective Unions in the city to their native hometown. The immigrants express these ties by sending gifts and contributions towards community development funds at home. Most importantly, perhaps, by planning to return to their hometown with the onset of age and retirement.

While migrants to Jos appear to nurse these desires, Plotnicov (1965, 1967), concluded that many will fail to realise their ideal of returning home arguing that it is difficult to expect them to readjust to 'Uncivilised' ways after they have become accustomed to town amenities. That because they came to the city for the purpose of making wealth they feel bound not to return empty handed.

If this were to be the case, then the possibility of achieving any meaningful improvement in the settlement of migration could be regarded as nil since only the very poor would be left behind in these areas.

CONCLUSION

From the preceding descriptive analysis of the dynamics of the growth of Jos, it is quite clear that a number of factors including the climatic attributes of the Jos-Plateau generally, the endowment of tin and other mineral resources, the successive selection of Jos as political and administrative centre, as well as the services it provides as a regional centre were involved in stimulating the growth of Jos as a contemporary secondary city in Nigeria.

The prevailing land and formal housing policies have contributed immensely in reducing the city's capacity to absorb the attendant population increases leading to the birth and continued growth of uncontrolled settlements. The supply of urban land for housing development has been grossly undermined by mining activities in and around the city that have rendered the land unsuitable for development as well as the difficulties of compulsorily acquiring land under mining leases.

Attainment of required housing targets in the city has failed because of the apparent incompatibility not only between high standards (and consequently high unit costs) and low income levels but also the resources required on the part of the authorities to implement those standards which they have set themselves in terms of infrastructural provisions. This has meant that only a small number of plots can be

serviced for development. This has also meant that only a correspondingly small number of houses can be built compared with the number needed and the high cost of implementation inevitably pushes the rent payable above the reach of the groups for which it was intended leading to overcrowding within the city.

The absence of a viable alternative housing coupled with the difficulties of getting development land through institutional means has resulted in various kinds of arrangement for access to land for development largely on land under mining leases leading to uncontrolled settlements.

While the problem calls for urgent and appropriate action on the part of the city government, the policy of eradication without relocation currently enforced in the city might not provide a lasting solution. Yet even the most advocated self-help housing policy does not appear to offer a better prospect. The evidence that there is, indicates that the settlements in Jos may not be dominated by consolidators. The settlements themselves did not emerge as a result of intra-urban mobility or through land invasion. The strong emotional and cultural ties that exists between the residents of these settlements and their rural hometowns seems likely to inhibit the complete adjustment to urban life. These factors would affect substantially the prospects offered by the self-help housing solution.

CHAPTER FOUR

TURNER'S INTRA-URBAN MOBILITY MODEL AND JOS UNCONTROLLED SUBAREAS

In this chapter an attempt is made to analyse the survey data in the light of Turner's model of intra-urban mobility in which rural-urban migration, upward social mobility, intra-urban mobility and the growth of uncontrolled settlements are held to be interrelated.

The approach adopted involves testing some of the assumptions upon which the model is based, which includes the assumption that the city centre is the reception node for newly arrived migrants or 'bridgeheaders', the assumption that all bridgeheaders strive to become consolidators and that employment is highest in the priority of the bridgeheaders. Each of these assumptions is considered in turn.

PORT OF ENTRY FOR THE NEWLY ARRIVED MIGRANTS IN JOS

Turner's formulation states that after an initial period of renting an accommodation in the inner city, the more successful migrants strive to find a building plot in one of the unauthorised settlements where they construct and subsequently improve their houses over a number of years. Obviously, this proposition supposes that the city centre neighbourhoods are the entry points of newly arrived migrants to Third World cities.

However, the data collected for this study shows that only 14.9% of the 394 respondents stayed initially in the inner city wards of Native town, Main town, Bauchi road and Gangere. The majority 52.03%

moved straight to one of the five study areas. These findings also correspond with those of Mainet, (1979) for Douala, Cameroon, and Harvey et al (1974) for Accra, Ghana. Similarly, Harrison (1967) and McGee (1967) pointed in their studies to the declining role of the city centre neighbourhoods as the reception node for newly arrived migrants.

These findings would seem to suggest that contrary to Turner's assumptions regarding the city centre wards as the main reception areas, the uncontrolled subareas in Jos appear to be the main entry port for newly arrived migrants to the city. It also demonstrated quite clearly that the uncontrolled subareas could not have emerged as a result of intra-urban mobility from the inner city. The data shows that almost all the respondents who moved to the inner city wards on arrival stayed with friends and relatives. Analysis of their reasons for moving to one of the study areas shows that most of them moved to stay in cheap rented accommodation and not for the purpose of building their own houses. Indeed, the data shows that there are a lot more movements between peripherally uncontrolled subareas than there is between the inner city and the uncontrolled settlements. On the whole 32.8% of the 394 respondents were involved in movements between uncontrolled subareas compared to the 14.9% who stayed initially in the inner city wards. Analysis of their reasons for moving also shows that a large majority of them have stayed initially with friends and relatives and have moved to occupy their own rented apartments.

A number of reasons accounts for the declining capacity of the inner city to receive new migrants and for the growing importance of the uncontrolled subareas in performing their role. This is partly because of the very high occupancy rates (high densities) characteristic

of the inner city areas discussed in Chapter three: this has also been compounded by the fact that the native towns and indeed most of the inner city wards (with the exception of the main town) were initially left to the indigenous population without the benefit of Colonial planning and building regulations. Densities in these areas were high and remained high yet the buildings themselves are crumbling with increasing age. Whereas the more successful are able to move out of these declining areas, their vacant houses are replaced as in the case of 'Dilimi Street' by the new market extension at the expense of cheap rental housing. Thus the inner city niches are not only being reduced in number but are also kept filled. These developments have had the effect of reducing inner city accommodation and increasing rent levels. Cheap rental accommodation in Jos is becoming less associated with the inner city areas. Whereas, newly arrived migrants attach great importance to cheap rental accommodation. They must therefore go elsewhere.

The data obtained from the study areas supports this argument. 47.9% of the 394 respondents moved initially to one of the five study areas (on arrival) to benefit from the relatively cheap rented accommodation they offer. This finding seems to correspond with those of Harvey et al (1974), Sada (1972) and Tiwari (1972) although these studies were based on capital cities.

THE ROLE OF KINSHIP RELATIONSHIPS IN THE INTEGRATION OF NEW MIGRANTS IN JOS

Kinship relationships which Turner's model apparently ignored appear to play a significant role in determining migrants initial

area of residence in Jos. 43.4% of the 394 respondents moved initially to one of the study areas not for the benefits that might be achieved from cheap rented accommodation but because of friends and relatives. These results would seem to indicate that in Jos, the availability of cheap rented accommodation and the presence of friends and relatives in uncontrolled subareas are the main reasons why newly arrived migrants move to these areas.

The importance of ethnic and kinship relationships in determining settlement patterns in Jos uncontrolled subareas is also supported by the presence of significant ethnic clustering in some of the study areas. In Kabong and Jenta-Adamu study areas 24.5% and 31.6% respectively, of the respondents are ethnic groups from Bassa local government area. However, in Tudun Wada study area, 36.5% of the households interviewed belong to ethnic groups from Langtang and Shendam local government areas, while in Dadin Kowa study area there is a significant presence 25.6% of respondents from Pankshin and Mangu local government areas. These proportions are not large in absolute terms but they are significant considering the fact that there are over 200 ethnic groups within Plateau State alone.

Within this residential pattern, it would seem rather difficult to apply socially vertical stratifications on the basis of income or professional status as the intra-urban mobility model seems to suggest. Any such stratification it seems, are likely to be overshadowed by old forms of ethnic stratification and group particularisation.

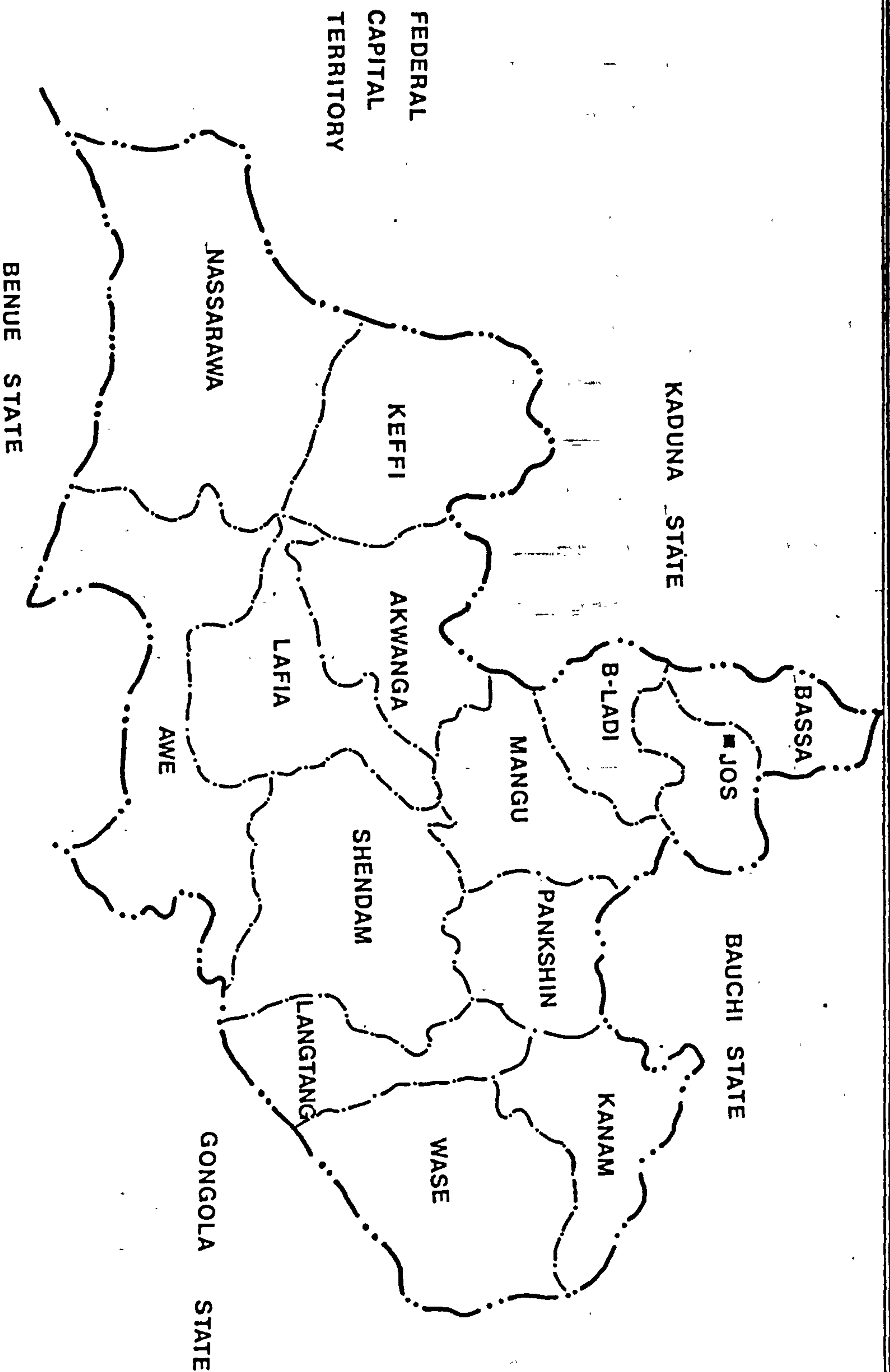
The spatial residential patterns observed in the study areas also reflects the migratory distances travelled by migrant groups.

Kabong and Jenta Adamu areas where a concentration of ethnic groups from Bassa local government area are observed, depicts the reception node of relatively short distance migrants. Tudun Wada study area on the other hand, depicts the reception node of the relatively long distance migrants because of the concentration in the area of ethnic groups from Langtang and Shendam local government areas; while Dadin Kowa study area which shows a large concentration of ethnic groups from Pankshin, Mangu and Barakin Ladi local government areas can be regarded as the reception node of medium distance migrants. In Anglo-Jos however, there is more of ethnic heterogeneity than there is homogeneity. The map overleaf, Map 10, shows the location of the various local government areas vis-a-vis Jos metropolitan area.

The significance of ethnic relationships in determining settlement patterns in the city is also supported by the very low presence in all the areas of single person households and the dominance of large household sizes (of nine or more persons) arising from the presence of dependent relatives.

These ethnic clusterings have a significant effect on the areas of residence since they are likely to enhance the growth of ethnic based community association which serves to perpetuate rural values in the settlements concerned and might hinder or at least slow down individuals' assimilation process to the urban way of life.

Given this kind of residential patterns, typically Turner's patterns are not likely to prevail. Newly arrived migrants, or bridgeheaders appear to fit into already established residential patterns and do not drift to the city centre. This questions seriously the intra-urban mobility aspect of Turner's model.



Scale:- 1 : 1500,000

source : Plateau State Regional Study(1978) Minco Associates

LOCATION OF EMPLOYMENT AND BRIDGEHEADERS IN JOS

In Turner's model, proximity to areas of employment and employment opportunities is regarded as the most important priority in determining migrants (bridgeheaders) settlement patterns. However, Turner assumes that urban employment is primarily concentrated in the city centre. Consequently, bridgeheaders are also concentrated in this area. They cannot afford to pay high transport fares.

More recent studies have made it clear that Turner's assumptions about centrally located employment does not hold any longer even in Latin American cities (Ward, 1982). Industrial establishments are becoming increasingly more peripherally located along major transportation routes and where land can be obtained at a relatively cheap rate. This is true of Jos and other Nigerian cities.

In Jos, the decentralisation of the State Government Secretariat from the the former provincial secretariat to Mountain View area and the growth of Anglo-Jos industrial estate along the Jos-Bukuru road have decentralised employment from the city centre to the periphery. This decentralisation of employment appears to have a significant impact on the growth of some of the areas.

In Anglo-Jos, close to the industrial estate, for example, there is a concentration of factory workers (36.0%) as well as the largest concentration of unemployed respondents (16.0%) in this area. These concentrations coupled with the ethnic heterogeneity observed in the area (mentioned above) would seem to suggest that proximity to Anglo-Jos industrial estate has a significant influence in attracting migrants to the area.

Similarly, Dadin Kowa which is also within close proximity of Anglo-Jos industrial estate showed a concentration of factory workers (19.09%) as well as the second largest concentration of the unemployed respondents (12.9%) of the 101 households interviewed, which would also seem to confirm the influence of Anglo-Jos industrial area in the growth of this settlement.

In the other areas, some occupational concentration has been observed especially in Tudun Wada. The data obtained from this area shows a concentration of the relatively better educated respondents employed largely in the public sector. 34% of the 96 respondents are in this category. Moreover, 33.3% of the respondents in this area are public sector employed labourers. These concentrations may not be unconnected with the area's proximity to both the State and Federal government secretariats.

In Jenta Adamu and Kabong study areas the occupational concentration appears to be less pronounced. In Jenta Adamu area, for example, 38.8% of the respondents are semi-skilled workers employed in all sectors (i.e. public sector, private sector and the self employed sector). This also appears to be the case in Kabong study area where the data indicates that 30.6% of the households interviewed are in the same categories.

Despite these occupational concentrations, it should not however be concluded that the need to be within close proximity of employment areas is the most important factor in determining migrants residential patterns. Indeed in some of the areas it only seems to confirm the dominant role of ethnic relationships in determining settlement patterns.

As Hodder (1957, p.22) rightly observed in the city, occupation is itself structured to a large extent by ethnic grouping. This is because of the unequal distribution of educational facilities within the country and the region in which some areas received much earlier Western education and training as well as the reluctance to accept Western education in some other parts of the region. —

However, in Anglo-Jos where such occupational concentration exists without any significant ethnic concentration, it can be argued that the need to be within close proximity to areas of employment and employment opportunities is a significant factor in attracting newly arrived migrants to the area. This is reinforced by the presence of cheap rental accommodation. The presence of a large proportion of unemployed respondents in both Anglo-Jos and Dadin Kowa would seem to support this argument.

In areas where such occupational concentration exists alongside ethnic concentration (such as in Tudun Wada, Dadin Kowa, Jenta Adamu and Kabong study areas) the influence of kinship relationships cannot be dismissed since migrants of long standing in these areas assist their newly arrived relatives not only in terms of initial accommodation but also help to secure employment for them in their various places of work.

In view of the above findings, it can be said therefore that the data supports Turner's assumption about the need to be within walking distance of employment areas. This is especially so in Anglo-Jos. The situation in the other areas have been complicated by kinship relationships.

RURAL-URBAN MIGRATION AND SOCIAL MOBILITY IN JOS

Turner's model implicitly assumes that the typical rural urban migrant considers the city as the ultimate destination. Return migration is treated by the model as an exception rather than the rule. It follows therefore that the bridgeheaders will be likely to commit themselves strongly to their places of residence and strive to become consolidators by moving up the social hierarchy. The evidence from most of West Africa and indeed the data for this study seem to suggest the contrary.

The data indicates that only 23% or 92 of the 394 respondents regard the city as their ultimate destination. The majority of 68.7% or 271 of the 394 respondents intend to go back to their hometown on or after retirement. Thus, although the average length of stay in the city of migration has probably increased over the years, the commitment of migrants to the city is less marked than the intra-urban mobility model would seem to suggest.

Migrants' commitment to return to their hometown is expressed in many ways including frequent visits to and from the hometown. In other words they maintain strong ties with the village community. They also acquire building land in the rural hometown as opposed to the city.

The result of the survey in Jos shows that only 124 or 31% of the respondents have acquired building land in the city, whereas 267 or 67.8% of the 394 respondents have acquired plots in their rural hometown. These figures if anything, show that migrants to Jos do not strive to consolidate their position in the city as they do to

consolidate their position in the rural hometown. Security of tenure does not seem to rank high in their list of priorities as Turner's intra-urban mobility model would seem to imply. Clearly, the majority of the migrants to the city would seem to prefer investing their savings in building retirement homes than in building in the city to which they have migrated.

The proportion of plots developed by the respondents lend support to the view that consolidation activities is largely directed towards the rural hometown. Of the 124 plots acquired by respondents in the city, only 97 have been fully developed, compared to 138 of 267 that have been developed in the rural hometowns.

Given that the majority of the migrants to the city are temporary migrants as indicated by the data, it would seem that Turner's bridgeheader-consolidator dichotomy has little practical application. The predominantly temporary character of migrants to the city would suggest that bridgeheaders are likely to remain bridgeheaders during their stay in the city and might not reach the consolidator stage since they do not acquire building land in the city.

The fact that consolidation activities among the respondents is largely directed away from the settlement of migration towards the rural hometowns is indicative of how less likely the settlement of migration are to self improvement and also points towards the unlikely success of unquestioning application of the self help housing policy.

OBSERVATION

The results of this analysis shows that contrary to Turner's assumption in which the city centre is perceived as the port of entry for newly arrived migrants, Jos city centre wards perform a relatively insignificant role in providing newly arrived migrants with initial accommodation. The high densities and high rents found in these areas makes the inner city less attractive to newly arrived migrants. The continued growth of industrial establishments on the periphery of the city has also decentralised employment opportunities.

While the inner city wards have become less attractive, mainly for the reasons outlined above the peripherally unauthorised settlements have become increasingly attractive to newly arrived migrants partly because of the relatively cheap rental accommodation they offer and partly because friends and relatives who offer initial accommodation free are largely found in these areas. The proximity of some of these settlements to the peripherally located employment areas also appears to have some effect in attracting migrants to the uncontrolled subareas.

Whereas Turner's model seems to emphasise the need for employment as the highest priority for most newly arrived migrants, the result of the analysis undertaken in this chapter shows that the location of friends and relatives and the assistance which they offer is more likely to influence migrant decisions. The occupational concentration amidst ethnic concentration found in most of the area manifests the influence of friends and relatives on the settlement of the newly arrived migrants. While the occupational concentration without

a corresponding ethnic concentration observed in Anglo-Jos would seem to indicate the dominant role of employment opportunities in attracting migrants to the area.

On the main therefore it can be said that newly arrived migrants to Jos move to specific parts of the city where they join people with the same ethnic or regional background. They do not drift to the city centre or areas of employment, instead they seem to fit established residential patterns. Given the resultant ethnic and regional clustering observed in most of the areas, it seems unlikely that such social stratification as employed in Turner's model would be found in these areas. Such stratifications are likely to be cross-cut by the more dominant ethnic stratification.

The data also suggests that contrary to the assumption that the city of migration is the ultimate destination, migrants to the city are largely temporary. It is not likely that those respondents who regard their stay in the city as temporary would strive to become consolidators. Indeed, the data suggests that consolidator's activities are directed largely towards the rural hometown. Bridgeheaders within this context are likely to remain bridgeheaders while in the city.

CHAPTER FIVE

DETERMINING LIKELY CONSOLIDATORS FROM PERMANENT AND TEMPORARY MIGRANTS

The results of the analysis undertaken in the last chapter shows that not all the respondents (rural-urban migrants) regard the city as their ultimate destination. Indeed, the data indicates that a large majority of the respondents intend to retire in their rural hometowns. These varying migratory intentions would seem to suggest that not all the bridgeheader population would aspire to become consolidators in the city of migration as suggested by Turner's formulation.

In this chapter of the study, an attempt is made to identify which part of the bridgeheader population is likely to consolidate in the city since it is hypothesised in the study that varying migratory characteristics could influence the propensity to consolidate in the city in a way that only the permanent migrants are likely to become consolidators.

The above proposition obviously assumes that there is a significant difference between the permanent and temporary migrants in terms of their housing needs and housing ambitions and hence in their propensity to become consolidators in the city. Following from the above assumption it is also supposed that the necessity of settling in an uncontrolled subarea arises differently according to their felt housing needs and ambitions.

Taking plot ownership in city of migration and plot ownership in the hometown as an indication of the attempt to consolidate either

in the hometown or in the city of migration, it is possible to identify which part of the bridgeheader population have the propensity to consolidate in the city. Similarly, by analysing the reasons for settling in an uncontrolled subarea in relation to the respondent's migratory tendency, it is possible to establish whether or not the necessity of inhabiting an uncontrolled settlement arose from the need to consolidate in the city.

The statistical procedure Chi-square test has been adopted for the purpose of testing the above proposition. The tests are conducted on the basis of the dichotomy permanent and temporary migrants. However, prior to the analysis it is pertinent to comprehend some of the basic principles of the Chi-square test procedure.

THE CHI-SQUARE TEST

The chi-square test is a statistical procedure whose purpose is to test the difference (association) between sampled population in terms of certain attributes expressed in frequency form. The test is based on what is often termed the 'null hypothesis' which supposes or hypothesises that there is no significant difference between a sampled population in respect to the characteristics under consideration and therefore there should be no significant difference in the frequency distribution of the sampled population along the categories of attributes being examined.

Thus, in this study for example, one of the null hypotheses would be that there is no significant difference between those

respondents who acquire development land in the city of migration (i.e the propensity to consolidate in the city) and those respondents who do not in terms of their intended length of stay in the city. In other words, the detection of a significant difference between the two groups would imply that plot ownership in the city of migration is associated with a particular group. Hence it is usual practice in chi-square tests to state an alternative hypothesis which in this case is that plot ownership in the city of migration is associated with permanent migration.

The region of rejection of the null hypothesis in favour of the alternative hypothesis consists of all the values of chi-square which are so large that the probability associated with their occurrence is equal to or less than 0.05. Since the alternative hypothesis given above predicts the direction of the association within the groups, the region of rejection is one-tailed.

SYNOPSIS OF THE PROCEDURE - CHI-SQUARE TEST

The chi-square value (x^2) i.e. the measure of association, is calculated according to a special formula depending on the nature of the data. In a 2 x 2 contingency table, the x^2 value is calculated by:-

$$x^2 = \frac{n(AD - BC/- n/2)^2}{(A+B)(C+D)(A+C)(B+D)} \quad (1)$$

where: n = the total number of respondents in the sample

A, B, C and D = the frequency value in each of the cells
of the table

/AD - BC/ refers to the absolute value of the difference
between A times D and B times C.

When the contingency table is greater than 2 x 2 as in Table 1 below the χ^2 value is calculated By:

$$\chi^2 = \sum_{i=1}^Y \sum_{j=1}^k \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \tag{2}$$

where: O_{ij} = Observed number of cases categorised in the i th row of the column

E_{ij} = Number of cases expected under 'null hypothesis' to be categorised in the i th row of j th column

$\sum_{i=1}^Y$ = the summation of rows (i)

$\sum_{j=1}^k$ = the summation of column (j)

TABLE 1. EXAMPLE OF A CONTINGENCY TABLE

k.

Y	j=1	j=2	j=3	ROW TOTAL
i=1	120 107.5	121 98.68	29 63.7	270
i=2	37 49.4	23 45.31	64 29.26	124
COLUMN TOTAL	157	144	93	394

N = 394

It can be seen from equation (2) above the chi-square test is based on the difference between the observed and expected cell counts.

The procedure assumes firstly, that only the sample size N (see Table 1) is fixed by design. Using the observed frequency distribution, a corresponding table of expected frequency distribution under the null hypothesis can be calculated and the two compared.

The expected values are calculated for each of the cells by multiplying the column total by the row total and dividing the product by the sample size or sample total, i.e.

$$\frac{\text{Column total (K) X Row total (Y)}}{\text{Sample total (N)}}$$

The expected values for the observed cell frequencies in table 1 and for subsequent tables are shown in italics.

If the O_{ij} (the observed values) are in close agreement with E_{ij} (the expected values) the difference $(O_{ij} - E_{ij})$ will obviously be small leading to a small x^2 value. A small x^2 value validates the null hypothesis i.e. the sets of characteristics under examination are independent of each other. Hence, the larger the x^2 value the more likely it is that the groups vary in respect to the classification.

Seigal (1965), Cochran (1954) and Ebdon (1978) suggest that the procedure is applicable to data in a contingency table only if the expected cell frequencies are sufficiently large. Many authors including Seigal (1956) have recommended the use of the technique if none of the expected cell frequencies is not less than 5, where the sample size is between 20 and 40.

On contingency tables with large degrees of freedom (i.e. more than 1) the test may be employed if not more than 20% of the cells have

expected cell frequencies of less than 5 and if none of the cells have expected frequencies of less than 1 (Seigal, 1956).

The proof of the chi-square test is not undertaken in this study. Suffice perhaps to note that Cochran (1954) observed that the proof is strictly valid only as a limiting result when the value of E_{ij} tends to infinity.

Having examined the data for this study and satisfied that it has met all the requirements of the test in its original form, the χ^2 values were calculated using the computer which provides not only the χ^2 value for each set of tables but also the corresponding degrees of freedom, from which the significance of the χ^2 value is checked by reference to the table of chi-square values, presented in Appendix III.

The degrees of freedom for each contingency table is given by the number of rows in the table minus one, multiplied by the number of columns minus one; which reflects the number of observations that are free to vary subject to the restriction imposed by the organisation of the data.

The Significance of the χ^2 value only indicates the likelihood of there being some difference or correlation in the sampled population. It does not signify the magnitude of the difference or correlation, only its remarkability. For example, permitting for 5% chances of error, the χ^2 value required for significance with 1 degree of freedom is 3.84. Thus if the calculated χ^2 value for such a contingency table is greater than the critical value (3.84), then such a result would imply that there is a significant difference in the data and that the difference is not likely

to have occurred due to chance in the sampling procedure. It is more likely to reflect a 'real' difference in the population under study.

The chi-square test has been employed for the purpose of this analysis because the aim of the study is to examine if a pattern of relationship can be established from the two migratory patterns observed in the previous analysis. Thus the aim of the analysis is to establish the existence of a pattern of association and not the extent of the association. This objective corresponds with the functions of the chi-square test. Moreover, the nature of the data, collected for this study, which is largely in discrete categories, (nominal) does not lend itself to parametric analysis without unrealistic assumptions regarding the underlying distribution of responses. The chi-square test being a non-parametric technique is suited for analysing the data.

TEST OF ASSOCIATION BETWEEN PLOT OWNERSHIP IN THE CITY AND THE PROPENSITY TO STAY PERMANENTLY IN THE CITY

Table 2 below shows the joint frequency distribution of the 394 respondents in terms of plot ownership in the city of migration and intended length of stay in the city. The result of the chi-square test shows a computed χ^2 value of 80.72 with 2 degrees of freedom.

The null hypothesis in this test is that there is no significant difference between those respondents who have acquired plot in the city and those who have not in terms of their intended length of stay in the city. While the alternative hypothesis is that only those respondents who intend an indefinite stay in the city are inclined to acquire plots of land for housing.

TABLE 2

PLOT OWNERSHIP IN THE CITY BY INTENDED LENGTH OF STAY IN THE CITY

PLOT OWNERSHIP CATEGORIES	INTEND: PERMANENT STAY?			ROW TOTAL
	DON'T KNOW	NO	YES	
NO PLOT IN CITY	120 107.58	121 98.68	29 63.73	270
HAVE PLOT IN CITY	37 49.41	23 45.31	64 29.26	124
COLUMN TOTAL	157	144	93	394

CHI-SQUARE = 80.72 with 2 degrees of freedom.

It can be seen from the above table that the observed and the expected frequencies are not in agreement. The critical χ^2 value required for significance with 2 degrees of freedom at 5% error chances is given by the table as 5.99. Thus the computed χ^2 value indicates a significant association (beyond 0.001) between plot ownership in the city and permanent migration.

Indeed this pattern of association is well expressed in the Contingency table above. The table shows that 64 or 68% of the 124 respondents who have acquired plots in the city intend a permanent stay compared to only 23 or 16% of those who do not. On the other hand, 44.8% or 121 of the 270 respondents who have not acquired plots of land

in the city do not intend a permanent stay in the city compared to only 29 or 10.7% who intend to stay permanently in the city but have not acquired a piece of land.

The highly significant χ^2 value computed by the test suggests that this distributional pattern is unlikely to be due to chance in the sampling procedure and, therefore, represents an association between plot ownership in the city and permanent migration.

The Contingency table shows that a large proportion of the respondents are in the don't know category. This may be because a significant proportion of the sampled population are public sector employees who are liable to be transferred out of the city to any part of the state at any time. The public sector employees are therefore, less stable than their private sector counterparts and more likely to be in the don't know category.

This apparently large proportion of respondents in the don't know category does not imply that the respondents are in doubt about their migratory status. Analysis of the relationship between plot ownership in the city by intended retirement area shows that while a large majority of respondents don't know if they would permanently stay in the city, they appear not to be in doubt as to their retirement areas.

Table 3 below shows the results of the test of association between plot ownership in the city and retirement area which indicates a significant reduction in the proportion of respondents in the don't know category observed in Table 2. The missing observation refers to locally born population.

The null hypothesis under test here is that there is not significant difference between those respondents who have acquired plots in Jos and those who have not in terms of their intended retirement areas. The alternative hypothesis is that those who acquire plots in the city do not intend to retire in their rural hometown.

TABLE 3 PLOT OWNERSHIP IN THE CITY BY INTENDED RETIREMENT IN THE
HOMETOWN

RETIRE IN HOMETOWN?				
ACQUIRE PLOT IN CITY?	DON'T KNOW	NO	YES	ROW TOTAL
NO	45 55.77	20 42.36	204 170.86	269
YES	34 23.22	40 17.63	38 71.13	112
COLUMN TOTAL	79	60	242	381

CHI-SQUARE = 69.10 with 2 degrees of freedom.

MISSING OBSERVATIONS = 13.

As expected from the apparently large variation between the observed and the expected values the result of the test shows a significantly large χ^2 value (69.10 with 2 degrees of freedom). Allowing for the already specified 5% chances of error within the given degrees of freedom, the table of critical χ^2 values indicates that there is a significant difference beyond 0.001 level between those respondents who acquire plots in the city and those who do not in terms of their preferred retirement area.

The pattern of association can be observed from the Contingency table which shows that only 15% or 38 of the 242 respondents who intend to retire in their hometowns have acquired plots in the city. A large majority of the respondents who intend to retire in their hometowns 84.2% have not acquired plots of land in the city. On the other hand, a large majority of those respondents who have acquired plots in the city do not intend to retire in their hometown. This distributional pattern would seem to suggest that plot acquisition in the city of migration is associated with those respondents who do not intend to retire in their hometowns. This finding also confirms the results of the test of association between plot ownership in the city and permanent stay in the city which indicates that plot acquisition in the city is more closely associated with permanent migrants.

Implied in the hypothesis being tested in this chapter is the assumption that temporary migrants might be attracted towards rented accommodation since they are not likely to consolidate in the city. It is expected therefore that a chi-square test of joint frequency distribution of the reasons for living in an uncontrolled subarea by intended length of stay in the city would reflect this bias.

TEST OF ASSOCIATION BETWEEN PERMANENT MIGRATION AND REASON FOR
INHABITING AN UNCONTROLLED SUBAREA IN JOS

The null hypothesis under test in this section is that there is no difference between those migrants who intend a permanent stay and those who do not in their reasons for living in an uncontrolled subarea. This can be seen within Turner's formulation which assumes that all the growth of uncontrolled settlements are a manifestation of the overwhelming desire of the inhabitants to build their own houses. The alternative hypothesis however, is that there is a significant difference between the migrants in their reasons for inhabiting an uncontrolled settlement in which only the permanent migrants move for the purpose of building their own houses.

Table 4 below shows the result of the test in which a χ^2 value of 100.64 with 6 degrees of freedom was realised. The required chi-square value for significance with 6 degrees of freedom and 5% chances of error is given as 12.59. This implies that the computed χ^2 value is significant beyond 0.001 and therefore there is a significant variation between the two migrant groups in their reasons for staying in the study areas. It also implies that the difference is not likely to be due to chance but rather more likely to be representative of the sampled population. In other words it is safe to reject the null hypothesis in favour of the alternative hypothesis.

The distributional pattern of responses in the Contingency table supports the alternative hypothesis. The data shows that 54.7% of the 106 respondents whose reason for staying in one of the study areas is to build their own houses are those who intend a permanent stay in

TABLE 4 INTENDED LENGTH OF STAY IN THE CITY BY REASON FOR STAYING
IN AN UNCONTROLLED SETTLEMENT

PERMANENT STAY?	OTHERS	CHEAP RENT	RELATIVES	HOUSE OWNERSHIP	ROW TOTAL
DONT 'T KNOW	53 38.65	50 53.39	24 22.71	30 42.23	157
NO	30 35.34	76 49.97	20 20.83	18 38.74	144
YES	14 22.89	8 31.62	13 13.45	58 25.02	93
COLUMN TOTAL	97	134	57	106	394

CHI-SQUARE = 100.64 with 6 degrees of freedom.

the city, compared to only 16.9% of those who do not intend an indefinite stay in the city. The data also shows that a large majority of the respondents who do not intend a permanent stay in the city (52.7%) gave the benefit of cheap rental accommodation as their reason for staying in the area compared to only 8.6% of those who intend a permanent stay in the city. In other words, 56.7% of the 134 respondents whose reasons for staying in the area is to benefit from cheap rental accommodation do not intend a permanent stay while only 5.9% of those who intend a permanent stay in the city gave this as their reason for staying in the area.

The pattern shows quite clearly that permanent migrants are more closely associated with the tendency to consolidate in the city of

migration. The distribution of the joint frequency of responses in terms of intended length of stay in the city and type of housing occupancy, Table 5 below, seems to support this argument.

TABLE 5 INTENDED LENGTH OF STAY IN THE CITY BY TYPE OF ACCOMMODATION

INTEND PERMANENT STAY?	RENTED ACCOMM.	FRIENDS/ RELATIVES	OWN HOUSE	ROW TOTAL
DONT'T KNOW	92 82.48	38 31.47	27 43.03	157
NO	101 75.65	24 28.87	19 39.47	144
YES	14 48.86	17 18.64	62 25.49	93
COLUMN TOTAL	207	79	108	394

CHI-SQUARE = 105.65 with 4 degrees of freedom

The data in Table 5, which includes not only the migrants but also the locally born population shows that 57.4% of the 108 respondents in owner occupation intend a permanent stay in the city compared to only 17.6% of those who do not intend a permanent stay in the city. It also shows that of the 207 respondents in rented accommodation only 6.8% intend a permanent stay compared to 48.8% who do not intend a permanent stay. Similarly, only 21.5% of those who intend to stay permanently live with friends and relatives compared to 30.4% of those who do not intend an indefinite stay. Yet the computed χ^2 value of 105.65 with 4 degrees of freedom would seem to suggest that the association in the pattern produced in the table is not due to chance.

The rationale behind this apparant preference for cheap rented accommodation and/or living with friends and relatives on the part of those not committed to a permanent stay in the city as Sofier (1973) and Peil (1976) rightly noted, is to enable savings to be made towards building retirement homes in the hometown. This implies that consolidation for this group of people is a thing for the hometown and not the city.

The above proposition appears to be verified in Table 6 below, which shows the joint frequency of responses in terms of plot ownership in the hometown and the propensity to retire in the hometown.

TABLE 6

PLOT OWNERSHIP IN THE HOMETOWN BY INTENDED RETIREMENT
IN HOMETOWN

OWN PLOT OF LAND IN HOMETOWN	RETIRE IN HOMETOWN?			
	DON'T KNOW	NO	YES	ROW TOTAL
NO PLOT IN HOMETOWN	30 22.80	36 17.32	44 69.86	110
HAVE PLOT IN HOMETOWN	49 56.19	24 42.67	198 172.13	271
COLUMN TOTAL	79	60	242	381

CHI-SQUARE = 44.96 with 2 degrees of freedom

Number of missing observations = 13

The Contingency table shows that 81.8% of the 242 respondents who intend to retire in their hometown have acquired plots for building retirement homes compared to only 44 or 18.2% of those who have acquired plots in the hometown but do not intend to retire there. In other words, 73.1% of the 271 respondents who have acquired plots in the hometown are those who intend to retire there, compared to only 40% of the 110 respondents who don't intend to retire in the hometown but have acquired plots. Similarly, 60.0% of the respondents who do not intend to retire in the hometown have not acquired plots compared to only 40% of those who intend to retire in their hometown but have not acquired plots. This pattern^{of} responses would seem to indicate an association between plot ownership in the hometown and the propensity to retire in the hometown. Yet the computed χ^2 value of 49.96 with 2 degrees of freedom does indicate that the observed pattern is representative of the sample population.

The analysis of the joint frequency distribution of responses in terms of intended length of stay in the city and plot ownership in the hometown presented in Table 7 also supports the findings of the above test. The null Hypothesis here is that there is no significant difference between those respondents who intend a permanent stay in the city and those who do not in terms of plot ownership in the rural hometowns. The alternative hypothesis, however, is that those who do not intend a permanent stay in the city are more inclined to own plots in the hometown.

TABLE 7
INTENDED LENGIH OF STAY IN THE CITY BY PLOT OWNERSHIP
IN THE HOMETOWN

PLOT IN HOMETOWN			
INTEND PERMANENT STAY	NO	YES	ROW TOTAL
DON'T KNOW	43 45.32	114 111.67	157
NO	26 41.57	118 102.42	144
YES	41 23.09	39 56.90	80
COLUMN TOTAL	110	271	381

CHI-SQUARE = 27.88 with 2 degrees of freedom

Number of missing observations 13

The data shows that 43.5% of the respondents who have acquired plots in the hometown do not intend a permanent stay in the city compared to only 14.4% acquired by those who intend a permanent stay in the city. It can also be observed from the table that 72.6% of the 157 respondents in the don't know category have acquired plots in their hometown. This represents about 42.1% of the plots acquired in the hometown.

However, the above results indicate quite clearly as indeed supported by the significant large χ^2 value of 27.88 with 2 degrees of freedom that plot ownership in the hometown is associated with those respondents who do not intend to stay indefinitely in the city or (as shown in Table 6) those who intend to retire in their hometown.

A BRIEF DISCUSSION OF THE RESULTS

If plot ownership amongst the respondents is accepted as an indication of the propensity to consolidate either in the rural hometown or the city of migration, then the significant association observed in the distribution patterns of response in Table 2 between plot-ownership in the city of migration and intended permanent stay in the city of migration implies that the propensity to consolidate in the city is not common to all migrant groups but only to permanent migrants.

Although the data shows that migrants not committed to a permanent stay in the city are observed to have acquired some plots in the city, the rather large computed χ^2 value attributed to this distributional pattern would suggest that the temporary migrants in this category are statistically insignificant. Peil (1976) observed a similar pattern in which some temporary migrants have acquired plots in the city of migration, but rightly pointed out that most of such plots are subsequently developed for rental purposes. They are thus regarded as an investment and therefore fall within a different category.

The proposition that only permanent migrants strive to become consolidated in the city is supported by the pattern of association observed in Table 3 in which plot acquisition in the city is more closely associated with those respondents who do not intend to retire in their hometowns as well as in Table 4 which tested the variation in the reason for staying in an uncontrolled subarea.

The results of the analysis in Table 4 shows quite clearly that the

reason for inhabiting an uncontrolled subarea varies between the two migrant groups - and supports the proposition that only the permanent migrants regard their stay in these areas as a consolidation process. The majority, as the data suggests, especially those who intend to retire in their hometown, the main attraction is the cheap rented accommodation that can be found in these areas. This also implies that not all the houses in the uncontrolled areas are self built homes. The apparently large number of the respondents observed in rented accommodation and the correspondingly low proportion of respondents in owner occupation indicates that a large proportion of the housing in the study areas are rented accommodation. This pattern is observed in Table 5.

The extent of the individual commitment to retire in the hometown on the part of those respondents who do not intend a permanent stay in the city can be observed in the number of plots acquired in the rural hometown, analysed in Table 6. This also indicates the rationale behind their preference for cheap rented accommodation as well as the reason why they are less likely to become consolidators in the city. The significant association observed between plot ownership in the hometown and the propensity to retire in the hometowns also indicate that not all the migrants or indeed the inhabitants of these areas can be expected to consolidate in the city. It shows clearly that for the temporary migrants the city is perceived as a transit point and the choice of settlement in the city is not as a result of the desire to gain a foothold in the city but as a means towards gaining a foothold in the hometown. The results of the analysis in Table 7 provides further support for this argument.

CONCLUSION

The results of the analysis undertaken in this chapter shows that, contrary to Turner's assumption, not all the bridgeheader population strive to become consolidators. The data suggests that far from Turner's ideal uncontrolled settlement populated largely by consolidators and improving in-situ, the settlements in Jos are dominated by temporary migrants who strive not to consolidate in the city but in the rural hometown.

The results of the analysis shows that the propensity to consolidate in the settlement of migration is associated only with those migrants who intend a permanent stay in the city. Yet this group of respondents constitute only a minority. It is not likely therefore that security of tenure would rank high in the priority order of the majority of the people. The areas are therefore not likely to improve in situ.

CHAPTER SIX

STATISTICAL DEPENDENCY RELATIONSHIP BETWEEN PLOT OWNERSHIP, IN JOS, MIGRATORY PATTERN AND RECEPTION NODE IN THE CITY

This chapter attempts to test the effects of varying migratory patterns and settlement patterns on the growth processes of the five study areas. The statistical dependency model, Log-linear model, has been selected for this purpose.

The log-linear model can be considered as an extension of the χ^2 analysis of contingency tables (undertaken in the previous chapter) whereas χ^2 analysis is applicable to two-dimensional contingency table as in table 8 which tested associated between intended length of stay in the city and plot ownership in the hometown. It is not possible to consider three or more dimensions of a contingency table using χ^2 but it is possible to analyse association in 2, 3 or more higher dimensional contingency table using log-linear model.

SOME BASIC PRINCIPLES OF THE LOG-LINEAR MODEL

The Log-linear model is based on the principle of modelling the expected cell frequencies of a contingency table as a function of parameters which depict the impact of the categorical variables defining the dimensions of the table. By obtaining the natural logarithm of the expected cell frequencies, a linear model can be derived. This linear model is what is commonly known as the log-linear model.

In this study for example, the aim is to examine the pattern of relationships between migrants propensity to engage in self-help housing, type of migration (in terms of whether the respondents regard their stay as temporary or permanent) and migrants area of residence in the city of migration. The three corresponding variables are plot ownership in the city (PL), respondents intended length of stay in the city (L) and respondents area of residence in the city (A). Let i j k represent the dimensions (i.e. the number of categories) for each of the three variables respectively in which:

1. Plot ownership in the city (PL) has two categories denoted by:

$i = 1$ (No plot in city) for the first category

$i = 2$ (have plot in city) for the second category.

2. Intended length of stay in the city (L) has three categories denoted by:

$j = 1$ (don't know) for the first category

$j = 2$ (not staying permanently) second category

$j = 3$ (Indefinite stay in the city) third category

3. Area of residence in the city (A) ie: five categories of areas that correspond with the five areas under study, denoted by:

$k = 1$ first areal category (Dadin Kowa study area)

$k = 2$ second areal category (Tudun Wada study area)

$k = 3$ third areal category (Kabong study area)

$k = 4$ fourth areal category (Jenta Adamu study area)

$k = 5$ fifth areal category (Anglo-Jos study area).

The observed frequencies of responses of the three variables

may be cross-classified in a three dimensional contingency table of $2 \times 3 \times 5$ i.e. 30 cells, as presented in table 8 overleaf.

Assuming that only the total (N) of the observed frequencies of the table is fixed by design, a corresponding table of cell probabilities or expected cell frequencies could be calculated from the observed cell counts (Fienberg, 1977; Bishop et al (1975), Goodman, (1970, 1972). All expected values are shown in italics.

By modelling the calculated cell frequencies (F_{ijk}) of the tables as a function of parameters (λ) which represent the effects of the categorical variables PL, A and L, a linear model of the logarithm of the expected cell frequencies (F_{ijk}) can be obtained. Thus, the log-linear model is based on the natural logarithm of the expected cell frequencies of a contingency table (Upton, 1978; Wrigley, 1979; Goodman, 1970, 1972; Fienberg, 1977).

The data in Table 1 can be modelled as follows:

$$\text{Log}_o O_{ijk} = \text{Log}_o PL_i + \text{Log}_o A_j + \text{Log}_o L_k - \text{Log}_e N \quad (1)$$

in terms of expected cell frequencies

$$\text{Log}_e F_{ijk} = \text{Log}_e N + \text{Log}_e PL_i + \text{Log}_e A_j + \text{Log}_e L_k \quad (2)$$

Equation (2) is then formulated as a log-linear model, Equation (3) below. The proof of this model is too cumbersome to be undertaken here. But the proof is given by Payne (1977: 109).

PLOT OWNERSHIP LEVEL	AREAL LEVEL (A)														
	K = 1			K = 2			K = 3			K = 4			K = 5		
	LENGTH OF STAY LEVEL (L)			LENGTH OF STAY LEVEL (L)			LENGTH OF STAY LEVEL (L)			LENGTH OF STAY LEVEL (L)			LENGTH OF STAY LEVEL (L)		
(PL)	J = 1	J = 2	J = 3	J = 1	J = 2	J = 3	J = 1	J = 2	J = 3	J = 1	J = 2	J = 3	J = 1	J = 2	J = 3
i = 1	42	17	6	29	45	7	18	30	8	13	16	4	18	13	4
	40.12	17.18	7.697	28.93	44.95	7.121	18.94	29.84	7.227	13.37	16.37	3.258	18.64	12.66	3.696
i = 2	12	4	20	4	4	7	10	9	23	5	4	7	6	2	7
	13.88	3.815	18.30	4.067	4.054	6.879	9.066	9.163	23.77	4.626	3.632	7.742	5.360	2.336	7.304

TABLE 8 THREE WAY CONTINGENCY TABLE, OBSERVED/EXPECTED FREQUENCY DISTRIBUTION OF RESPONSES

PLOT OWNERSHIP (PL), INTENDED LENGTH OF STAY (L) AND AREA OF RESIDENCE (A)

CROSS-CLASSIFIED.

The log-linear model has the form:

$$\text{Log}_e F_{ijk} = \mu + \lambda_i^{PL} + \lambda_j^A + \lambda_k^L \quad (3)$$

in which the μ term as noted by Upton (1978) refers to the overall mean of the expected cell frequencies. λ_i^{PL} is the difference between the overall mean and the mean of the log of expected frequencies in the j cells at (i) of variable PL. It therefore accounts for the main effects of being at level i of variable l .

Similarly, λ_j^A represents the main effect of being at level j of the second variable, and λ_k^L represents the main effect of being at level k of the third variable (L). Since λ_i^{PL} , λ_j^A and λ_k^L terms represent deviation from the overall mean, the following constraints apply.

$$\sum_{i=1}^I \lambda_i^{PL} = \sum_{j=1}^J \lambda_j^A = \sum_{k=1}^K \lambda_k^L = 0 \quad (4)$$

The above constraint refers to the log-linear model of independence or no interaction between the variables. However, the model or hypothesis of no interaction is only one of the forms of the most general log-linear model for contingency tables.

As Bhapkar et al (1978) observed, by adopting a hypothesis of no interaction (or independence) between the variables of the table (i.e. the variables defining the parameters of the log-linear model) a variety of hypotheses can be tested. Moreover, the approach provides a lot of insight into the interpretation of the data. These hypotheses include:

- a) The hypothesis of mutual independence between the variables.
- b) The hypothesis of multiple independence between the variables.
- c) The hypothesis of conditional independence between the variables.
- d) The hypothesis of pairwise association between the variables.
- e) The saturated model hypothesis.

From the above synopsis, it is clear that by adopting the log-linear model, it is possible not only to test specific hypotheses but it also enables an explorative analysis of the data. However, each of the hypotheses listed above are briefly examined below.

1. THE HYPOTHESIS OF MUTUAL INDEPENDENCE

This hypothesis, as implied by the name, states that the variables defining a contingency table for example the data in Table 8 (i.e. plot ownership (PL) intended length of stay in the city (L) and area of residence (A)) are not associated with each other. In other words, they are independent of each other. This hypothesis as might have been observed is analogous to the null hypothesis in a chi-square test. The hypothesis thus, harmonises with the log-linear model.

$$F_{ijk} = \mu + \lambda_i^{PL} + \lambda_j^A + \lambda_k^L \quad (5)$$

in which F_{ijk} represents the natural logarithm of the expected frequencies of the variables in each ijk cell of the contingency table.

μ represents the overall mean of the logarithm of the expected frequencies.

λ_i^{PL} represents the parameters associated with the plot ownership dimension (PL) of categories (i).

λ_j^A represents the parameters accompanying the areal dimension (A) of categories (j)

λ_k^L represents the parameters associated with the length of stay dimension (L) of categories (k).

Under this hypothesis, each expected frequency predicted by the model could be calculated from: for example, Table 1 as:

$$\frac{\text{Plot total} \times \text{area total} \times \text{length of stay total}}{(\text{total migrants})^2} \quad (6)$$

This is a three-way extension of the formula used to calculate expected frequencies in a 2-way or 2-dimensional χ^2 analysis under the null hypothesis of no association between the variables.

2. THE HYPOTHESIS OF MULTIPLE INDEPENDENCE

This hypothesis supposes that two associated variables, examined as a joint variable, are independent of a third variable. For example, the χ^2 test of the previous chapter shows that plot ownership in the city is closely associated with permanent migrants.

The joint effect of these variables can be represented by the parameter,

$\lambda_{i k}^{PL.L}$ Under this hypothesis, it is possible to test whether this association between PL and L is the same for each of the study areas.

Neither PL or L is hypothesised under this model to be associated with respondents area of residence.

The appropriate log-linear model for test

$$F_{ijk} = \mu + \lambda_i^{PL} + \lambda_j^A + \lambda_k^L + \lambda_{i k}^{PL.L} \quad (7)$$

3. THE HYPOTHESIS OF CONDITIONAL INDEPENDENCE

This hypothesis suggests that a pair of variables are independent given a third variable. Thus within this context, it is possible to test the hypothesis that plot ownership (PL) is associated with intended length of stay (L) and assuming that this relationship is the same for each area. Similarly, the hypothesis that intended length of stay (L) is associated with Area (A), and assuming this association is the same for each plot ownership category (PL). But plot ownership (PL) is not associated with area (A).

The hypothesis of conditional independence corresponds to the log-linear model:

$$F_{ijk} = \mu + \lambda_i^{PL} + \lambda_j^A + \lambda_k^L + \lambda_{ik}^{PL.L} + \lambda_{kj}^{L.A} \quad (8)$$

4. THE HYPOTHESIS OF PAIRWISE ASSOCIATION

In this hypothesis, each pair of variables is associated but this association is unaffected by the level of a third variable. Thus, it is possible to test whether there is association say, between plot ownership in the city (PL) and intended length of stay in the city (L) and assuming the association is the same for each areal category. Similarly, we can test for association between intended length of stay (L) and area of residence in the city (A), assuming the association is the same for each plot ownership category.

The pairwise association hypothesis also includes test of

association between plot ownership in the city (PL) and area of residence (A) assuming this association is the same for all intended length of stay categories. The appropriate log-linear model is given as follows:

$$F_{ijk} = \mu + \lambda_i^{PL} + \lambda_j^A + \lambda_k^L + \lambda_{ij}^{PL.A} + \lambda_{jk}^{A.L} + \lambda_{ik}^{PL.L} \quad (9)$$

5. SATURATED MODEL HYPOTHESIS

This model represents the most complicated of all the models in which all the variables included are hypothesised to be interrelated. In this case, the parameter $\lambda_{ijk}^{PL.A.L}$ is added to the pairwise association model in (9) above. This model would normally provide an accurate prediction of the observed frequencies since the effects of all the variables are considered. This model implies that all pairs of variables are associated but the pairwise associations differ over categories of the third variable. The model takes the form:

$$F_{ijk} = \mu + \lambda_i^{PL} + \lambda_j^A + \lambda_k^L + \lambda_{ij}^{PL.A} + \lambda_{jk}^{A.L} + \lambda_{ik}^{PL.L} + \lambda_{ijk}^{PL.A.L} \quad (10)$$

The log-linear modelling of cross-classified categorical data as in the case under study, involves fitting a set of the models outlined above to the observed contingency table of data (eg. Table 1) and the selection of the most acceptable model on the basis of 'goodness of fit' statistics.

In this study, the log-linear model has been applied as a set of hierarchical models. The main feature of the hierarchical model as

noted by Upton (1978) and Wrigley (1979) is that the λ -terms are omitted only in a descending order of dimensionality. In other words, higher order interaction terms are included only if their lower order equivalents are included. For example, the term, $\lambda_{ijk}^{PL.L.A}$ will be included if all pairwise associations are included i.e. $\lambda_{ij}^{PL.A}$, $\lambda_{jk}^{A.L}$ and $\lambda_{ik}^{PL.L}$. The modelling process is thus, additive.

PARAMETER ESTIMATES AND MODEL SELECTION

As mentioned earlier, prior to the selection of a satisfactory model from a set of hierarchical log-linear models, estimated expected cell frequencies values for the various models would be required.

These values, in addition with estimate of the parameters of the models (or contrasts between parameters) and the standard error of the contrasts are required to enable the evaluation of computing models in terms of goodness of fit of their observed and estimated cell values.

The most commonly adopted estimation procedure is the maximum likelihood estimate (MLEs). Birch (1963) has in this respect shown that the MLEs of the expected cell values are functions of the observed marginal totals corresponding to the highest order effect in the log-linear model and how a variety of different sampling schemes give rise to the same maximum likelihood estimates.

Although the MLEs of the expected cell values can be calculated by hand, in most cases an iterative procedure that ultimately leads to the maximum likelihood estimates is employed.

Fienberg (1970: 1977, 33-6) and Bishop et al (1975: 83-93)

described one of such iterative procedures namely; 'The iterative fitting procedure'. The MLEs are obtained through the procedure by constraining the marginal totals of the estimated values to equal the observed marginal totals corresponding to the highest order effect of each of the variables in the model. The procedure is essentially a cyclic ascent optimisation process.

One other procedure is 'the iterative weighted least square' described by Nelder and Wedderburn (1972) through which MLEs may be obtained in a wide range of general linear models. The computer programme called GLIM (Generalised Linear Iterative Modelling) which makes possible the estimation of log-linear model, is one of the options available under this procedure.

The iterative weighted least square procedure has the advantage of providing the variance-covariance matrix (and thus the standard errors) of the parameter contrasts exactly, whereas, the proportional fitting procedure does not provide such a matrix.

However, it should be mentioned here that the major interactions of importance do not themselves provide a test of their importance. Their importance, as Upton (1981) rightly pointed out, depends upon which other interactions have been included in the model. Thus, the conditional test of an interaction is obtained by comparing the goodness of fit of two models. It is the value of the scaled deviance (Y^2) or the proportion of unexplained variation for the two models that must be compared.

For example, comparing the mutual independence and multiple independence models, equation (5) and (7) respectively, to test the significance of association between plot ownership (PL) and intended length of stay (L) as re-presented by the parameter $\lambda_{i k}^{PL.L}$. Since a second model e.g. model (7) is likely to contain more parameters than a first model e.g. model (5), it is more certain to fit the data better and give a smaller value of χ^2 .

Given that χ^2 has a χ^2 distribution in both cases, though with more 'degrees of freedom' (for the second model), the difference in the two values of χ^2 also has a χ^2 distribution, and therefore provides a test of the importance of the first parameter conditional on the second having been included in the model.

TESTS OF RELATIONSHIP BETWEEN PLOT OWNERSHIP IN JOS, PROPENSITY TO STAY PERMANENTLY IN THE CITY, AND AREA OF RESIDENCE IN THE CITY.

Table 9 shows the results of the analysis of the data presented in Table 1. The data was analysed using the computer package GLIM which provided not only the χ^2 values but also the appropriate degrees of freedom from which the conditional importance of the parameters were tested. The models tested include: the mutual independence hypothesis, the multiple independence hypothesis, the conditional independence hypothesis, the pairwise association hypothesis and the saturated model hypothesis.

The purpose of this analysis as mentioned earlier, is to identify if any simple and yet meaningful relationship exists between plot ownership in the city, type of migration and respondents area of residence in the city, since the study hypothesised that varying migratory patterns

lead to different housing needs and ambitions which in turn affect the areas of residence in the city of migration.

MODEL SELECTION

Model 1 in Table 9 shows the results of the test for mutual independence hypothesis: Models 2, 3 and 4 present the results of the test for multiple independence, Models 5, 6 and 7 the results of the test for conditional independence, Model 8, the result of the test for pairwise association and model 9, the result of the saturated model hypothesis. The parameters generated by each of the above models are given in Appendix IV.

The results shown in model 1 (test of mutual independence) which gave a χ^2 value of 120.7 with 22 degrees of freedom (see also Table 1 of Appendix IV) thus provides the 'yardstick' or 'the Baseline value' from which the conditional importance of the parameters of the succeeding models can be tested. The χ^2 value represents the proportion of unexplained variation by the parameters of the model. Therefore any of the succeeding models that provides the least χ^2 value or proportion of unexplained variation would obviously be the best fit model (i.e the model that fits the data best). The data should therefore be interpreted within the context of that model. The degrees of freedom here, as in the chi-square tests, represent the number of observations that are free to vary subject to the restrictions imposed by the organisation of the data.

The test for multiple independence as shown by the results in models 2, 3 and 4 of Table 9 (summarised from Tables 2, 3 and 4, of

Appendix IV) indicates that there is a significant factor response interaction between plot ownership in the city (PL) and respondents area of residence in the city (A). It also shows in model 4, that there is a significant interaction between residential area (A) and intended length of stay in the city (L).

While the results show that the above mentioned interactions are significant beyond 0.001 level, the most significant interaction however, is the interaction between plot ownership in the city (PL) and respondents intended length of stay in the city (L). The χ^2 value of 43.29 with 20 degrees of freedom in model 3 Table 9 (see also Table 3, Appendix IV) represents a reduction of 77.43 with 2 degrees of freedom from the Baseline value of 120.7 with 22 degrees of freedom obtained in model 1, i.e. mutual independence. This interaction is also significant beyond 0.001 level. This significant interaction also confirms the pattern of association between plot ownership in the city and intended length of stay in the chi-square test of the previous chapter.

The test for conditional independence between the variables, results of which are presented in models 5, 6 and 7 (see also Tables 5, 6 and 7, Appendix IV) indicates that the interaction with the strongest association is A.L model 5 (i.e. Table 5, Appendix IV) which reduced the χ^2 value from 43.27 with 20 degrees of freedom (observed in model 3) to 13.09 with 12 degrees of freedom. This interaction is significant beyond 0.001 level. It represents a reduction of 30.17.

The test of pairwise association between the variables (model 8, also Table 8, Appendix IV) shows a further reduction in the χ^2 value to

TABLE 9 TESTS OF ASSOCIATION BETWEEN PLOT OWNERSHIP IN THE CITY, PERMANENT MIGRATION AND AREA OF RESIDENCE

MODEL	DEFINING SET	χ^2	DF	$\chi^2 - \chi^2$	DIFFERENCE DF	PARAMETER TESTED	RESULT OF TEST
1	PL + A + L	120.7	22				
2	PL + A + L + PL.A	101.5	18	19.2	4	PL.A	significant beyond 0.001
3	PL + A + L + PL.L	43.27	20	77.43	2	PL.L	significant beyond 0.001
4	PL + A + L + A.L	90.61	14	30.09	8	A.L	significant beyond 0.001
5	PL + A + L + PL.L + A.L	13.10	12			A.L	significant beyond 0.001
6	PL + A + L + A.L + PL.A	71.45	10			PL.A	significant beyond 0.001
7	PL + A + L + PL.L + PL.A	24.11	16			PL.A	significant beyond 0.001
8	PL + A + L + PL.L + PL.A + A.L	1.687	8				significant beyond 0.001
9	PL + A + L + PL.L + PL.A + A.L + PL.AL	0	0				NOT SIGNIFICANT

1.687 with 8 degrees of freedom indicating a strong pairwise association PL.L + A.L + PL.A. This pairwise association is also significant beyond 0.001 level.

However, the saturated model failed to identify a significant three-way interaction between the variables. Indeed, the rather low χ^2 value (1.687) and the rather high degrees of freedom (8) observed in the pairwise interaction above is itself indicative of the lack of a significant 3-way association between the variables. The saturated model as mentioned earlier, implies that all the parameters involved are included in the model hence the degree of freedom equals zero. Given the proportion of unexplained variation in the pairwise association, a significant interaction within the three-way context is very unlikely. It should also be noted that even if a less stringent significance level were to be adopted the saturated model interaction would remain insignificant.

In view of the above results, it is evident that the pairwise association model fits the data best. This argument is supported by the significantly large reduction in the χ^2 value attributed to the three interactions. The data would therefore be better explained within the context of pairwise association between the variables.

The hierarchical nature of the log-linear model can be observed in the above application of the model from the significant reduction in the χ^2 value attributed to the interaction PL.L from model 3 test of multiple independence, which reduced the χ^2 value from the 'baseline value' of 120.7 in model 1 to 43.27. The next strongest association being A.L from conditional independence model (5) which reduced the χ^2 value from 43.27 to 13.10 and finally, the

strong pairwise association $PL.L + A.L + PL.A$ which reduced further the χ^2 value to a mere 1.687.

INTERPRETATION OF THE BEST FIT MODEL: PAIRWISE ASSOCIATION MODEL

Having examined the models analysed and established that the pairwise association model provides the best fit for the data in Table 8, it is appropriate to comprehend the nature of the association or the interaction terms implied in the model. The interpretation of the model is expressed in terms of both the original data and the estimated values of the parameters which provides more accurate information. The data in Table 8 have also been represented to illustrate the underlying patterns of association.

The pairwise association here implies three types of association since only three interaction terms were included in the model. Firstly, it implies that there is a significant association between plot ownership in the city (PL) and area of residence in the city (A) but that this association is independent of intended length of stay categories (L). Secondly, it implies that there is a significant association between plot ownership in the city and intended length of stay in the city, but that this association is independent of categories of residential areas. Thirdly, it also implies a significant association between intended length of stay in the city and residential area, but this relationship is independent of plot ownership categories. Each of these associations is considered in turn.

THE ASSOCIATION BETWEEN PLOT OWNERSHIP AND AREA OF RESIDENCE IS INDEPENDENT
OF INTENDED LENGTH OF STAY CATEGORIES

This pattern of association would seem to suggest that the association between plot ownership in the city and residential area occurs irrespective of the intended length of stay of the respondents in the city. Table 10 below which cross-classified the data in Table 1 in terms of the relationship between plot ownership and area of residence by length of stay categories illustrates more clearly what the model is trying to point out.

The table shows that the distributional pattern of responses along the first two length of stay categories (i.e. Don't know and No) are similar, in which a large majority of the respondents within these categories (for all the five areas) are in the first plot ownership category (i.e. No plot in the city). However, this pattern differs from that of the third length of stay category (intended permanent stay category) in which the majority of respondents within this category, for all the areas, are within the second plot ownership category (i.e. have plot in the city).

This variation in the distributional pattern of responses along the length of stay categories would seem to suggest that the association between plot ownership and residential area is dependent on the third length of stay category (i.e. permanent stay) since the majority of respondents in this category (for all areas) have acquired plots in the city. This would imply a three-way interaction between the variables. However, the strong pairwise association observed earlier, as opposed to a three-way interaction implies that the difference in the distributional pattern observed in Table 10 is statistically insignificant to provoke a three-way interaction. It is therefore more likely to have occurred due to chance in the sampling process.

TABLE 10 OBSERVED/EXPECTED FREQUENCIES, PLOT OWNERSHIP IN THE CITY, AREA OF RESIDENCE AND INTENDED LENGTH OF STAY IN THE CITY CROSS CLASSIFIED

		LEVEL (L)														
		LENGTH OF STAY					NO-CATEGORY (2)									
		DON'T KNOW CATEGORY (1)					PERMANENT STAY CATEGORY (3)									
		AREA														
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
NO PLOT IN CITY	42	29	18	13	18	17	45	30	16	13	6	7	8	4	4	
	40.12	28.93	18.94	13.37	18.64	17.18	44.95	29.84	16.37	12.66	7.697	7.121	7.227	3.258	3.696	
HAVE PLOT IN CITY	12	4	10	5	6	4	4	9	4	2	20	7	23	7	7	
	13.88	4.067	9.064	4.626	5.36	3.815	4.054	9.163	3.632	2.336	18.30	6.879	23.77	7.742	7.304	

Thus, although the table of raw data (Table 8) shows that 86 of the 93 respondents who intend a permanent stay in the city have acquired plots in the city, this apparent association between plot ownership in the city and intended length of stay in the city does not affect the relationship between plot ownership and area of residence. In other words, there is a significant association between plot ownership in the city and intended length of stay but this association is independent of area of residence.

THE ASSOCIATION BETWEEN PLOT OWNERSHIP IN THE CITY AND INTENDED LENGTH OF STAY IS INDEPENDENT OF AREA OF RESIDENCE

Indeed, this pattern of association is observed in the table of raw data (Table 8) with a similar distributional pattern of responses in terms of plot ownership in the city and intended length of stay for almost all the areas. The data shows that in all the areas the majority of the respondents who have not acquired plots in the city fall within the first two length of stay categories (i.e Don't know and No) while the majority of those respondents who have acquired a plot in the city are observed in the third length of stay category (i.e. permanent stay). This pattern is also reflected in the expected cell frequencies which shows very little disagreement with the observed values.

Thus, although the proportional distribution of the plots acquired by those respondents who intend a permanent stay in the city varies between areas (e.g. 20 in Area 1, 7 in Area 2, 23 in Area 3, 7 in Area 4 and 7 in Area 5) the lack of significant three-way association despite these variations would indicate that the observed variation is statistically insignificant and therefore might have occurred merely due to chance in the sampling process.

In other words, although the proportional distribution of plots acquired by respondents who intend a permanent stay in the city favours certain areas (e.g. Dadin Kowa and Kabong) which would imply an association between respondents intended length of stay in the city and area of residence, this association is apparently independent of plot ownership categories.

THE ASSOCIATION BETWEEN INTENDED LENGTH OF STAY AND AREA OF RESIDENCE IS INDEPENDENT OF PLOT OWNERSHIP CATEGORIES

Table 11 below, illustrates this pattern of relationship.

The data in the table show two distinct distributional patterns of responses along the plot ownership categories, whereby the majority of the respondents in the first plot ownership category (No plot in the city) fall within the first two length of stay categories (i.e. Don't know and No).

However, the majority of the respondents who have acquired a plot in the city for all the study areas relate better to the third length of stay category (i.e. permanent stay category). This distributional pattern of responses would seem to suggest that the association between intended length of stay in the city and area of residence is dependent on plot ownership in the city. But the pairwise association identified as in the previous cases indicates that the differences in the distributional patterns observed is not statistically significant to generate a three way interaction. This argument is supported by the lack of significant difference between the observed and expected cell frequencies given in Table 11. The difference in the distributional pattern of responses must have emerged due to chance in the sampling process.

TABLE 11 OBSERVED/EXPECTED FREQUENCY DISTRIBUTION, INTENDED LENGTH OF STAY IN THE CITY, AREA OF RESIDENCE AND PLOT OWNERSHIP IN THE CITY CROSS-CLASSIFIED.

	PLOT OWNERSHIP LEVEL									
LENGTH OF STAY CATEGORIES	NO PLOT CATEGORY (1)					HAVE PLOT CATEGORY (2)				
	AREAL LEVEL									
	1	2	3	4	5	1	2	3	4	5
DON'T KNOW (1)	42	29	18	13	18	12	4	10	5	6
	40.12	28.93	18.94	13.37	18.64	13.88	4.067	9.064	4.626	5.36
NO (2)	17	45	30	16	13	4	4	9	4	2
	17.18	44.95	29.84	16.37	12.66	3.815	4.054	9.163	3.63	2.33
PERMANENT STAY (3)	6	7	8	4	4	20	7	23	7	7
	7.69	7.12	3.25	3.69		18.30	6.87	23.77	7.74	7.304

A BRIEF DISCUSSION OF THE RESULTS

The patterns of interaction observed from the data would seem to suggest that the lack of a three-way interaction between the variables can be attributed to the rather low proportion of respondents who intend a permanent stay in the city as well as the corresponding low proportion of development plots acquired in the city. Obviously, if the proportion of the respondents in this category were higher than the observed values the pattern of relationship would have been different since a statistically significant three-way interaction would have emerged.

Although the association identified between plot ownership in the city and area of residence does not arise (as suggested by the pairwise association model) from the variation in the proportional distribution of permanent migrants between the areas, the apparently significant association between plot ownership in the city and permanent migration (despite the very few respondents in this category) implies that improvement within the study areas would ultimately depend on a proportional distribution of permanent migrants between the areas.

Of course, the relationship between plot ownership and area of residence in the city cannot depend on intended length of stay categories since plot acquisition in the city is not restricted to permanent migrants alone. Indeed, the data shows that 38 of the 124 plots acquired in the city belong to respondents not committed to a permanent stay in the city (i.e. those in the No and Don't know categories). This explains in part why the relationship between plot ownership and area of residence is not dependent on categories of intended length of stay in the city.

However, as Peil (1976) has observed, most of the plots acquired by migrants who are not committed to a permanent stay in the city are almost always developed for rental purposes as opposed to owner occupation. This type of housing therefore falls within a different category since it is regarded as an investment.

It follows from the above pattern of association that the interaction between plot ownership and intended length of stay in the city would be independent of the areal dimension since the association between plot ownership and area of residence is not itself dependent on intended length of stay category. Similarly, the interaction between area of residence and intended length of stay in the city would be independent of plot ownership for the same reason.

CONCLUSION

The log-linear model analysis undertaken in this chapter has elaborated significantly the pattern of association observed between plot ownership in the study areas (or the propensity to consolidate) and permanent migration observed in the chi-square analysis of the previous chapter. The log-linear modelling enabled the introduction of a third variable (i.e. the areal dimension).

The pairwise association model which provided the best fit for the data implies that each pair of the three variables are related or associated but that the association between any of the pairs is not dependent on the categories of the third variable.

While this pattern of association implies that the association between plot ownership in the study area and the propensity to stay

indefinitely in the city is not dependent on area of residence, the apparently significant association that exists between plot ownership in the study area and intended permanent migrants confirms the assertion of this study, which argues that not all the migrants strive to consolidate their position in the city. The result of the analysis also confirms that varying migratory characteristics in terms of intended length of stay leads to varying housing demands and priorities in the city.

The varying strength of the association between plot ownership and permanent migrants from area to area, which correspond largely with the proportional distribution of permanent migrants would seem to suggest that some areas are more attractive to permanent migrants and therefore more likely to improve than others. This is also supported by the existence of a strong association implied in the pairwise model, between intended length of stay and area of residence, and between plot ownership and area.

Contrary to Turner's assumptions about migrants propensity to consolidate in the city, the above patterns of associations show quite clearly that the propensity to consolidate in the city is associated more closely with permanent migrants and cannot be regarded as common to all migrant groups. The bridgeheader - consolidator dichotomy has no direct application within the context of these study areas since it portrays only the desires of permanent migrants. Yet, only a small proportion of the respondents in all the areas intend an indefinite stay in the city. The relatively small proportion of respondents in this category indicates not only that the consolidators are in the minority but also points to the very limited improvement that can be expected

generally and within the individual study areas. Given this situation it is quite doubtful if the very few consolidators can make a significant impact on the housing deficit in the city through their self built housing.

CHAPTER SEVEN

RELATIONSHIP BETWEEN PLOT OWNERSHIP IN THE HOMETOWN, TYPE OF MIGRATION AND AREA OF RESIDENCE IN JOS

The data in Table 12 is the cross-classified observed frequency of responses in terms of plot ownership in the hometown, intended retirement in the hometown and area of residence in the city. The data has been analysed as in the previous case using the computer programme - GLIM. Table 13, shows the results of the analysis in which all five hypotheses of independence were tested.

The purpose of this analysis is to identify the underlying relationship between plot ownership in the hometown, type of migration (in terms of whether migrants intend to retire in their rural hometown) and area of residence in the city of migration, since implied in the hypotheses of this study is the proposition that migrants who intend to retire in their hometown are not likely to consolidate the position in the city. Rather they are more likely to consolidate their position in the rural hometown where they hope to retire.

The chi-square test undertaken in Chapter Five showed that temporary migrants (i.e. migrants who intend to retire in their hometown) are more closely associated with rented accommodation. This could mean that this category of migrants might be attracted towards specific areas of the city where their housing needs are best met. If that is the case, then migrant reception nodes in the city are likely to vary in their capacity to improve through self help housing.

TABLE 12 FREQUENCY DISTRIBUTION: PLOT OWNERSHIP IN THE HOMETOWN, DESIRE TO RETIRE IN HOMETOWN AND AREA
OF RESIDENCE IN THE CITY: CROSS-CLASSIFIED

	STUDY AREA (1)	STUDY AREA (2)	STUDY AREA (3)	STUDY AREA (4)	STUDY AREA (5)
	LENGTH OF STAY LEVEL				
	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)
HAVE NO PLOT IN HOMETOWN	9 12 9	10 2 5	7 14 16	1 1 4	3 7 10
HAVE PLOT IN HOMETOWN	21 1 44	9 0 66	9 15 35	4 5 32	6 3 21

TABLE 13 TESTS OF INTERACTION BETWEEN PLOT OWNERSHIP IN THE HOMETOWN, PROPENSITY TO SETTLE IN HOMETOWN AND AREA OF RESIDENCE IN THE CITY

MODEL	DEFINING SET	χ^2	DF	$\chi^2 - \chi^2$	DIFFERENCE DF	PARAMETER TESTED	RESULT OF TEST
1	PLH A R	122.8	22				
2	PLH + A + R + PLH.A	103.3	18	19.5	2	PLH.A	significant beyond 0.001
3	PLH + A + R + PLH.R	79.96	20	42.84	2	PLH.R	significant beyond 0.001
4	PLH + A + R + A.R	79.77	14	43.00	8	A.R	significant beyond 0.001
5	PLH+A+R+PLH.R+A.R	36.96	12			PLH.R	significant beyond 0.001
6	PLH+A+R+A.R+PLH.A	60.32	10			PLH.A	significant beyond 0.001
7	PLH+A+R+PLH.R+PLH.A	60.51	16			PLH.A	significant beyond 0.001
8	PLH+A+R+PLH.R+A.L+PLH.A	26.62	8			A.R+PLH.R+ PLH.A	significant at 0.05 level
9	PLH+A+R+A.R+PLH.R+PLH.A+PLH.A.R	0	0				significant beyond 0.001

MODEL SELECTION

Model 1 of Table 13, shows the results of the test for mutual independence between the three variables. The result indicates a χ^2 value of 122.8 with 22 degrees of freedom (see also Table 1, Appendix V). This χ^2 value thus becomes the 'baseline value' for testing the conditional importance of the parameters included in the tests for multiple independence. Models 2, 3 and 4 provide the results of the tests for multiple independence hypothesis. Model 2, tested the interaction PLH.A (i.e. plot ownership in hometown and area of residence in the city). The result of the first shows a significant interaction beyond 0.001 level between the two variables (see Table 2, Appendix V for parameters). This is exemplified by the reduction in χ^2 value from 122.8 with 22 degrees of freedom to 103.3 with 18 degrees of freedom; this represents a reduction of 19.5 with 2 degrees of freedom. The parameters generated by each of the models is provided in Appendix V, Tables 1 to 8 respectively.

The result in model 3 also shows a significant PLH.R interaction (i.e. plot ownership in the hometown and intended retirement in the hometown). This interaction reduced the χ^2 value from the baseline value of 122.8 with 22 degrees of freedom to 79.96 (summarised from Table 3, Appendix V) with 20 degrees of freedom which represents a reduction of 42.84 with 2 degrees of freedom which is significant beyond 0.001 level. The interaction A.R. (i.e. area of residence and intended retirement in the hometown) in model 4 (which is a summary of Table 4, Appendix V) provided the least χ^2 value at 79.77 with 14 degrees of freedom, thus a reduction of 43.00 with 8 degrees of freedom which is also significant beyond 0.001 level.

Although the interaction A.R provided the least Y^2 value, it involves a loss of more degrees of freedom (from 22 to 14) than the interaction PLH.R. Therefore, the latter interaction should perhaps be considered as most important. This significant association also confirms the pattern of association between plot ownership in the hometown and intended retirement in the hometown observed in the chi-square test of the previous chapter.

The test of conditional independence between the variables (results of which are presented in models 5, 6 and 7) indicates that the interaction with the strongest association is A.R model 5, (see Table 5, Appendix V), which reduced the Y^2 value from 79.96 with 20 degrees of freedom (observed in model 3 above) to 36.96 with 12 degrees of freedom. This interaction is significant beyond 0.001 level. It represents a reduction of 43.00 with 8 degrees of freedom.

However, the rest of the tests for pairwise association between the variables shown in model 8 (taken from Appendix V, Table 8), indicates that there is a pairwise association between PLH.A + PLH.R + A.R. Although this interaction reduced the Y^2 value down to 26.62 with 8 degrees of freedom from the value of 36.96 with 12 degrees of freedom observed in model 5, the interaction is significant only at 0.05 level. This means that if a more stringent level of significance were to be adopted, this interaction might have to be dropped as insignificant.

This rather weak pairwise association as indicated by the Y^2 value and the corresponding degrees of freedom is indicative of a saturated model interaction between the variables, since the saturated model includes all possible interaction terms and therefore has no degrees of

freedom. Thus under the saturated model the interaction is significant beyond 0.001 level.

These results suggest that the model that fits the data best is the saturated model hypothesis, which implies that all the variables included in the model are interrelated. The pattern produced by the data would therefore be better explained within the context of this model.

The hierarchical nature of the log-linear model can again be observed in this application of the model, which shows a stepwise decline in the proportion of the unexplained variation (Y^2). The most significant associations attributed firstly, to PLH.R which reduced the Y^2 value from 122.8 with 22 df to 79.96 with 20df. This is followed in the hierarchy by the interaction A.R which reduced further the Y^2 value to 36.96 with 12df and the interaction PLH.A which reduced the Y^2 value to 26.62 with 8 degrees of freedom. This Y^2 value is also significant within the context of PLH.A.R. Thus models 3, 5, 8 and 9 depict the hierarchy of importance.

INTERPRETATION OF THE BEST FIT MODEL: SATURATED MODEL HYPOTHESIS

As mentioned above, the saturated model implies that all the variables included in the parameters of the model are interrelated. This suggests three types of association since only three interaction terms were included in the model.

Firstly, it implies that there is a significant association between plot ownership in the hometown (PLH) and areas of residence in

the city (A) but, that this association is dependent on the categories of intended retirement area (R). Secondly, it implies that there is a significant association between plot ownership in the hometown and the propensity to retire in the hometown, but this association is dependent on the categories of the third variable - area of residence in the city. Thirdly, it implies an association which is dependent on plot ownership categories, between Respondent's area of residence in the city and the propensity to retire in the hometown. Each of these associations are examined below.

THE ASSOCIATION BETWEEN PLOT OWNERSHIP IN THE HOMETOWN AND AREA OF RESIDENCE IN JOS IS DEPENDENT ON CATEGORIES OF INTENDED RETIREMENT AREA

The implied association (which is dependent on categories of retirement areas) between plot ownership in the hometown and respondents area of residence in the city would seem to suggest that there is a significant variation between the study areas not only in terms of proportional distribution of those respondents who intend to retire in their hometown but also in terms of the distribution of those respondents who intend to retire in their hometowns and have acquired plots of land in the same.

This pattern which the model is trying to simplify is portrayed in Table 14 below. The table shows that the distribution of responses in terms of plot ownership in the hometown and area of residence in the city varies along the categories of intended retirement areas. The majority of the respondents in the 'don't know' category in all the areas have acquired plots in the hometown. The only exception being area 2 (i.e. Tudun Wada area) where the majority of respondents in this category

TABLE 14 THREE-WAY TABLE: PLOT OWNERSHIP IN THE HOMETOWN, AREA OF RESIDENCE BY PROPENSITY
TO RETIRE IN THE HOMETOWN

PLOT OWNERSHIP CATEGORIES	RETIRE IN HOMETOWN?																			
	DON'T KNOW					NO										YES				
	AREAL CATEGORIES					AREAL CATEGORIES										AREAL CATEGORIES				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)					
NO PLOT IN HOMETOWN (1)	9	10	7	1	3	12	2	14	1	7	9	5	16	4	10					
HAVE PLOT IN HOMETOWN (2)	21	9	9	4	6	1	0	15	5	3	44	66	35	32	21					

are in plot ownership category 2. This pattern is different from that observed in retirement category 2 (i.e. the 'No' category). In this category, the majority of the respondents in all the areas (except 3 and 4 i.e. Kabong and Jenta Adamu) are in the plot ownership category 1. In the third retirement category (intended retirement in the hometown category) a majority of the respondents are in the plot ownership category 2, i.e. have acquired a plot in the hometown.

While the pattern observed in retirement categories 1 and 3 appear to be similar, it is clear that the majority of the respondents who have acquired a plot in their hometowns are largely in the third retirement category. Thus, although there is a clear association in all the areas between those who have acquired a plot and retirement in the hometown, the extent of this association appears to vary between areas.

The observed differences in the distributional pattern of responses along the retirement categories indicates that there is a relationship between plot ownership in the hometown and residential areas in the city but this association is dependent on whether the respondents intend to retire in their rural hometown. In other words this association is dependent on the proportional distribution between the areas of respondents who intend to retire in their hometowns. The presence of a saturated model interaction would suggest that the observed differences in the distributional patterns of responses along the retirement category is statistically significant and is likely to represent a 'real' difference in both the population and the areas. It is not likely to have occurred due to chance in the sampling process.

This underlying pattern of association as suggested by the model seems to accord with the proposition of the hypothesis of this study, which suggests that plot ownership in the hometown is closely associated with the propensity to retire in the hometown. Moreover, it indicates that there is a clear preference for plot ownership in the hometown as opposed to the city of migration, depicting in a way the dominance of temporary migration in the study areas generally.

THE ASSOCIATION BETWEEN PLOT OWNERSHIP IN THE HOMETOWN AND INTENDED RETIREMENT IN THE HOMETOWN IS DEPENDENT ON AREA OF RESIDENCE IN THE CITY

The implied significant association (which is dependent on respondent's category of areas of residence in the city) between plot ownership in the hometown and intended retirement area would seem to suggest a significant clustering within certain areas of respondents who intend to retire in their hometown. Table 15, which shows the observed frequency of responses in terms of plot ownership in the hometown by propensity to retire in the hometown by area of residence, supports the above argument.

The distributional pattern of responses as observed from Table 15 below, illustrates the dependency of the association between plot ownership in the hometown and the propensity to retire in the hometown on respondents area of residence in the city. The data shows that in all the areas, a majority of the respondents who have acquired plots in the hometown fall within retirement category three (i.e. intend to retire in their hometowns) which portrays the association between plot ownership in the hometown and the propensity to retire in the hometown.

TABLE 15 THREE WAY TABLE: PLOT OWNERSHIP IN THE HOMETOWN BY PROPENSITY TO RETIRE IN HOMETOWN BY AREA OF RESIDENCE IN THE CITY

PLOT OWNERSHIP CATEGORIES	AREAL CATEGORIES				
	AREA (1)	AREA (2)	AREA (3)	AREA (4)	AREA (5)
	RETIREMENT CATEGORIES	RETIREMENT CATEGORIES	RETIREMENT CATEGORIES	RETIREMENT CATEGORIES	RETIREMENT CATEGORIES
NO PLOT IN HOMETOWN	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)	(1) (2) (3)
	9 12 9	10 2 5	7 14 16	1 1 4	3 7 10
HAVE PLOT IN HOMETOWN	21 1 44	9 0 66	9 15 35	4 5 32	6 3 21

However, the proportional distribution of the respondents in this category varied between the study areas. The proportion of respondents who have acquired plots in the hometown and also intend to retire in the hometown is highest in Area 1 (Dadin Kowa) and Area 2 (Tudun Wada). The significance of the association between plot ownership in the hometown and propensity to retire in the hometown (in these areas) is exemplified by the distribution of the respondents in retirement category two along the plot ownership categories. In these areas (including to some extent area 5, Anglo-Jos) a larger proportion of respondents in retirement category 2 are in plot ownership category one (i.e. have not acquired plots in the hometown). The reverse however, is the case in area 3 (Kabong) and area 4 (Jenta-Adamu).

Considering the distribution of those respondents in retirement category one along the plot ownership categories, the data in the table indicates that a larger proportion of the respondents in this category, for all the areas, (except area 2, Tudun Wada) are in plot ownership category 2. This is especially so in area 1. In area two a larger proportion of those in retirement category one, are in plot ownership category one (i.e. have no plots) which also indicates that area two has a larger proportion of respondents who intend to retire in the hometown and have also acquired plots in the hometown.

This varying distributional pattern of responses between the areas indicates as suggested by the saturated model hypothesis that the association between plot ownership in the hometown and the propensity to retire in the hometown is dependent on area of residence in the city. This also indicates as observed above that certain areas have a concentration of respondents who have acquired plots in their hometown and also intend to retire in their rural hometown.

THE ASSOCIATION BETWEEN AREA OF RESIDENCE IN JOS AND INTENDED RETIREMENT
IN THE HOMETOWN IS DEPENDENT ON PLOT OWNERSHIP CATEGORIES IN THE HOMETOWN

Given the above settlement patterns in the city, it is not surprising therefore, that there is a significant association between areas of residence in the city and intended retirement in the hometown but that the relationship is dependent on plot ownership category. This pattern of relationship is illustrated in Table 16 below.

The distributional pattern of responses between the two plot ownership categories observed in Table 16 below are distinctly different. Whereas in the first plot ownership category (i.e. no plot in hometown category) the distribution of respondents along the three retirement categories shows a varying pattern between the areas, the distribution of respondents in plot ownership category two (along retirement categories) showed a clear preference.

In area 1 a larger proportion of the respondents in plot ownership category 1 (i.e. have no plots) are in the retirement category 2 (i.e. do not intend to retire in the hometown). In area 2 the majority are in retirement category 1 (i.e. Don't know) while in areas 3, 4 and 5 the majority are in retirement category 3. However, the distribution of respondents in plot ownership category 2 for all the areas shows that they are largely in retirement category 3 (i.e. intended retirement in the hometown). But as mentioned earlier the proportion of respondents in this category varies between areas.

This pattern of responses as illustrated in the table below shows not only that plot ownership is associated with intended retirement

TABLE 16 PROPENSITY TO RETIRE IN THE HOMETOWN BY AREA OF RESIDENCE IN THE CITY BY PLOT OWNERSHIP IN THE HOMETOWN

RETIREMENT CATEGORIES	PLOT OWNERSHIP CATEGORIES									
	NO PLOT IN HOMETOWN (1)					HAVE PLOT IN HOMETOWN (2)				
	AREAL CATEGORIES					AREAL CATEGORIES				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Don't know (1)	9	10	7	1	3	21	9	9	4	6
NO (2)	12	2	14	1	7	1	0	15	5	3
YES (3)	9	5	16	4	10	44	66	35	32	21

in the hometown but also that the association between intended retirement in the hometown and area of residence in the city is dependent on the proportional distribution, between the areas, of respondent who have acquired plots in the hometown and intend to retire in the same. The dependency nature of this association if anything, indicates that the areas are different in terms of the distribution of respondents who intend to retire in their hometown as well as in the proportion of respondents in this category who have acquired plots in preparation for their retirements in the hometown. This corresponds with the pattern of association discussed earlier which suggests an association between plot ownership in the hometown, and the propensity to retire in the hometown.

Given that the above association between plot ownership in the hometown and the propensity to retire in the hometown is dependent on area of residence in the city, the dependency of the association on the areal dimension could imply one of two things, either that the level of association varies in strength between areas or possibly that the association is not valid for some areas.

In the section that follows, an attempt is made to identify which of the above factors explains the variation. Identification of the factor responsible would obviously provide a lot of insight in understanding the nature of the various study areas as well as in determining the scope of policy for a more controlled urban growth.

TESTS OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP IN THE HOMETOWN
AND INTENDED RETIREMENT IN THE HOMETOWN BY AREA OF RESIDENCE IN THE CITY

In order to achieve the above stated objective, the data has been analysed separately for each of the study areas - testing for mutual independence between plot ownership in the hometown and the propensity to retire in the hometown. This represents a factor response situation in which plot acquisition is the response to the factor - desire to retire in the hometown. Table 17 below shows the data for each of the study areas. The parameters generated by the analysis of the data for each of the study areas is given in Appendix VI. Table 18 below provides the summaries of the results of the tests.

The results as presented in Table 18 shows that in two of the study areas, Area 1, Dadin Kowa, and Area 2, Tudun Wada, (see Appendix VI, Tables 1 and 2 for parameters) the association between plot ownership in the hometown and the propensity to retire in the hometown are significant beyond 0.001 level. This means that in these two areas plot ownership in the hometown is significantly associated with the propensity to retire in the hometown. In the remaining three study areas (Kabong, Jenta Adamu and Anglo-Jos) the interaction is not at all significant.

These results would seem to indicate that the variation in the association between plot ownership in the hometown and the propensity to retire in the hometown among categories of residential areas can be attributed to variation in the proportional distribution of respondents who have acquired plots of land in their hometown and intend to retire in their hometowns. In other words, Dadin Kowa and Tudun Wada study areas appear to have the largest concentration of respondents who have

TABLE 17 OBSERVED FREQUENCY DISTRIBUTION: PLOT OWNERSHIP IN HOMETOWN
AND INTENDED RETIREMENT BY STUDY AREA

1. DADIN KOWA AREA

PLOT IN HOMETOWN?	RETIRE IN HOMETOWN?		
	DON'T KNOW	NO	YES
NO	9	12	9
YES	21	1	44

2. TUDUN WADA AREA

PLOT IN HOMETOWN?	RETIRE IN HOMETOWN?		
	DON'T KNOW	NO	YES
NO	10	2	5
YES	9	0	66

3. KABONG AREA

PLOT IN HOMETOWN?	RETIRE IN HOMETOWN?		
	DONT 'T KNOW	NO	YES
NO	7	14	16
YES	9	15	35

4. JENTA ADAMU AREA

PLOT IN HOMETOWN?	RETIRE IN HOMETOWN?		
	DON'T KNOW	NO	YES
NO	1	1	4
YES	4	5	32

5. ANGLO-JOS AREA

PLOT IN HOMETOWN?	RETIRE IN HOMETOWN?		
	DON'T KNOW	NO	YES
NO	3	7	10
YES	6	3	21

TABLE 18 TEST OF INTERACTION BETWEEN PLOT OWNERSHIP IN HOMETOWN AND THE PROPENSITY TO RETIRE IN THE
HOMETOWN BY AREA OF RESIDENCE IN THE CITY

AREA	DEFINING SET	χ^2	DF	PARAMETER TESTED	RESULT OF TEST
DADIN KOWA	PH + RT	27.25	2	PH.RT	significant beyond 0.001 level
TUDUN WADA	PH + RT	25.60	2	PH.RT	significant beyond 0.001 level
KABONG	PH + RT	2.450	2	PH.RT	NOT SIGNIFICANT
JENITA ADAMU	PH + RT	0.3732	2	PH.RT	NOT SIGNIFICANT
ANGLO-JOS	PH + RT	4.641	2	PH.RT	NOT SIGNIFICANT

acquired plots in their hometowns because of their desire to retire there. This pattern can be observed from the table of raw data - Table 12, which indicates that, while there is a clear preference for plot ownership in the rural hometown amongst migrants who intend to retire in the rural areas, in all the study areas, the proportion of respondents who have acquired such plots are higher in Tudun Wada 71% and Dadin Kowa 45%.

If this pattern of association is considered as an indication of the level of commitment to retiring in the hometown, then it can be said that in Dadin Kowa and more so in Tudun Wada study areas, consolidation has been directed largely away from the settlements towards the rural hometowns. The respondents in these areas are likely to remain bridgeheaders while in the city. These areas are therefore less likely to improve through self help housing. Turner's bridgeheader - consolidator dichotomy does not appear to have practical application within the context of these areas. Rather the dichotomy between permanent and temporary migrants appears to have more practical application and provides a more meaningful explanation for the possible lack of self improvement in these areas.

This does not however imply that the remaining study areas are therefore necessarily self improving sub areas. The results of this analysis have only pointed to the extreme situation. That is, areas in which a significantly large proportion of those respondents who intend to retire in their hometowns have demonstrated their commitment by acquiring plots in the hometown. Yet even in Dadin Kowa area where this appears to be the case, a significantly large number of the respondents in the don't know category (21) have also acquired plots in their hometowns.

Obviously, more analysis is required if those relatively self improving sub areas are to be identified. In order to do this a test of mutual independence between plot ownership in the city and intended length of stay has to be undertaken for each of the areas. It will be recalled that in the last chapter the test between plot ownership in the city, permanent migration and area of residence revealed a pairwise association between the variables indicating that there is an association between plot ownership in the city and intended permanent stay but the association is independent of areas of residence in the city. This would suggest that the association is significant for all the areas. The aim of the analysis here would be to identify the area(s) in which this association is strongest.

TESTS OF RELATIONSHIP BETWEEN PLOT OWNERSHIP IN THE CITY AND TYPE OF MIGRATION BY AREA OF RESIDENCE IN THE CITY

Table 19 below shows the cross-classified data for each of the five study areas, while Table 20 presents the results of the tests. It is hoped that a comparison of the results of the tests in Table 15 and Table 20 would lead to the identification of a relatively polarised settlements in terms of relatively less self improving and relatively more self improving subareas. The parameters generated by the analysis of the cross-classified data for each of the study areas are given in Appendix VII, Tables 1 to 5.

It is interesting that although the results of the above test (see Table 20) shows as expected that, there is a significant association between plot ownership in the city and permanent migration in the city, (in all the areas) but the significance of the association varies from area to area. The association appears to be strongest in area 3 (Kabong) and

TABLE 19 OBSERVED FREQUENCY DISTRIBUTION: PLOT OWNERSHIP IN THE CITY
INTENDED LENGTH OF STAY CROSS-CLASSIFIED BY STUDY AREA

1. DADIN KOWA AREA

PLOT IN CITY?	PERMANENT STAY IN CITY?		
	DON'T KNOW	NO	YES
NO	42	17	6
YES	12	4	20

2. TUDUN WADA AREA

PLOT IN CITY?	PERMANENT STAY IN CITY?		
	DON'T KNOW	NO	YES
NO	29	45	7
YES	4	4	7

3. KABONG AREA

PLOT IN CITY?	PERMANENT STAY IN CITY?		
	DON'T KNOW	NO	YES
NO	18	30	8
YES	10	9	23

4. JENTA ADAMU

PLOT IN CITY?	PERMANENT STAY IN CITY?		
	DON'T KNOW	NO	YES
NO	13	16	4
YES	5	4	7

5. ANGLO-JOS AREA

PLOT IN CITY?	PERMANENT STAY IN CITY?		
	DON'T KNOW	NO	YES
NO	18	13	4
YES	6	2	7

TABLE 20 TEST OF INTERACTION BETWEEN PLOT OWNERSHIP IN THE CITY AND INTENDED PERMAENT MIGRATION IN THE CITY
BY STUDY AREAS

AREA	DEFINING SET	χ^2	DF	PARAMETER TEST	RESULT OF TEST
DADIN KOWA	PL + L	25.82	2	PL.L	significant beyond 0.001 level
TUDUN WADA	PL + L	11.72	2	PL.L	significant beyond 0.001 level
KABONG	PL + L	19.82	2	PL.L	significant beyond 0.001 level
JENITA ADAMU	PL + L	6.199	2	PL.L	significant beyond 0.05 level
ANGLO-30S	PL + L	7.894	2	PL.L	significant beyond 0.02 level

Dadin Kowa (area 1) where the interaction is significant beyond 0.001 level. In Tudun Wada (area 2) the interaction is significant at 0.01 level, in Jenta Adamu (area 4) at 0.05 level and in Anglo-Jos at 0.02 level.

The reasons for this variation in the level of association (plot ownership in the city and permanent migration) between areas can again be seen in the table of raw data (Table 19). The varying degree of significance corresponds with the proportional distribution, between areas, of respondents who intend to stay permanently in the city and have acquired plots in line with their commitment. This proportion is highest in area 3 (Kabong 23%) and Dadin Kowa (area 1) with 19.8%. In the remaining areas Tudun Wada, Jenta Adamu and Anglo-Jos the proportions are 7.2%, 14.0% and 14.0% respectively.

However, if a more stringent level of significance is adopted, say 0.001 then the association would be significant only in Dadin Kowa and Kabong. This means that these areas are more likely to improve through self help housing than the remaining three areas; since a larger proportion of the respondents in these areas have the propensity to consolidate their position in the city. Yet, if the significant association between plot ownership in the hometown and the propensity to retire in the hometown observed in Dadin Kowa area (Table 18) is considered, then the area can be said to be significantly different not only from Kabong study area but also from the rest of the study areas. It appears to have both the attributes under consideration.

Within the context of these findings Table 13 and Table 20, it can be said therefore that Tudun Wada study area on the one hand and Kabong

study area on the other, represent polar situations in which most of the respondents in Tudun Wada are less likely to consolidate their stay in the city than their counterparts in Kabong study area. In between these polar cases lies Dadin Kowa study area which shows both tendencies.

This taxonomy corresponds with the reception areas of certain migrant groups (discussed earlier in the study) in which Tudun Wada appears to be the reception node of the long distance migrants, Kabong the reception node of the short distance migrants and Dadin Kowa, the reception area of the medium distance migrants. It can be deduced from the above residential patterns as well as the patterns of association that, short distance migrants are more likely to consolidate their stay in the city (or stay permanently) than medium distance and long distance migrants. Similarly, medium distance migrants are more likely to make permanent migrations and therefore more likely to become consolidators than long distance migrants. In other words, the findings of this study would seem to suggest that the desire to return to the hometown (i.e. to make temporary migration) increases with migratory distances, or that the propensity to stay permanently in the city (i.e. to become consolidators) increases with the proximity of the hometown to the city of migration.

These classifications should not however be taken to mean that Kabong study area fits Turner's model. As mentioned earlier, most of the respondents generally and in this study area did not stay initially in the city centre. In other words, their settlement in the area did not occur due to intra-urban mobility. The majority moved straight from the rural areas to the study areas. Turner's assumptions regarding intra-

urban mobility, social mobility and the growth of uncontrolled subareas is not valid in this area. This also implies that the bridgeheader consolidator dichotomy does not apply.

This classification however shows that in relative terms, Kabong area represents the reception node of permanent migrants who have shown their commitment to an indefinite stay in the city by acquiring building land. This means that the respondents in this area are more keen on consolidating their stay in the city than in any of the areas studied. This area is therefore more likely to improve through self-help housing than any of the areas studied. The classification is thus based on the dichotomy between permanent and temporary migration.

CONCLUSION

The findings of the preceding analysis shows that there is a functional relationship between migratory pattern, and the growth of physical characteristics in uncontrolled subareas. It also shows that in regions where rural-urban migration assumes a predominantly temporary dimension, the distinction between permanent and temporary migrants in uncontrolled subareas (as opposed to Turner's bridgeheader consolidator distinction) has more validity and practical application. It provides not only a framework for understanding the varying housing demands that arises from varying migratory patterns but also a framework for understanding the development process of uncontrolled subareas especially in terms of why some might improve in situ and why others may not. It thus provides a framework for the formulation of a more comprehensive housing policy for the low-income group and their areas of residence.

These findings also demonstrate that uncontrolled settlements even those of the same city vary in their capacity to improve. Obviously, given the variation observed between the areas and indeed the migrants groups, it is difficult to conceive of a universal policy for uncontrolled subareas.

Whereas, the most advocated self-help housing policy may be appropriate and perhaps more likely to gain acceptance in Kabong study area where the respondents strive to become consolidators, it may not gain the same level of acceptance or success in the other study areas where migrants appear to be much more keen on consolidating their position in the rural hometowns. Thus, understanding the problem of uncontrolled development from the migratory prospective and the settlement patterns that give rise to these areas is an essential ingredient in the generation of appropriate policies for the areas.

CHAPTER EIGHT

A TYPOLOGY OF UNCONTROLLED SUBAREAS

The results of the preceding analysis indicate that rural-urban migration (in terms of whether it is permanent or temporary) depicts different specific desires in terms of housing needs and housing ambitions. The chi-square tests indicated that temporary migrants are associated or prefer cheap rental accommodation while permanent migrants strive for consolidation in the city. The log-linear analysis also showed that there is a functional relationship between permanent migration and relative involvement in self help housing activity that has taken place in individual study areas. This is exemplified by the varying strength of the association between permanent migration and plot ownership between the areas which coincide with the proportional distribution of permanent migrants as well as the proportional distribution of plots acquired by permanent migrants.

JOS UNCONTROLLED SETTLEMENTS AND SELF HELP HOUSING POLICY

Despite the evidences presented above which indicates that uncontrolled subareas, even those of the same city, are not synonymous, most of the empirical description about the way in which Latin American squatters behaved, their needs and priorities are directly transposed into new housing policy and advanced as the panacea to the phenomenon of uncontrolled urban development of the Third World cities.

The provision of 'Security of Tenure', basic services, technical

assistance, and upgrading are all increasingly seen by some analysts and indeed Third World governments as offering a solution, arguing that faced with limited opportunity for socio-economic mobility elsewhere, the settlements provides the households with a vehicle of upward mobility (Turner, 1969 p.50). Costs it is argued, are minimal and economic improvement is manifested in-situ rather than via residential mobility between neighbourhoods of different class (Turner, 1970 p.2),

The evidence from this study indicates that the uncontrolled settlements are the main reception areas of newly arrived migrants. They do not emerge as a result of intra-urban mobility from the inner city neighbourhoods neither are the settlements a manifestation of a desire for house ownership. Moreover, the propensity to consolidate in the city is not shared by the majority of the respondents. Consequently any unquestioning attempt to apply the self help housing solution as a policy for the problem of uncontrolled subareas in Jos may not achieve the desired outcome.

It has been observed in the literature review to this study, (Chapter Two) that the concept of self help housing is embedded in empirical practice, made credible by a large body of literature. In addition, it has been sponsored by the main aid and development foundations such as the 'World Bank' and the 'United Nations' whose aims may be interpreted (in the light of these conflicting evidences) as ranging from a genuine attempt to improve the living conditions of the urban poor to one that seeks to maintain the status quo at a time when the possibilities of integrating the less well-off into the productive sector is becoming increasingly remote.

All too often, the case for self help housing policy is overstated without a consideration of the reasons for its development under specific circumstances. The self help phenomenon must itself be analysed in terms of the reasons for its apparently spontaneous development under specific situations if its role as a form of housing policy is to be appropriately defined and its premise achieved.

The principle of self help housing is seen by some analysts as a priori-positive, because housing is actually produced and as long as it is assumed that it leads to a greater autonomy of individual's housing users irrespective of the migratory characteristics, economic, historical and cultural context within which the uncontrolled settlements and the self help process arises. It is proposed therefore that the principle should be the basis of solution of the housing problem as well as the other social problems of the urban poor, (Turner, 1976; Turner and Fichter, 1972; 139) despite varying land tenure and arrangements for access to land for such development.

Although self help housing is responsible for the emergence of some uncontrolled settlements, the formulation of self help housing as an institutional housing policy (irrespective of its apparent successful application in Third World countries) is not based upon a rigorous analysis nor on a theoretical understanding of the processes that could give rise to uncontrolled settlements or the application of the policy proposals in the context of different societies.

The evidence from this research shows that the interpretation of the desirability of building ones own home in the settlement of migration does not necessarily coincide with the views and experience

of those respondents who regard their stay in the city as temporary and as such were instead having to do the self help building in their rural hometowns. In effect, they prefer cheap rental accommodation while in the city. The need for cheap rental accommodation and the desire to retire in the rural hometown as the data showed coincide with the views of the majority of the respondents interviewed. Yet, the self help housing concept assumes that a large proportion of the housing in such areas are self built and that a majority of the people wish to build their own houses.

The interpretation that self help leads to greater autonomy of the people in need of housing does not therefore correspond with the views and experience of those migrants not committed to a permanent stay since they prefer cheap rented accommodation. There is no doubt however, that housing is actually produced through self help construction as indicated by the data obtained from Kabong study area and to some extent Dadin Kowa study area. But given the overall situation in the city, it is doubtful whether it is an adequate basis for housing policy. To make a judgement, it is important to define who practices self help, what the motivation for such practices are and the likely location of such self help housing.

In almost all Third World cities, especially the secondary cities, there is the need for housing. However, the way in which this need is felt and fulfilled within the same society varies markedly for different groups and is highly specific to particular forms of social and cultural organisations. This implies not only that all such needs and how they are best realised must be cautiously studied but also indicates the dangers of generalising about the housing needs of the poor.

This study has shown that migratory characteristics of the people involved in terms of whether they regard their stay in the city as temporary or permanent is one such dimension of differentiating between migrants housing needs and desires, the need to consolidate in the city and thus the occurrence of self-help housing coincides with the views and experience of those migrants who intend an indefinite stay in the city. The need for self help housing in this case, whether individually initiated or group initiated, it seems, arises from the desire to stay permanently in the city as well as the difficulty of reconciling income and prevailing housing costs. However, temporary migrants are attracted to uncontrolled subareas not for the purpose of consolidation or to practice self help, but to benefit from the cheap rented accommodation found in these areas.

This kind of self help practiced by permanent migrants which is initiated and controlled by the beneficiaries can be distinguished from the kind of self help programmes which are initiated and controlled by the government or by external organisations. While the former is 'collective' self help arising from the felt needs and expressed desire of the people involved; with the potentials of increasing their self determination, the second as a policy or institutionalised self-help which emphasises the privatisation of housing and voluntary user contribution, justifying it by declaring housing a personal service and a necessary activity of the residents themselves, ignores the dimension of temporary migration and the type of housing demand it creates.

Martin (1982, p.264) reporting on his experience of squatter upgrading in Lusaka, Zambia, noted that self help and mutual help are fundamental to the success of any improvement schemes. He went on to argue that the pressure and expressed wishes of the residents should

be the starting point for the concept of upgrading.

It would seem therefore, that the proponents of self help housing have ignored the housing demand of the temporary migrants simply because self help appeals to their belief in human ability, ambition and makes sense as a means of overcoming what is becoming an intractable problem. Obviously, for most Third World governments, this is seen as an opportunity of gaining low interest loans or even the overall financing of such projects. No doubt is raised about the wisdom of self help as a form of housing policy. However, the evidence from this study indicates that its application should be based on a careful study of the local situation identifying those elements that might be involved and why they may wish to be involved, thereby justifying the need for such policy as well as evaluating its possible success.

Turner's (1967, 1969) emphasis on the importance of security of tenure assumes not only that most of the bridgeheader population wish to consolidate in the city but also assumes that most Third World uncontrolled settlements suffer from illegality of occupation of land. Turner's approach therefore perceived the land invasion characteristic of Latin American uncontrolled settlements as typical of most Third World uncontrolled settlements. Yet as Gilbert et al (1983) rightly noted, there is no simple definition to what constitutes spontaneous settlements of contemporary Third World cities.

Drakakis-Smith (1981, 1976 p.297) argues that the most acceptable definition rests on the illegality of occupation of land, houses or both. Similarly, Leeds (1969, p.44) in his contribution on the subject suggests that the only uniform identifying characteristics are their

illegal and unordered origin by accretitive or organised invasion and, because of their origin, their continued juridically ambiguous status as settlements.

Notwithstanding, such definitions include inappropriately, the frequent cases of the poor purchasing the land on which they construct their homes. Whereas, the purchase itself normally follows legal procedures, such lands often lack planning consent from the appropriate authority because of inadequate services, physical layout, or their location beyond urban boundaries. As observed in Chapter Three of this study, these factors characterise the growth of uncontrolled subareas in Jos.

Another commonly included factor in the definition of these areas is that the housing is constructed through self-help. While most people would agree that self-help is an essential ingredient in the building of spontaneous settlements, it is inadequate without qualification, since as the data for this study shows, few amongst the poor in the study areas wish to consolidate. The housing is mostly rented.

Gilbert and Gugler (1983) identified four categories in which spontaneous settlements could be classified.

- a) Cases where most of the dwellings were built by the family which originally occupied or now occupy it.
- b) Cases where the settlements as originally founded suffer from some degree of illegality or lack of planning permission.
- c) Cases where, when the settlement was initially founded most forms of infrastructural services were lacking and in many instances services were still lacking

- d) Cases where the settlements are occupied by the poor.

Within these types Gilbert and Gugler (1983) argues that certain subtypes may be included.

- (i) 'Invasions' - of either public or private land. This could be organised or incremental. Basically no purchase of land is involved.
- (ii) 'Private Settlements' - where the land is purchased, but lacks planning permission.
- (iii) Rental Settlements - where houses are built on rented land.
- (iv) 'Usertrust Settlement' - where permission to use communal land has been granted by Community Leaders or private land owners.

The situation is further complicated by the possible overlap in one settlement of these types and subtypes. Indeed, it is difficult to make the above distinction on areal or regional basis.

While Gilbert et al (1983) more than any of the definitions cited above attempts to synthesise the varied and complex nature of uncontrolled subareas, it stops short of including the migratory dimension. The section that follows argues that migratory patterns and migrant settlement process are two other important dimensions of variation between uncontrolled settlements, which are also fundamental in determining the growth patterns of individual subareas.

UNDERLYING DIMENSIONS OF VARIATION BETWEEN UNCONTROLLED SETTLEMENTS

Migratory pattern is a particularly important index firstly because migration (rural to urban) accounts for a very significant proportion of population growth in both uncontrolled settlement and

third world cities at large. More than 90% of the respondents interviewed in this study were migrants from rural areas.

Secondly, and perhaps more important, is that migratory pattern in terms of whether the people involved regard their stay in the city as permanent or temporary has varying housing implications in the city of migration. This study has shown quite clearly, that temporary migrants prefer to consolidate their position in the rural hometown rather than in the city of migration. This inevitably means that not all the migrants to the city strive to consolidate their stay in the city, since temporary migrants prefer the flexibility of cheap rental accommodation.

Migrant settlement patterns in the city therefore, becomes an important index in differentiating growth patterns of uncontrolled subareas, since improvement activities or the propensity to become consolidators is more closely associated with one group, the permanent migrants. Thus, the improvement potentials of individual subareas is likely to vary depending on whether the area is particularly attractive to permanent or temporary migrants.

Although the findings of this study indicates that migrants to Jos and indeed most of West West African cities, are predominantly temporary in character, the migrant stream are themselves different in terms of places of origin, ethnic and cultural relationships, educational background (thus, their relative level of participation in gainful employment which determines to a large extent relative income).

While it is generally accepted that the search for economic betterment constitutes the most significant motivation to migrate to the city, the presence of friends and relatives, proximity to areas of employment opportunities and cheap rental accommodation could enhance the chances of achieving this objective. Since migrant streams are different in terms of the variables mentioned above, their reception mode in the city is likely to vary according to the character of migrant groups. The reception areas are in turn affected by the characteristics of the incoming groups.

The initial location of any one migrant is determined to a large extent by how best his housing needs can be met. This study shows that it involves a cautious consideration of the options open to them in terms of which of the three possibilities mentioned above offers the best advantage.

The occupational concentration without ethnic concentration observed in Anglo-Jos study area would seem to indicate ^{that} the need to be within close proximity of employment opportunities played a significant role in attracting migrants to this area. This argument is also supported by the large presence of the unemployed and the least educated in the area.

On the other hand, the occupational concentration with ethnic clustering observed in Tudun Wada study area would seem to suggest that ethnic considerations more than the need to be within close proximity of places of work and job opportunities, is responsible for attracting migrants to this area. The ethnic clustering observed in the other areas would seem to suggest the same. Thus in Jos, it can

be said that ethnic consideration more than any other factor is influential in determining migrant settlement patterns.

Whereas migrant settlement process in Jos is determined by the factors mentioned above, the propensity to become a consolidator in the city is determined not by these factors but by the migratory characteristic of the individual migrants, i.e. the proportion of migrants who intend an indefinite stay in the city. The effect of these processes is to concentrate and in some cases disperse the attributes of consolidation in particular settlements of the city, creating various and varied-sub cultures within and between these settlements. The concentration of respondents who intend a permanent stay in the city and of those who have acquired and or developed their plots observed in Kabong study area can be attributed to this factor. Similarly, the concentration in Tudun Wada of migrants who intend only a temporary stay in the city can also be attributed to these processes.

The effect of varying migratory characteristics and settlement patterns on the growth and development of physical characteristics of uncontrolled settlements in regions where migration is predominantly temporary in character is better understood when compared with the situation in which migration is predominantly permanent in character.

In areas where rural-urban migration is predominantly permanent in nature, all or some of the factors governing settlement patterns in the city (discussed above) may prevail but these are not likely to have a significant varying effect on the growth process of the settlements involved since most of the inhabitants, being permanent migrants, are likely consolidators. Hence, improvement or the lack

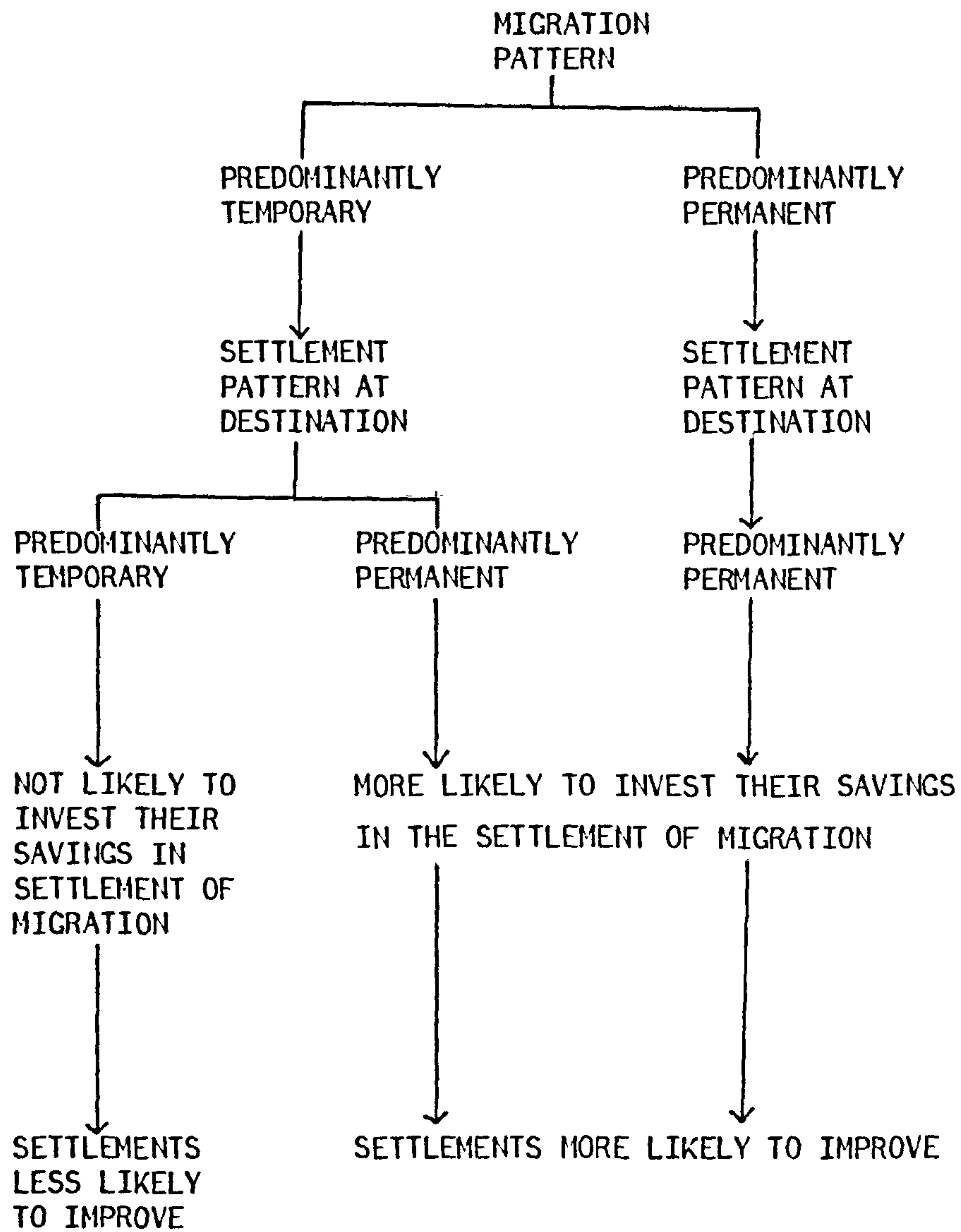
of it becomes a function of individual's economic ability. The provision of security of tenure and/or Planning Permission is thus important depending on the types of land tenure and land arrangements involved. The most fundamental difference arises from the varying migratory characteristics of the people involved. The diagram overleaf (Fig. 3) summarises the effect of migratory patterns on the growth of uncontrolled subareas.

Thus, from the results of the analyses undertaken in this study, it can be said therefore, that improvement potentials in any uncontrolled subarea is a function of the migratory characteristics of the migrants that gave rise to the settlement, since what happens in the reception node in terms of consolidation is closely associated with the initial decision to migrate.

In other words, the decision to migrate in terms of permanent or temporary migration also includes the decision regarding likely types of preferred accommodation in the city, and thus most likely areas of residence. This could either be cheap rental accommodation, friends and relatives or even areas of employment opportunities. The decision to migrate therefore includes the decision as to whether an individual migrant would strive to become a consolidator or not, which in turn determines the settlement areas and the growth prospects of the reception nodes.

It is therefore, possible to distinguish between uncontrolled subareas on the basis of the migratory characteristics of its inhabitants. Within this context, it is possible to assess not only the past but also the likely direction of future growth of individual subareas. Such an

FIGURE 3 SUMMARY OF THE EFFECTS OF VARYING MIGRATORY PATTERNS ON
THE DEVELOPMENT OF PHYSICAL CHARACTERISTICS IN UNCONTROLLED
SUBAREAS.



assessment would undoubtedly provide a significant insight into the policy dimension of uncontrolled subareas.

If the decision to migrate (permanently or temporary) is seen as verified by the results of the analyses, as indicative of certain desires then the propensity of the reception node to improve must be considered in terms of those desires since any improvement that might occur in an area would very much depend on the character of the resident population and their desires or ambitions. In activity terms, it involves subsequent action on the part of the resident population to achieve their housing desires, in which case the outcome becomes the determinant of the direction of growth in the area. The process can be represented as follows:-

ACTORS → ACTORS DESIRES → SUBSEQUENT ACTION → OUTCOME

Whereas the actors in this case are largely migrants, their desires as shown in the preceding analysis could vary depending on whether they regard their stay in the city as permanent or temporary.

Thus for improvement to occur in any uncontrolled subarea, not only are actors required but such actors must have the desire to consolidate their position in the settlement of residence. They must also take subsequent action in the way of acquiring development land and transforming such lands into some kind of shelter. The development process itself could be represented as follows:-

PLOT ACQUISITION → PLOT DEVELOPMENT STAGE → SUBSEQUENT IMPROVEMENT AFTER INITIAL DEVELOPMENT

However, if the composition of an uncontrolled subarea is such that it is dominated largely by temporary migrants, who do not as shown by the result of the analysis, strive to consolidate in the city, the chances of achieving any significant improvement through self home building is likely to be very minimal.

As mentioned earlier, within this migratory framework it is possible to determine whether or not an individual area has been improving through self built housing not only by the number of its inhabitants in owner occupation but also by the number of plots that have been acquired and are in the process of being developed.

It is also possible within this framework to determine the likely future growth pattern of an area by the number or proportion of permanent migrants within an area and the propensity of the area to attract permanent migrants. Given the likelihood of migrants to concentrate on regional or relative distance travelled and on ethnic basis, established trends are likely to be perpetuated. This proposition also assumes that in the event of upward economic mobility, individual migrants would direct any surpluses arising from such upward mobility towards the achievement of their set housing ambitions.

The findings of the preceding analyses may be generalised in terms of a typology of relatively self improving and non-self improving dichotomy of uncontrolled subareas. The relative self-improving subareas are those which are characterised largely by permanent migrants as opposed to temporary migrants. In other words, those who strive to become consolidators in the city as opposed to those who strive to consolidate their position in the rural hometowns, which also corresponds

with the reception node of short distance migrants and to some extent medium distance migrants as opposed to long distance migrants. These also correspond with areas where a large proportion of the inhabitants have acquired development land in the city as opposed to their rural hometowns.

ASSOCIATION ANALYSIS

In order to identify the relatively self improving subareas the classification procedure - 'Association Analysis' has been employed. This method has been selected for this analysis because unlike most classification procedures (which are concerned with agglomerative methods regard each individual observation as a separate group). The Association Analysis assumes that all of the individuals are in one group and proceeds to divide the group into subgroups on the basis of the Chi-square statistics for the distribution of the attributes being analysed.

Thus by adopting the approach in this study, a taxonomy of areas can be obtained based on the Chi-square statistics for the distribution of those improvement attributes in the five study areas. Association Analysis is therefore suited for this purpose of this study since it is based on the differences between attributes in their distribution over area or areas. Moreover, the discrete nature of the data obtained for this study demands the use of a non parametric analytical procedure.

Association Analysis was initially developed by two Botanists, William and Lambert (1959) to cope with the classification of plant communities. Since then it has been widely used in Geography and related fields.

The procedure Association analysis proceeds firstly by obtaining the chi-square (x^2) statistics for the distribution of each attribute among the sample population. The attribute to apply in dividing the population into two groups is then identified, based on the attribute which is most dissimilar from all the others and therefore assumed to be the best discriminator between the observations. Since the size of an individual x^2 is positively related to the degree of dissimilarity between the distribution of two attributes, then the most dissimilar on the whole is the attribute with the highest chi-square value.

The procedure is repeated separately for each of the remaining variables. The variable identified in the first iteration is no longer used in the classification since within either group there is no variance. It is either always present or always absent. The division then continues until all groups contain two or fewer numbers beyond which further classification would be meaningless. Occasionally, larger groups cannot be divided further, where the members are all completely alike.

As in the case of agglomerative classification procedures, the association analysis is faced with the problem of when the grouping should be stopped. The answer to this problem as pointed out by Gregory (1972) depends on the objective of the research (which in this is to identify those attributes identified above). However, a frequently applied rule is to stop when the maximum value of chi-square for the variable on which the division is made is less than 3.84 (that is the maximum value of x^2 to show significant difference at 0.5 level of probability at one degree of freedom). It is important to note that the choice of 0.5 level of probability is a matter of convention (Gregory, 1972).

RESULTS OF THE ASSOCIATION ANALYSIS

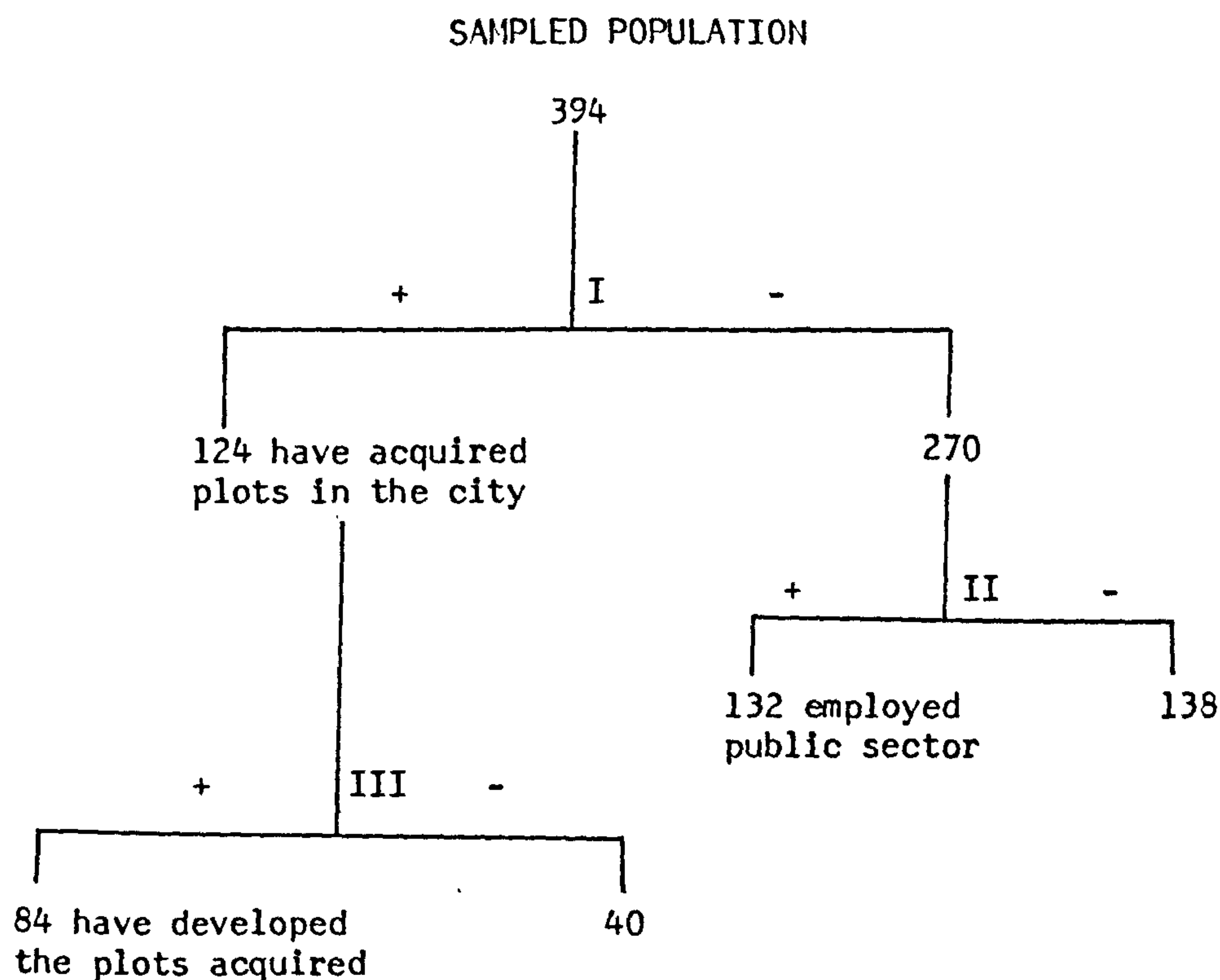
As a prelude to the analysis, all the data for the individual study areas have been combined and analysed as one data set. The purpose of this analysis is to obtain a general picture of the nature of Jos uncontrolled settlements. This is then followed by the analysis of the data for each of the areas separated for the purpose of comparison.

The results of the analysis of the combined data set shown in the dendogram, Figure 4, identified firstly, plot ownership as the best discriminant factor for dividing the 394 respondents into two groups. The result shows that 124 or 31% of the 394 respondents have acquired plots in the city while the remaining 275 have not. This represents an average of 24.8 plots per area and an average of 55 respondents who have not acquired a plot in the city per area.

The second iteration considered the 275 respondents who have not acquired plots in the city and identified employment type as the best factor for dividing the population. The result shows that 132 of the respondents in this category are public sector employees. This finding confirms the proposition made in the chi-square test that public sector employees are less stable than their counterparts in the other sectors.

Finally, the third iteration considered the 124 respondents who have acquired plots in the city and level of development of the plot acquired is identified as the best factor for dividing this group into two. The result shows that 84 or 70% of the 124 plots acquired have been developed and only 40 have not yet been developed. This represents an average of 16.8 developed plots per area.

If the number of plots already developed (thus houses built by the respondents) is accepted as an indication of the level of improvement that has taken place within the study areas and the number of plots yet to be developed as an indication of possible future improvement, then obviously the figures given above by this analysis do not provide enough support for a generalisation regarding improvement within the study areas. The very fact that building activity did not emerge as the best factor for dividing the whole sample population is indicative of how less common the phenomenon is in the city. Thus while two of the attributes of improvement have been identified amongst the respondents, the proportion of the respondents in this category represents only 31% of the sample population which does not provide adequate grounds for generalisation.

FIGURE 4ASSOCIATION ANALYSIS COMBINED DATA SET

This analysis shows, as did the previous analyses that a large proportion of the respondents have not acquired plots in the city and a significant attribute of the majority of the respondents in this category is that they are public sector employed.

ASSOCIATION ANALYSIS OF THE DATA FOR THE INDIVIDUAL STUDY AREAS

The dendograms shown below, Figures 5 to 9, are the results of the association analysis of the data for each of the areas.

FIGURE 5 ASSOCIATION ANALYSIS: DADIN KOWA SAMPLE

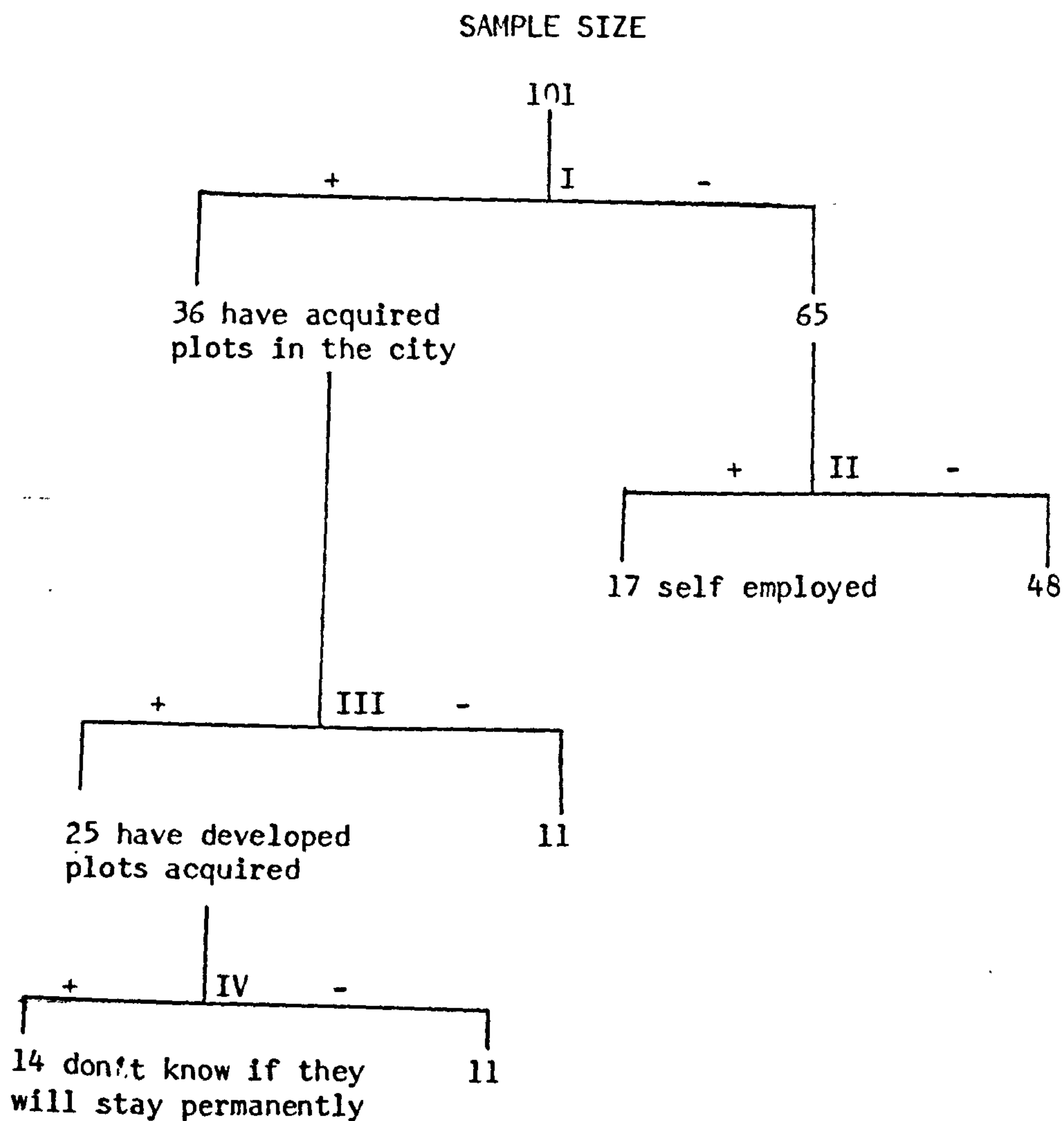


FIGURE 6

ASSOCIATION ANALYSIS: TUDUN WADA SAMPLE

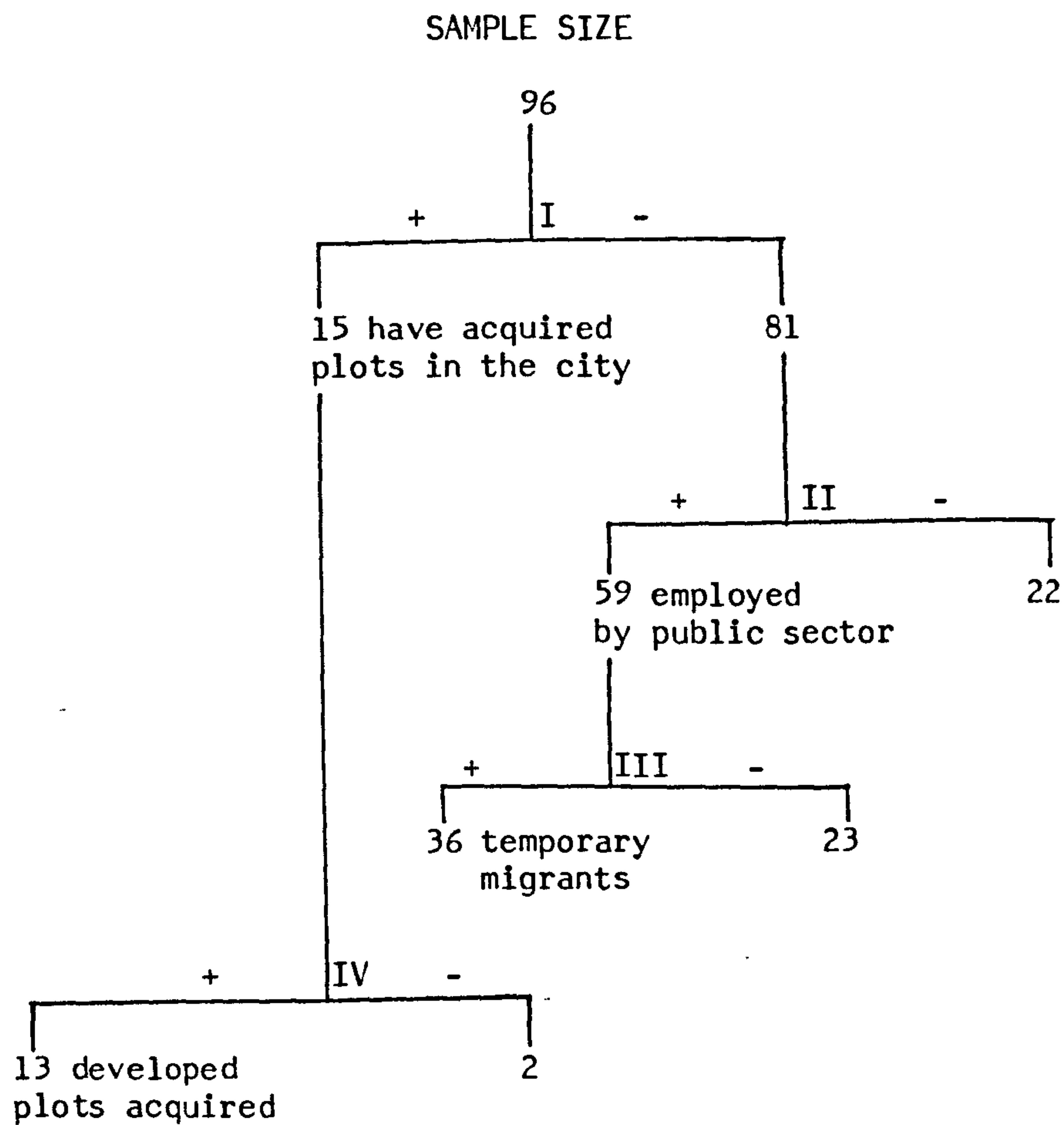


FIGURE 7

ASSOCIATION ANALYSIS: KABONG DATA

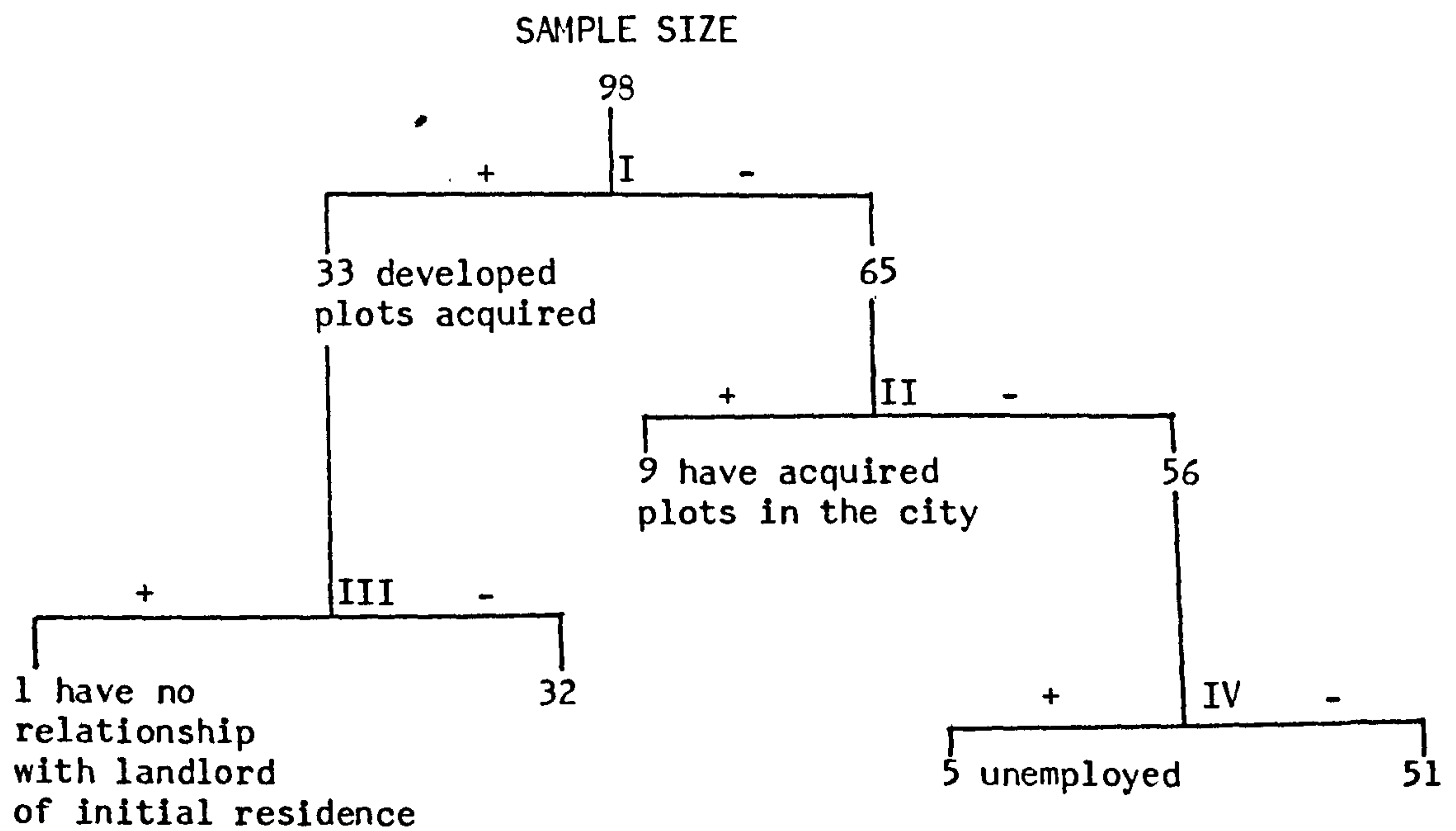


FIGURE 8 ASSOCIATION ANALYSIS: JENTA ADAMU SAMPLE

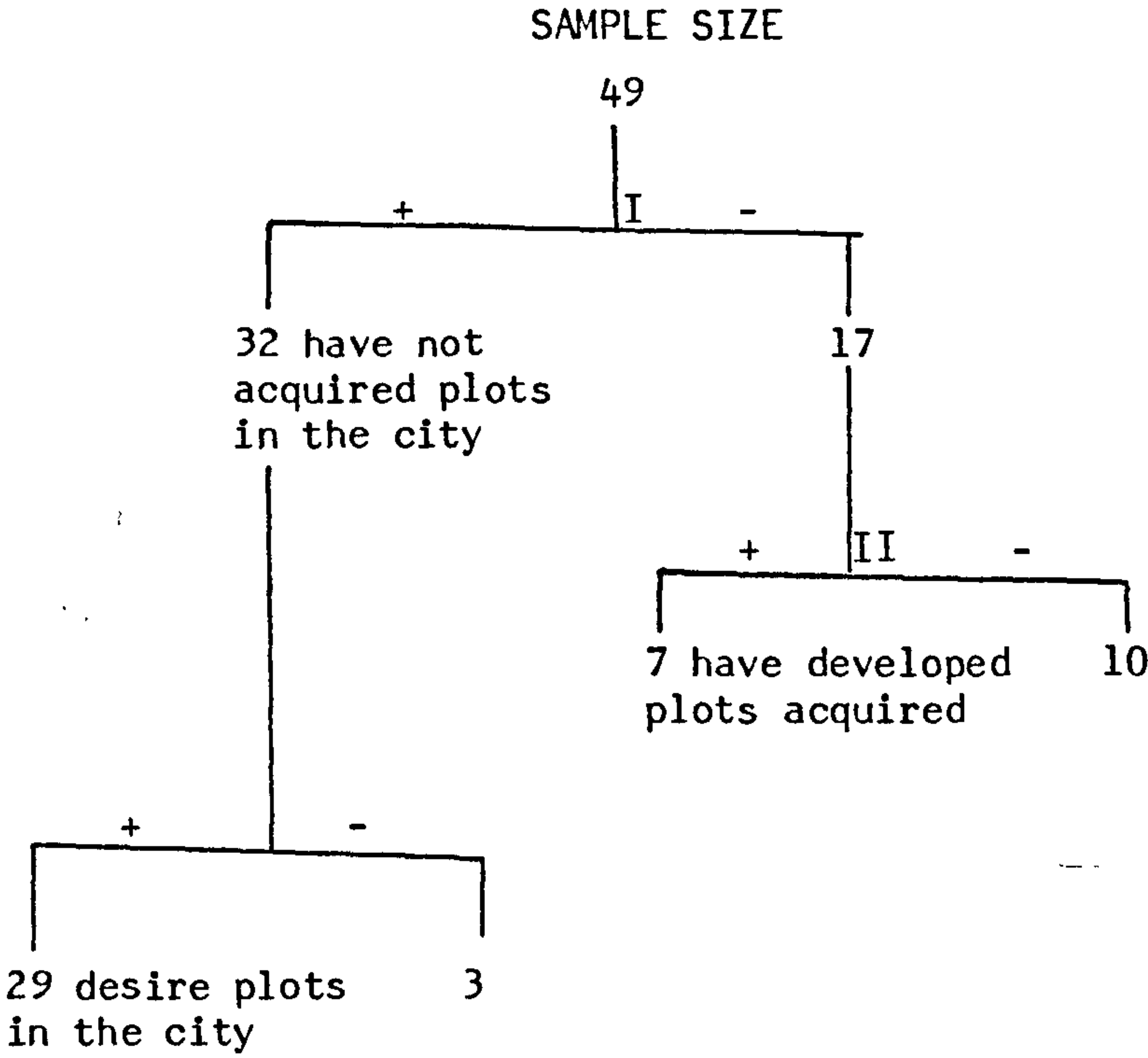
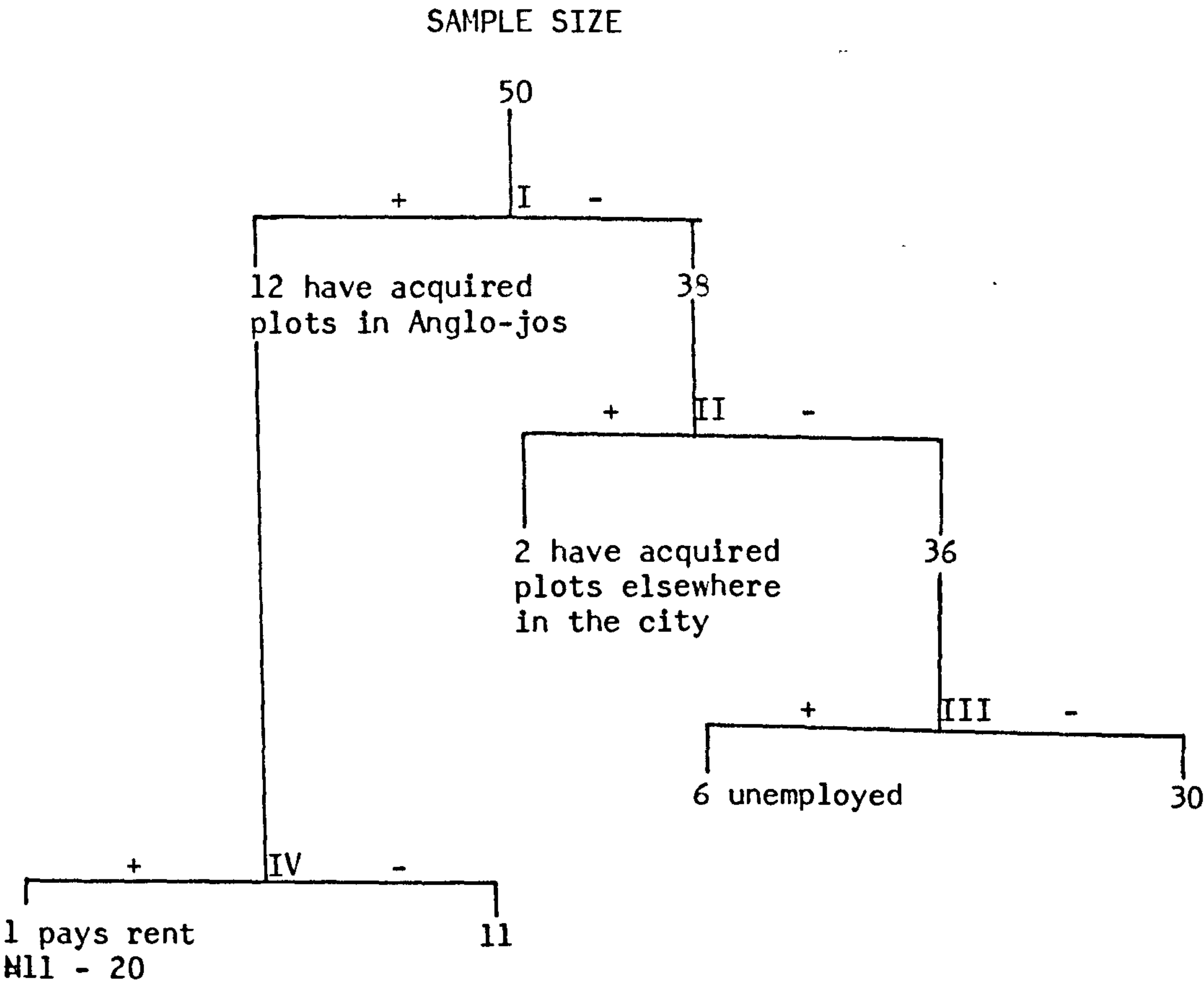


FIGURE 9 ASSOCIATION ANALYSIS: ANGLO-JOS SAMPLE



Adopting a threshold of above average distribution of improvement indices as the base for distinguishing between improving and non self improving subareas, it can be seen from the results of the analyses presented in the dendograms above that Kabong study area, more than any other, seems to have been improving.

In Kabong study area the incidence of home building is identified as the best factor for dividing the sampled population into two groups. The results show that of the 84 houses built by respondents in the city generally, 33 are located in this area. This represents 39.2% of all the houses built which is well above the average of 16 or 20%. Yet the second iteration which considered the 65 respondents who have not developed plots of land in the city identified plot ownership as the best factor for dividing this group. The results show that of the 65 respondents in this category, 9 have acquired plots and only 56 have not. These results indicate that in this area, almost half of the respondents (42 or 42.8%) have either acquired plots or built their own houses. This represents 33.8% of all the plots acquired by the 394 respondents in the city.

The presence of urban based community development group in this area and some of the confrontations which the 'Kabong development association' have had with the city authority have been discussed in Chapter Two. Obviously, the emergence of this city based development association is not unassociated with the building activities that have been taking place in this area. This also correlates with the concern by the city authority to control development in this area. The Community Development Association can be seen as an indication of the level of commitment by the inhabitants of this area to protect their

buildings from demolition or similar threats that might arise from the city authority. It would be recalled from the Chi-square test and the log-linear analysis undertaken earlier that this area coincides with the reception node of the short distance migrants and also has the highest concentration of respondents who intend an indefinite stay in the city.

Similarly, the analysis of the data from Dadin Kowa study area figure 5 bears resemblance to the pattern observed in Kabong study area. Although the incidence of home building did not feature as the best factor for dividing the 101 respondents in this area, the results of the analysis shows that plot acquisition in this area is significantly large hence its identification as the best discriminant factor.

The results show that 36 of the 101 respondents have acquired a plot in the area. The majority 65 have not. The second iteration considered the 65 respondents who have not acquired a plot in the city and identified employment type as the best dividing factor. This as shown in the dendogram indicates that 17 of the 65 respondents in this category are self employed while 48 are employed in the other sectors.

The third iteration deliberated on the 36 respondents who have acquired a plot in the city and identified 25 as having developed their plots. As shown by the fourth iteration the majority of the people in this category don't know if they would stay permanently in the city.

These results would indicate that 29.7% of the 84 plots that have been developed in the study areas are located in this area. This is

about 10% less than the rate observed in Kabong study area, but well above the average of 16.8. Thus 58 or 69.0% of the 84 houses that have been built by the respondents in the city are located in these two areas - Kabong and Dadin Kowa. These findings also correspond with the findings of the log-linear analysis which shows the association between plot ownership in the city and permanent migration to be significantly high in these two areas.

However, in Tudun Wada area the results of the analysis indicate that the best discriminant factor for dividing the 96 sampled population is plot acquisition amongst the respondents. Only 15 or 15.6% of the 96 respondents in this area have acquired a plot of land in the city. This, as can be seen is well below the average 24.8. The second iteration considered the 81 respondents who have not acquired plots in the city and employment type is identified as the best factor. The results show that 59 of the respondents in this category are public sector employees, only 22 are employed in other sectors.

A major characteristic of the respondents who have not acquired plots in the city as shown in the third iteration is that they do not intend to stay permanently in the city. The results show that 36 of the 59 public sector employees who have not acquired plots in the city do not intend to stay permanently in the city.

In the fourth iteration which considered the 15 respondents who have acquired plots in the city identified level of development of the plot as the best factor for dividing the group. The results indicate that 13 of the 15 plots acquired have been developed. This is again well below the average.

In Jenta Adamu area, the analysis shows that the 49 respondents can best be divided in terms of plot ownership. The first iteration of the association analysis identified 32 of the 49 respondents in the category of those who have not acquired plots while 17 have acquired development land. The second iteration which considered the 17 respondents identified in the first iteration as having acquired building land indicates that only 8 of the 17 plots acquired have been developed. These figures show clearly that both the plot acquisition rate and the plot development rate in this area are well below the average.

However, of the 32 respondents who have not acquired a plot identified in the first iteration, 29 wish to acquire a plot in the city. This represents a significant deviation from the patterns observed in the other areas. Considering the topography of the area, it is very unlikely that the expressed desire for plot ownership in the city could be realised in the area. Almost all the developable land available in Jenta Adamu has been taken up by development. Any future development intentions of its inhabitants must therefore take place outside the area. This rather high desire for development land within the area is not unassociated with the fact that most of the inhabitants are short distance migrants.

Lastly, in Anglo-Jos area, the analysis shows that the 50 respondents can best be divided in terms of plot ownership in the city. The results show that only 14 of the 50 respondents have acquired plots in the city. While this is well below the average, a significant feature about the plot ownership amongst the respondents of this area which the analysis identified is that not all the plots acquired are

based in the area. Two of the fourteen plots acquired are outside the area. Obviously this trend would not lead to a significant improvement in the area.

From the above analysis it would seem that only two of the five areas studied could be termed as relatively self improving. These areas are Kabong and Dadin Kowa. In these two areas, as the results of the analysis shows, a significant proportion of the respondents are in owner occupation. Moreso, a relatively significant proportion of the respondents have acquired plots which are yet to be developed. These indicate not only that the areas have been improving but also that the areas might continue to be self improving.

However, the remaining areas namely, Tudun Wada, Jenta Adamu and Anglo-Jos obviously fall within the non-self improving category. These areas are dominated by rented as opposed to owner occupied housing. Moreso, only a small proportion of the respondents have acquired plots in the city. It will also be recalled from the log-linear analysis that the association between plot ownership and permanent stay observed in these areas were relatively low.

CONCLUSION

The typology of uncontrolled subareas advanced in this chapter of the study indicates that self-help motivated uncontrolled settlements appear to be the exception rather than the rule. Most of the inhabitants of the areas are temporary migrants whose ambition is to consolidate in their rural hometown and as such might remain bridgeheaders while in the city. Their residential areas correspond with the location of

private sector built uncontrolled settlements.

Given the above situation, the role of institutionalised self help housing policy in solving the housing problems of the majority of the people is quite limited. The freedom to build policy is not likely to make a significant impact on the housing deficit. The typology formulated above shows that only in isolated cases could self help housing policy be justified. Its very existence as isolated is nothing less than a proof of the impossibility of its large scale realisation. It also points to the need for a much more flexible housing policy that acknowledges the housing needs of the majority of the people.

CHAPTER NINE

TOWARDS A POLICY FOR A MORE CONTROLLED URBAN DEVELOPMENT IN NIGERIA

This chapter of the study attempts to put forward some recommendations that might lead to a more controlled urban growth in Nigeria. Rather than make a universally applicable policy recommendation, broad guidelines for the formulation of such policies that might reduce the problem in Nigeria have been put forward in view of the types of variations observed across the third world spectrum. Variation between third world countries and regions necessarily demands that policy proposals be set within the context of the national economic and social objectives. Indeed, environmental policies as Mabogunje et al (1978) rightly pointed out, are elements of a broad measure adopted for the purpose of achieving a controlled function in accordance with some generally defined socio-economic objectives and cannot therefore be set independently from or in contradiction to, the rationale of socio-economic systems.

However, policies or strategies regarding problems arising from uncontrolled urbanisation could be represented along a spectrum ranging on the one hand from non-intervention, with the market forces acting as the sole regulator, to the direct governmental intervention in all matters affecting the environment.

Experience of the developed nation as noted by Nurudeen et al (1978) indicates that a laissez faire approach to urbanisation may produce an 'efficient' system at the expense of equity. This is because the spatial distribution in development, and the waves of

migration accompanying it tends to favour urban centres. Unfortunately, the same attitude in Nigeria and indeed most Third World countries has produced neither efficiency nor equity basically because the expansion of the economic base and social amenities of the few large urban centres to which migrants gravitate has not kept pace with the incoming of migrants to these cities. Urban unemployment and congestion which this apparently unguided movement brings suggests a need to pay greater attention to the goal of equity. In order to meet the goal of equity, it is necessary to re-assess not only the policy on industrial location but also the items that should be manufactured locally. This obviously requires extensive government intervention.

Indeed the problems of uncontrolled urban growth as analysed in this study are a clear manifestation of the failures of existing land and housing policies as well as the lack of a clearly defined urbanisation policy. It is only desirable therefore that governmental action should be initiated to solve the problems.

The changes in population growth and distribution which have produced Nigeria's pattern of urban settlement are largely the result of Federal government actions along economic and political lines. Federal political action have had a major effect on the growth of some urban centres in the country. The creation of states in 1967 and 1976 for example, affected ^{the} geographical diffusion of opportunities and complicated the patterns of flow of migrants. Similarly, the Civil War and the period of military intervention with the attendant defence spending increased economic opportunities in the new military posts or the expanded old ones.

Although the outcome of these actions are significant, they are largely unintended and have never coincided with any deliberate territorial policy aimed at redistributing the population in such a way that ensures orderly growth of urban centres.

Nurudeen et al (1978) observed that virtually all Federal government policies, seem to favour rapid growth of large urban centres, such policies are in need of critical revision to ensure the checking of the cumulative process of growth disparity among regions. Consideration should be accorded to projects that can enhance the growth of secondary cities which would serve as focal points in the migration system. Yet these cities have been ignored.

In almost all the state capitals including Jos, extension of social and municipal services have fallen far behind the pace of population growth. The growing gap in social and physical services not only inhibits economic development, but acts adversely to maintain low-income families in poor housing conditions. Local governments and municipal authorities have been unable to maintain existing services nor to extend them to those areas of the city with large numbers of migrants.

Urban population growth, regional planning and rural development are some of the areas in which positive governmental policies could assist in reducing the growth of uncontrolled subareas by controlling the urbanisation process. These factors as noted by Drakakis-Smith (1981) find their most explicit expression in national urbanisation policy which have considerable repercussion on urban development patterns. Yet national development targets in Nigeria are set along

sectoral lines without the benefits of national urbanisation policy.

Thus, the economic and political forces that have created inefficient and undesirable patterns of urbanisation in Nigeria are unlikely to change without a reversal of current trends. It is equally unlikely that a strong system of secondary cities will emerge without deliberate and consistent government intervention.

New demands are made by growing population for basic services and facilities, the extension of infrastructure and utilities, more better jobs, housing and health care and for the amenities often associated with urban living. The ability of local and national governments to meet these demands and satisfy those needs, to a large extent, determines the capacity of secondary cities to perform important development functions. Thus, improving the living conditions of the poor and raising their incomes must be regarded as long term investment in the internal economies of cities like Jos, not as welfare programmes.

The problems of polarised spatial development in Nigeria, clearly came about because of the skewed distribution of national investments and their solution may also require unequal distribution of national resources that favour secondary urban centres. It should also be noted here that a more balanced urbanisation requires not only policies that meet the needs of, and solve the problems of secondary cities, but also complementary social and economic policies that are conducive to widespread urban growth.

NATIONAL URBANISATION POLICY

As far as planning for urban and regional development in Nigeria

is concerned, there has been very little organisational framework devoted to its promotion. The basic cause of this may be that only minimal attention has been paid to this subject. At the Federal or national level, the Ministry of Housing and Environment concerns itself mainly with overall supervision of construction and building projects of the government and has nothing to do with urban and regional planning. This obviously betokens the Federal government's lack of concern for physical planning apart from its responsibility for the Federal capital.

There is therefore an increasing need for more attention to the problems resulting from large scale and unplanned growth of Nigerian secondary cities. Balanced growth as between urban and rural areas is essential if the economic and physical development of cities is not to be based on a purely urban strategy, and if the most effective use of limited resources is to be made.

The challenge for international assistance organisations and the National government is to find effective and appropriate ways to assist local governments and private developers to strengthen the housing delivery system of these cities, both through direct investments and through National policies that have spatial implications. Assistance can be provided in two areas, firstly in formulating national urbanisation strategies for developing a well integrated system of secondary cities, and secondly in assisting city governments to solve the complex problems of managing urban growth.

At the level of national urbanisation policy, the aim should be to coordinate economic and social objectives such as rural development, employment creation and regional balance. Comprehensively defined

policies in these areas are necessary as they are likely to affect substantially the type and scale of urbanisation and the economic resources available to the urban sector.

An overall strategy for strengthening secondary cities is necessary because as noted by Rondinelli (1983) and Ligale (1982) secondary cities can play important roles in balancing the distribution of urban population and economic activities, in stimulating rural development and in generating more socially and geographically equitable distribution of the benefits of urbanisation, when they are economically strong and linked to each other.

One other reason for developing and strengthening of secondary cities is to expand their capacity to perform services and production functions more efficiently and effectively. Most of the secondary cities of Nigeria including Jos, have low levels of administrative capacity, inefficient service delivery programmes and low levels of revenue raising capacity, and are dependent on the Federal and State governments for authority and financial resources to perform even basic functions. In other words they cannot easily fulfill their potential roles in absorbing rural migrants and stimulating the rural economy.

As mentioned earlier, economic and political forces are to a large extent responsible for the spatial structure of productive investments and services in Nigeria. These in turn determine the location of human resources within the country. Urbanisation policy should therefore be formulated in the light of location criteria for economic activities for the main urban centres in each region. This should specify in demographic terms objectives regarding the distribution and characteristics of the population between urban and rural areas.

In physical terms, this should provide some basis for the growth of an urban regional system while institutionally it should provide the necessary organisational framework for coordinating the policy with other sectors. This approach might aid significantly the integration of an urban-regional system on an appropriate regional and national hierarchies.

Sectoral policies of the Federal government as noted earlier especially in terms of industrial investments and infrastructural provisions are responsible for the shape and institutionalisation of the process of migration and the concentration of population that have given rise to urban uncontrolled settlements. The situation it seems, can only be reversed within the same policy context and unless such sectoral plans are supported by a nationally defined urban regional system of urbanisation, the problems associated with it cannot be resolved.

Given that Nigeria's rural-urban migration is largely temporary in character, a decentralisation of investments and infrastructural services within the urban regional system mentioned above might affect substantially the flow and character of uncontrolled settlements in urban areas. Obviously, these are long term proposals which require not only financial commitment but also change in attitude on the part of the authorities. Long established migratory flows cannot be reversed overnight.

LOCAL STRATEGIES

Positive attitudes towards urbanisation alone may not necessarily lead to controlled urban development in Nigeria. This must be accompanied by appropriate urban development strategies that makes the

required type of housing available and accessible to all groups in society. This study shows that the growth of uncontrolled development arises from the failures of current land and housing policies to acknowledge the housing needs and desires of certain groups in society.

At the local level (or city level) which is in fact the context of this study, the success of any urban development strategy for a more controlled urban growth would depend very much on its relevance to the local situation. Local strategies must therefore be based on a clear understanding of all the processes involved in the growth of individual subareas and those factors that influence the growth of the city in question. Indeed, one of the objectives of this study was to highlight some of the apparent variations that can be expected between uncontrolled subareas even those of the same city with the view that a greater understanding of the varied processes involved and the varied nature of the areas would lead to a better and more effective policy action.

The variation observed between the five study areas in terms of their capacity to improve through self help housing exemplifies not only the need for local strategies to be specific as well as flexible but should also be capable of being continually updated. Yet, they must also emerge from a broader set of national criteria for the reasons mentioned earlier.

Flexibility is an essential element of both housing programmes and in investment policy not only to cope successfully with the constantly changing socio-political and economic circumstances but also to meet the varied housing requirements of the various groups in society. The findings of this study has shown quite clearly that migrant groups

make varied housing demands on the city of migration and that these varied demands affect migrant areas of residence in the city. These findings demand that local housing and urban development strategies be specific not only to meet the housing needs of the various groups but also to solve the varied problems of the settlement areas in the city.

The disillusion with housing investment in Nigeria can be attributed largely to the conceptual inadequacies which prevents policy makers from appreciating the alternative sources of low-income housing open to them and from estimating the best way to spend limited financial resources. There is only a limited appreciation of the various sources which can provide low cost housing and the contrasting role which each of these play at different stages in the development process.

The following section identifies and briefly considers some of the major alternative sources of low cost housing in Nigeria within the context of the findings of this study. The present and potential roles of each of the alternatives in meeting the needs of the urban poor, together with their relationships are also briefly considered.

ALTERNATIVE SOURCES OF LOW COST HOUSING

As mentioned in Chapter Three there are three main sources of housing supply in Nigeria. That is, the public sector housing, the private sector housing and the self provided housing sector. Each of these would be considered below.

PUBLIC SECTOR HOUSING

Government or public sector housing in Nigeria has traditionally gone at subsidised rates, to administrators and professionals, leaving ordinary workers especially the low-income groups and the unemployed (except those employed by the Railways and Uniformed Services) to fend for themselves in the private market. Government housing investment in low-cost housing which could benefit the low-income groups has been very limited and often wasted yet again on expensive projects designed to impress the electorate rather than meet real needs. It is for this reason that government housing, although relatively few in number tends to be prominent in the townscapes of Nigerian cities. Government housing schemes are characterised by capital intensive, technologically sophisticated industrial methods.

The principal defects of this approach to housing is the cost. The very high costs involved reduces not only the number of units that can be produced but also the number of low-income households that can benefit from such schemes. Even where generous subsidies are made, as in the case of the 250 low-cost housing units in Jos, rents are usually relatively high, with extra-charges often made for water, electricity and such basic facilities. In addition, hidden expenses are also involved because often these houses are located in the urban periphery. The costs of journey to work or places of work opportunities increases and the number of part-time jobs for children and wives are drastically reduced.

There is no doubt whatsoever, that government housing schemes can be an important source of housing the urban poor but present

practices have made the limited housing provided by the government inaccessible to the people that needed it most. A reduction in the standard of housing which the government provides will not only lead to the construction of more housing but is also likely to bring rents within the reach of the urban poor. Moreover, such cheap rented accommodation, if provided, is more likely to satisfy the felt needs and desires of the majority of the people who are temporary migrants.

However, given Nigeria's rural-urban imbalances, a lot of potential exists for rural-urban migration. It is quite doubtful that the government alone can provide adequate housing for all the urban population.

PRIVATE SECTOR

Private sector housing here includes not only that which is constructed through normal institutional channels and offered for sale or rent on the open market, but also those built for the same purpose in the uncontrolled settlements. This rather broad definition has been adopted because the evidence from this study shows that a large majority of the housing found in the study areas were built for rented purposes.

At present, although the private sector builds most of the housing in Nigeria, relatively few of these new units fall within the financial reach of the urban poor, with the obvious exception of those constructed in the uncontrolled settlements. On the other hand as the conventional private sector housing becomes more aged, suffers neglect and/or subdivision and approaches a substandard condition, it could play an

increasingly important role in housing the low-income group.

Yet, it is widely assumed that the private sector plays and will continue to play a minor role in housing the low-income group. In general, this may be true since the profits which can be made from low cost housing construction are relatively small, but then, not all private construction is undertaken by large scale firms using modern capital intensive techniques and looking for large profits.

The majority of the private companies in Nigeria, consist of a few workers, building houses on direct commission from the purchasers or for rented purposes rather than on speculation. There are also a considerable number of unregistered builders organised by foremen who in turn are legitimately employed, again directly by purchasers or architects, to construct houses which in every other respect comply with construction standard but lack planning permission.

Indeed, the predominance of cheap rented accommodation in the five areas studied in Jos is an indication of the enormous contribution which the private sector has made in providing housing for the urban poor. The predominantly temporary character of the population of these subareas also indicates the extensive market available for cheap rented accommodation. The private sector therefore, contains far more potential for low cost housing construction than is generally recognised. Admittedly, it is unlikely that the private sector would produce houses for the most destitute of the urban poor, but there might be a more suitable market amongst the low-income households characterised by stable employment, rising aspiration. It must be noted at this point that private sector concentration on the lower middle income families is unlikely to lead

to a downward filteration of vacated dwellings. There is such a general shortage of housing for these households that any increase in production will be absorbed within the group alone.

The identification of the target population for increased private sector production is of crucial importance since profit margins on individual units will be small and large developers would require as extensive a market as possible. On the other hand, smaller producers may be content with a more modest output. The size of the target population will depend on the price households can afford to pay, the cost at which the units can be produced and the profit margin permitted.

In general terms, these factors can be brought closer together by a reduction in building costs through reduction in standard of housing construction and in the standard of services provided.

SELF HELP HOUSING

As mentioned earlier, the concept of aided self-help housing is based on the premise that all non-conventional housing is a normal response to housing shortages and indicates the determination, effort and ability which the urban poor invest in order to consolidate and improve their life in the city. It is proposed therefore that such people should be assisted to house themselves. The starting point of any such policy as noted by Martin (1982, p.264) is the pressure and expressed wishes of the residents themselves. Thus, self-help and mutual help are fundamental to the success of any such policy.

However, as noted in Chapter Eight, the data from Jos shows

that the desire of building ones home in the settlements of migration did not coincide with the views and experience of the majority of the people. Indeed, the predominantly rented accommodation found in the study areas especially in Tudun Wada, Jenta Adamu and Anglo-Jos, study areas, indicates the limited role which self help housing has played in housing the urban poor in Jos. The predominantly temporary character of the population of these areas also depicts the relatively limited potential available for aided self help housing.

This should not, however, be taken to imply that self-help housing has not contributed towards solving housing problems of the poor in Jos, or that it has no potential contribution to make. Indeed, the presence of a significantly large proportion of respondents in owner occupation found in Kabong and Dadin Kowa study areas as well as the significantly large concentration of permanent migrants (or potential consolidators) observed in these areas are indicative of some of the housing contributions made by this sector as well as the extent of its potentials. The existence of these areas on non-public land indicates that some kind of security of tenure is involved. What is required in these areas, is the provision of the necessary planning permission and the provision of basic infrastructural services. Efforts in these directions would benefit from the resourcefulness of the people.

The lesson that emerged from this rather brief consideration of the alternative sources of low-income housing is that there is no single solution to the urban housing problem. Obviously, a pursuit of the aided self help housing policy as indicated by Turner (1968) is not likely to meet the housing needs and ambitions of the majority of the people. The data from the study areas show that there is no adequate basis for a general application of this policy. The sporadic occurrence

of self help housing practices between the study areas requires that the application of the policy be sporadic to coincide with the occurrence of mutual help and self help practices. Similarly, it is not likely that the government would be able to provide all the housing required to house the low-income groups, while emphasis on the provision of private sector cheap rented accommodation alone would ignore the housing needs of potential consolidators as well as the benefit which could be derived from self-help housing at a time when resources are most scarce.

A corollary to this is that, housing programmes must, as a necessity, aim at being comprehensive, drawing on all possible sources of low-income housing so as to meet the housing needs and ambitions of the various groups in society. They must be flexible enough to adjust to changing circumstances and they must be appropriate to the resources at hand.

In general terms, the various alternative sources of low-cost housing can be brought closer together in a comprehensive policy by a reduction in building costs through reduction in the standard of services provided, the standard of housing construction and adequate supply of land for housing in major cities of the country. These objectives should be incorporated in the policy of strengthening a system of secondary cities in Nigeria.

However, any policy proposal (such as the ones proposed above) which hopes to redress the housing problems of the low income groups in Jos, must seek first and foremost a reappraisal of the regulations governing mining activities (within and around the metropolitan area) which have contributed significantly in halting the supply of land for

housing development in the city. As mentioned in Chapter Three, large tracts of unexpired mining leases remained vacant and unutilised (often under the jurisdiction of the prospecting companies) who are reluctant to release them although plans for recovering the mineral resources have long been abandoned. An inventory of such lands should be prepared and acquired for low-income housing if the problem of uncontrolled development is to be arrested.

The above proposal calls for a forum comprising the Plateau State Ministry of Lands and Survey, the Jos Metropolitan Authority and the Federal Department of Mines and Power, not only for the determination of areas that could be compulsorily acquired but also for the purpose of preparing a long term plan for land acquisition and development. These should be based on projected needs and the working of mining areas.

In seeking to quantify the land needs of the low income groups, the location of development land for low-income housing neighbourhoods must be a prime consideration. To ensure that land for low income residential use is distributed throughout built up areas with good access to income earning opportunities, all lands occupied by existing settlements which can continue to be in residential use can be delineated for low income housing.

CONCLUSION

This study has explored the effects of varying migratory characteristics on the growth and development of uncontrolled settlements of a secondary city with the hope of increasing our understanding of the varied nature of these subareas. It is hoped that the findings of this research would be found useful in both substantive and methodological grounds. Most of the research that has been done on African cities, especially those of West Africa, are based almost exclusively on the capital cities, where most of the benefits of economic development has been concentrated. Yet secondary cities of Nigeria and other Third World countries, have not only been growing rapidly in both numbers and population but also have extensive and spreading squatter and/or uncontrolled settlements.

This study shows that uncontrolled settlements in Jos, as in other secondary cities, emerged largely as a result of rapid urbanisation. However, it is not merely the pace of urbanisation that presents growing problems, but also the pattern of urban population concentration and the social and economic inequities usually associated with such spatial polarisation as well as the varying character of rural-urban migration that have affected in varying ways the growth pattern of urban uncontrolled subareas in both the capital and secondary cities.

While the capital cities also have concentration of national resources and social overhead capital vastly greater than their share of the national population, the middle level urban centres including the secondary cities that could absorb more migrants and create a

more balanced distribution of urban population are ignored and remain extremely weak. Secondary cities of Nigeria, such as Jos, have played a relatively weak role in absorbing population increases and in creating a more balanced distribution of population.

While the population increases in all the secondary cities of Nigeria (put together) is probably more than the growth of the population in Greater Lagos, the capital city has been able to assimilate more of its population increases than the secondary cities partly because certain types of housing which are found in the capital city are largely absent in the secondary cities. Few of the secondary cities have large scale inner city tenement slums which can absorb large numbers of newly arrived migrants. Very few of the secondary cities in Nigeria have received investments in housing and infra-structural services of the scale the capital cities have. As these cities grow, they face more complex and serious physical problems. Planning effectively for their physical development, is often constrained by the way in which their physical growth occurred - usually by accretion rather than through transformation.

In cities such as Jos, that expanded through the addition of new functions and the segregation of social and economic activities in different districts, some areas of the city assumed a distinct social characteristic, while others acquired a mixture of those found in other parts of the city. In this way, it is often difficult to prescribe physical controls for the physical development of the city as if it were a homogeneous entity. Each subarea of the city must be analysed and planned individually.

The growing social, economic and indeed physical problems of secondary cities in Nigeria inevitably challenges the contention of many economists that the concentration of capital investments in the largest metropolitan areas is the most efficient strategy of promoting development and that high rates of output resulting from such a strategy will automatically reverse spatial polarisation and spread the benefits of development through trickle-down effect.

Although this study shows that the uncontrolled settlements in Jos, emerged largely as a result of rapid urban growth, the settlements are themselves different in terms of the characteristics of their inhabitants and their growth processes. Varying migratory characteristics of the inhabitants affects significantly the character and the development of physical characteristics of uncontrolled subareas in both capital and secondary cities. Indeed, it is the migratory characteristics of the people involved that determines whether or not they are likely to invest their savings in consolidating their stay in the city.

However, the intra-urban mobility model which postulates a relationship between rural-urban migration, upward social mobility, intra-urban mobility and the growth of uncontrolled subareas assumes explicitly that the inhabitants of these settlements are necessarily similar in their migratory characteristics, housing needs and housing ambitions, their reasons for inhabiting an uncontrolled subarea and therefore that the settlements are essentially synonymous in their growth characteristics. It also assumes that Third World cities generally, have a similar capacity to accommodate newly arrived migrants or population increases.

The findings of this study show that most of the assumptions of the intra-urban mobility model do not hold true for the city studied. The inner city wards of Jos, do not appear to be the main reception area of the newly arrived migrants to the city. Indeed, most West African cities have no inner city tenement which could provide cheap initial accommodation for newly arrived migrants. This is even moreso in the secondary cities such as Jos. The inner city neighbourhood of the 'Native Town' as mentioned in Chapter Three, did not benefit from Colonial housing regulations, densities are consequently high in these areas and the lack of accommodation in the city generally has led to very high rents in the inner city areas. While capital cities with much larger core areas may be capable of providing cheap accommodation for the newcomers the secondary cities with much smaller and often congested cores do not provide equally the same opportunities. Cities, even those of the same country may vary in their capacity to absorb newcomers or population increases.

Consequently and contrary to the assumption that the city centre is the reception area of newly arrived migrants, as might be the case in a capital city, the evidence from this study indicates that a large majority of the newly arrived migrants to Jos, moved straight into one of the peripherally located uncontrolled settlements of the city. These areas are the main port of entry of the newly arrived migrants. The uncontrolled settlements did not therefore emerge as a result of intra-urban movements from the inner city, neither do their growth processes coincide with social upward mobility.

The main attraction to the study areas on the part of the newly arrived migrants as indicated by the data are the cheap rented accommodation

that could be found in these areas as opposed to the inner city and the presence of friends and relatives who are prepared to offer free initial accommodation and assistance in securing a job. The migrants to Jos, generally appear to have a well defined intentions, contacts and destinations leading to ethnic or regional spatial clustering within uncontrolled subareas. The ethnic spatial clustering observed in most of the study areas (with the exception of Anglo-Jos area) indicates not only that newly arrived migrants fit into established residential patterns but also suggests that the rural-urban migration involved in the growth of these areas is not an aimless and spontaneous one. Ethnic relationships and the availability of cheap rented accommodation are the two most significant factors in the choice of place of residence by newly arrived migrants to Jos. These two reason also account for why a majority of the respondents stay in an uncontrolled settlement and not the desire for house ownership in the area.

Although the settlement patterns observed in some of the study areas (e.g. Anglo-Jos, Tudun Wada) indicate some occupational clustering suggesting the possible significance of their locational proximity to employment areas in determining the choice of place of residence, the patterns observed do not strictly correspond with the intra-urban mobility assumption of a centrally located employment. This is not unassociated with the decentralisation of employment areas from the city centre to the periphery. The influence of locational proximity to areas of employment opportunities in determining areas of residence appears to be evident only in one of the five study areas, namely Anglo-Jos, where occupational concentration is accompanied by ethnic heterogeneity and high concentration of the unemployed.

Although occupational clusters have been observed in the other study areas, the presence of ethnic clustering in these areas indicate that such occupational clusters are more likely to have developed as a result of the dependence of newly arrived migrants on friends and relatives for securing jobs in the city. Thus locational proximity to areas of employment opportunities has only a limited influence on the choice of residential areas by the newly arrives groups in Jos.

Similarly, the assumption that the typical rural-urban migrants will be likely to commit themselves strongly to their new places of residence and aspire to move up the social hierarchy in the way of building their own houses, does not appear to fit the data for this study. A large majority of the respondents regard their stay in the city as temporary. They do not wish to consolidate their stay in the city, instead they prefer cheap rented accommodation. Consolidation through house building for a majority of the migrants to Jos, is directed towards the rural hometown.

The chi-square analysis undertaken of the data shows that contrary to the assumption that all migrants strive to consolidate their stay in the city, the propensity to consolidate is associated only with those migrants who intend an indefinite stay in the city. Yet the majority of the respondents are the temporary migrants. The results of the analysis also shows that the temporary migrants to Jos are strongly associated with rented accommodation and the propensity to consolidate in their rural hometowns.

A corollary to these findings is that the bridgeheader-consolidator dichotomy of the intra-urban mobility model cannot be applied within the

context of Jos (where rural-urban migration tends to be largely temporary in character), without modifications since the bridgeheader temporary migrants are likely to remain bridgeheaders while in the city. This also indicates that the intra-urban mobility model has only a limited general application. The validity of the model is limited to the context of a predominantly permanent migration since the housing priority model coincides only with the views and experience of permanent migrants. The intra-urban mobility model does not therefore explain adequately why temporary migrants might not indulge in self-help housing or strive to consolidate in the city given apparent upward social mobility.

The growth of uncontrolled settlements and the whole question of low income housing policy in terms of self help housing development, especially in West African cities, are issues which are, and will continue to be affected by the nature of rural urban relationships. Consequently analysing the growth processes of these uncontrolled sub-areas via ~~the~~ migratory character that gives rise to each area is essential and indeed desirable not only because rural-urban migrants account for a significantly large proportion of the population of both the areas and the city at large but also because such a distinction between permanent and temporary migrants leads to a better understanding of the various ways in which migrant groups perceive the urban environment and how their perception in turn affects their settlement areas. Although the extent to which duration of urban residence effects temporary migrant's perception of the urban scene remains to be tested, the distinction between permanent and temporary migrants has more practical application and validity than the bridgeheader-consolidator dichotomy in explaining the varying nature of uncontrolled subareas in Jos in terms of why some might improve while others may not.

Methodologically, this study has shown that varying migratory characteristics as distinguished above and migrant settlement pattern in the city, a corollary, are the two most important factors in differentiating between uncontrolled subareas, in terms of why some areas might improve while others might not.

Migratory characteristics are important factors because (as shown by the chi-square analysis, the log-linear analysis and the association analysis) intended length of stay in the city depicts certain housing needs and housing ambitions in which the desire to consolidate in the city through self built housing is associated mainly with permanent migrants, while temporary migrants prefer cheap rented accommodation. Housing needs and ambitions of the migrants in turn determines reception areas as well as the growth and development of the settlement areas.

The log-linear analysis showed quite clearly this pattern of dependency relationships in which migratory characteristics, settlement patterns and the development of physical characteristics of the study areas are functionally related. The results of the association analysis also exemplifies the significance of varying migratory characteristics in distinguishing between uncontrolled subareas in Jos. The distinction between permanent and temporary migration thus provides a framework for determining the varying housing demands that might arise, the varying types of settlements that might arise and a framework for understanding the development processes of uncontrolled settlements, thus providing an insight into the appropriate policy dimensions of the problem.

Given that the propensity to consolidate in the city is not common to all migrant groups, settlement patterns in the city of migration becomes an important variable in determining the growth prospects of uncontrolled subareas. This pattern of association also explains why uncontrolled settlements in regions such as Latin America (where rural-urban migration is predominantly permanent) tend to be self-improving. However, in regions such as West Africa, where rural-urban migration is predominantly temporary in character settlements of migration may not be as self improving since the preference and indeed most of the housing in the uncontrolled subareas tend to be rented accommodations. A distinction must therefore be drawn between uncontrolled settlements that are largely dominated by temporary migrants and those dominated by permanent migrants. Also between settlements that are largely self built housing and those that are largely built for rented purposes.

Although the results of the log-linear analysis and those of the association analysis indicate that Kabong study area and Dadin Kowa study area could be classified as relatively self improving corresponding with some ethnic clustering and the reception nodes of short distance and medium distance migrants respectively, the extent to which distance factors influence the propensity to consolidate in the city remains to be tested. Similarly, the role of employment by sector on the propensity to consolidate requires further investigation although the results of the analysis undertaken seems to indicate that public sector employees may be less stable than their counterparts in the other sectors.

The way in which newly arrived migrants are able to lodge with kinsmen, even complete families and sometimes for months, coupled with

the preponderance of renting rather than owner occupation, and the frequency with which large households are renting only a room rather than entire houses raises questions as to whether the housing crises in the West African cities is not often over-stated. The findings of this study shows that housing is a less important factor in the standard of living and in the self-image of the people of Jos especially the temporary migrants.

It is clear from the findings of this study that renting will remain the norm for most of the temporary urban dwellers in Jos, it is also clear that this depends on the continued existence of the house-owning minority who have a critical role to play in the growth of the city. Yet a majority of the house-owning group are only a little more prosperous than their tenants and sometimes depend upon their rents for a substantial part of their income. The extent to which this house owning group can provide for the housing needs of the ever increasing urban poor without assistance from other sectors, is a matter for further investigation. Similarly, the extent to which kinsmen would continue to accommodate newly arrived relatives as well as the effects of prolonged urban residence on kinship relationships are matters for further investigation.

Whereas, this study has focused on patterns of migration and how this may lead to variation in the development of physical characteristics in uncontrolled subareas, migratory pattern is but one of the sources of variation between uncontrolled settlements generally. The land aspects of these areas is another source of variation that could significantly influence the development of physical characteristics of uncontrolled settlements. Yet, the very many forms of land tenure

systems, the very many forms of arrangement for access to land for uncontrolled development and the effects which these might have on the development of uncontrolled subareas are only gradually becoming understood. They need to be better understood since each land tenure system and arrangement for access to land for uncontrolled development has its own implication for the growth prospects of the area and for the scope and success of governmental policies.

A common feature of most definitions of uncontrolled settlements is that they suffer from both illegality of occupation of land, and yet these definitions often include settlements such as those in Jos, where the purchase of land is involved as well as the use of customarily owned lands. In these contexts some legality of occupation is involved. What is lacking is the planning permission from the city authority. Thus, in addition to the distinction made earlier between self built settlements and settlements built for rented purposes, a distinction has to be made also between squatter settlements and settlements that have some legal base but lack planning permission. Each of these aspects have implications for the type of corrective policies that might be employed.

While squatter settlements may be more closely associated with the context of predominantly permanent migration and public land ownership, it is not strictly restricted to these situations. Thus, the relationship between migratory patterns and the type of housing demands they create, land tenure system, the various avenues they create for access to land for uncontrolled development and the various types of settlements that might arise within a particular context of migration, needs to be clearly understood. Only when these patterns

of relationship are understood can it be possible to formulate a theory or theories regarding the growth processes of uncontrolled subareas.

The findings of this research also suggest that in approaching the issue of uncontrolled development, it is for the time being unsafe to generalise regarding the nature of the problem with a view to obtaining a formula which can solve the problem once and for all or that can be applied universally. The varied nature of the processes involved demands that we should nurture and develop our ability to respond more flexibly and more specifically in a dynamic world where change and/or variety appears to be the order of the day.

No significant change can be expected unless policies are specifically designed to precise migratory characteristics involved, the land tenure and the various arrangements for access to land involved in the areas concerned. Policies and programmes that show no promise of providing people with the type of housing they need particularly with respect to financial resources and housing ambition cannot be considered to contribute to the primary objective of achieving a controlled urban development which provides adequate and appropriate housing for all groups in society.

The lesson that emerged from the discussions of the various alternative sources of low-income family housing in Nigeria is that there is no single solution to the urban housing problems, especially those of the secondary cities. Housing programmes must therefore aim at being comprehensive, drawing on all possible sources of low-income housing not only to meet the housing needs of the various groups in society but also to satisfy the prevailing conditions in individual areas

of the city. In other words they must be flexible enough to adjust to changing circumstances.

The various sources of low-income housing can be brought closer together in a comprehensive policy by a reduction in building costs through reduction in building standards, and the level of infrastructural services provided and an adequate supply of land for housing in the secondary cities of the country. These objectives, if incorporated in the proposed policy for strengthening a system of secondary cities, might increase the capacity of these cities to absorb population increases with minimum uncontrolled urban growth and might also lead to a balanced spatial distribution of population nationally.

Policies of strengthening a system of secondary cities should, in physical terms, provide some basis for the growth of an urban regional system, while institutionally, it should provide the necessary organisational framework for coordinating the policy with other sectors. This approach is likely to aid significantly in the integration of an urban-regional system on the appropriate regional and national hierarchies.

Sectoral policies of the Federal Government in terms of industrial investments and infrastructural provisions are largely responsible for the nature and institutionalisation of the process of rural-urban migration and the concentrations of population that have given rise to urban uncontrolled settlements. The situation it seems, can only be solved within the same policy context by supporting such sectoral plans with a nationally defined urban-regional system of urbanisation.

Some authors have argued that only radical structural changes can be expected to ameliorate the problem of uncontrolled urban

development. Yet even radical changes will only be a meagre step in a long process of change. They will as always require further learning as well as further corrective actions. Progress will only take place in incremental steps as incremental increases in understanding of the problem scenario is made.

REFERENCES

Abiodun, J.O. (1976) 'Housing Problem in Nigerian Cities' Town Planning Review Vol.47, pp. 339-347.

Abu-Lughod, J. (1961) 'Migrant adjustment to city life. The Egyptian case' American Journal of Sociology. 67, p.22-32.

Abrams, C. (1963) Housing in the Modern World. London, Faber and Faber.

Adeniyi, E.A. (1976) 'The management of urban and regional planning in Nigeria.' Quarterly Journal of Administration Vol. 16, 1976, pp.399-408.

Agboola, S.A. (1961) 'The Middle-belt of Nigeria - The basis of its Unity' Nigerian Geographical Journal Vol.18 No. 2 pp. 111-120.

Aldono, J. (1962) 'Urbanisation, the extended family and kinship ties in West Africa' Social Forces Vol. 41 OCTOB 1962 p.6-12.

Aluko, T.U. (1964) 'Problems of Housing and Town Planning in Nigeria' Journal of Nigerian Medical Association.

Andrew, F.M. and George, W. (1971) 'The Squatter of Lima: Who they are and what they want' Ekistics 183, 1971, pp. 132-136.

Andrew, P. et. al. (1972) 'Squatter Manifesto' Ekistics 201 pp.108-113.

Angel, S. (1983) 'Land Tenure for the Urban Poor' in Land for Housing the poor (ed) Angels et al (1983) pp. 110-143.

Awotona, A.A. (1975) 'Financing appropriate housing in Nigeria'. Ekistics, Vol. 44, No. 261 pp. 101-4.

Atkinson, G.A. (1961) 'Mass Housing in rapidly Developing Tropical Area' Town Planning Review 31(1960-61) p. 86-101.

Ayeni, B. (1979) Concepts and Techniques in Urban Analysis Croom Helm, London.

Bairoch, P. (1973) 'Urban unemployment in Developing Countries' International Labour Office Geneva.

Balan, J. (1970) 'Migrant-native socio-economic differences in Latin American cities. A Structural Analysis' Ekistics 30 pp. 398-406.

Balandier, P. (1966) 'The Colonial Situation: A theoretical approach' in Wallerstein, I. (ed) Social Change. The Colonial Situation. London, Wiley.

Banton, M. (1957) West African City, London, Oxford University Press.

Baross, P. (1983) 'The Articulation of Land Supply for popular settlements in Third World cities' in Angel et al (ed) Land for Housing the Poor, pp. 180-210.

Bhapkar, V.P. and Koch, G.G. (1968) 'On the hypothesis of 'no interaction' in multidimensional contingency tables' Technometrics, 10, 107-124.

Berry, B.F. (1973) The Human Consequences of Urbanisation, New York. St Martin Press.

Bonilla, F. (1964) 'The Urban Worker' in Johnson, J.K. (ed) Continuity and Change in Latin America. Stanford University Press pp.186-205.

Bose, A (1973) Studies in India's Urbanisation 1901-1971, McGraw Hill.

Birch, M.W. (1963) Maximum likelihood in three-way contingency tables Journal of the Royal Statistical Society, Series B. 25p 220-33.

Bishop, Y.M.M., Fienberg, S.E. and Holland, P.W. (1965) Discrete Multivariate Analysis, Cambridge, MIT press.

Breese, A. (1969) The City in Newly Developing Countries. Prentice Hall.

Bryant, J. (1979) 'Why self help housing is necessary - but difficult' in Norwood, H.C. YAGI-AMBU Special issue. Urbanisation and Housing in Papua New Guinea. Vol. 6. No. 3-4, pp.25-34.

Buchanan, K.M. (1953) 'The Northern Region of Nigeria - The Geographical Background of its political duality' Geographical Review, Vol.43, pp.451-473.

Bujra, J.C. and Gulliver, P.H. (1973) 'The politics of property: A study of an urban renewal scheme in Nairobi, Kenya'. London Social Science Research Council. Mimeographed.

Burgess, R. (1982) 'Self Help Housing Advocacy: A curious form of radicalism' A critique of the work of John F Turner in Ward, P. (ed) Self Help Housing, pp. 54-97.

Burns, L.S. and Mittelbach, F.G. (1972) 'A House is a House is a House' Industrial Relation, Vol. 11. p407-21.

Cain, A. Afshar, F. and Norton, J. (1976). 'Indigenous building and the Third World', Ekistics, Vol. 14 No. 242, p.29-32.

Caldwell, J.C. (1969) African Rural-Urban Migration. The Movement to Ghana's Towns. New York, Columbia University Press.

Casasco, J.A. (1970) 'Social functions of Slums in Latin America'. Ekistics, 28(166) pp. 54-56.

Chana, T. and Morrison, H. (1973) 'Housing Systems in the Low Income Sector of Nairobi. Kenya'. Ekistics, 36, p.214-221.

Church, R.H. (1959) 'West African Urbanisation - A geographical review' Sociological review, 7. pp. 15-28.

Cochran (1954) Some methods of strengthening the common χ^2 Tests. Biometric, 10, 1954. p.412-451.

Cole, R.L. (1970) Citizen Participation and Urban Policy Process. Lexington, Mass H.C. Swindon Book.

Connolly, P. (1982) 'Uncontrolled Settlements and Self Build: What Kind of Solution? The Mexico City Case in Ward, P. (ed) Self-Help Housing, pp. 141-174.

Correa, C.M. (1976) 'Third World Housing, Space as a resource'. Ekistics, Vol. 41, No.242, pp.33-8.

Crooke, P. (1981) 'Low income Housing in Malawi, an evaluation of British aid programme' (mineo) Overseas Development Administration, London.

Doebele (1978) 'Selected issues in urban land tenure' in World Bank (1978) p. 99-207.

Donnison, D.V. (1967) 'The political economy of housing' in Nevitt, A.A. (ed) The economic problem of housing. Macmillan ppl-11.

Doxiadis Consultants (1974) Greater Jos Master Plan. Vol. 4.

Drakakis-Smith, D. (1971a) Housing Standards and Housing Policy in Hong Kong - Implications for Asian Cities (unpublished).

Drakakis-Smith, D. (1971b) 'Housing needs and Planning Policies for the Asian City. The lesson from Hong Kong' The International Journal of Environmental Studies. Vol. 1(2) p.115-128 (1971).

Drakakis-Smith, D. (1978) 'The role of private sector in low cost housing provision' in R.O. Hill and J.U. Bray (ed) Geography and Environment in South-East Asia pp. 297-322. Hong Kong University Press.

Drakakis-Smith, D. and Fisher, W.B. (1975) 'Housing problems in Ankara'. University of Durham, Occasional Paper No. 7 (New Series).

Drakakis-Smith (1981) Urbanisation, Housing and the Development Process. Croom Helm.

Dwyer, D.J. (1970) 'Urban Squatters, the relevance of the Hong Kong experience' Asian Survey, 10(7) 1970 pp. 607-613.

Dwyer, D.J. (1975) People and Housing in the Third World, Longman.

Eames, E. (1967) 'Urban Migration and joint family in a North Indian Village' Journal of Development Areas 1. pp.1967, p. 163-77.

Ebdon, D. (1978) Statistics in Geography: A practical approach. Oxford, Blackwell.

El-Shakhs, S. and Salau, A. (1979) 'Modernisation and the Planning of Cities in Africa. Implications for internal structure'. African Urban Studies, 4 (1979) p.15-25.

Eyre, (1972) 'The shanty-towns of Mtego Bay, Jamaica' Geographical Review, 62, p.394-413.

Federal Government of Nigeria, Building a Greater Nigeria, Third National Development Plan 1975-80.

Federal Government of Nigeria (1978) Land Use Decree. Supplement of Official Gazette. extraordinary No.24. Vol.65.

Folio, C.P. (1974) 'Rationalising the land and housing package' NEDA.
Journal of Development 1974 pp. 438-48.

Fienberg, S.E. (1980) The analysis of cross-classified categorical data
MIT press.

Finlayson, K.A. (1978) 'Squatting and the role of Informal Housing'
in 'Incremental growth and self improvement' H.C.C. Vol. III
No. 4(28) p.42-52.

Flinn, W.L. (1968) 'The process of migration to Shanty-Town in Bagota,
Columbia' Inter-American economic affairs, 21, 1970 pp 398-406.

Franklin, A.H. (1968) 'The place of Housing in the National Plan'
Report of proceedings of the Town and Country Planning Summer
School. (University of Manchester, 1968).

Freedman, L. (1969) Public Housing: The Politics of Poverty. New York,
Holt.

Friedman, J. (1968) 'The strategy of deliberate urbanisation' Journal of
American Institute of Planners, Vol. pp.364-371.

Gart, J.J. and Zweifel, J.R. (1967) 'On the bias of various estimations
of logits and its variance'. Biometrika 54, 1967 pp.181-187.

Giertz, L.M. (1970) 'Population Development as the base for housing need'.
UNECA, DOC. E/CN/14/HOU/79.

Gilbert, A. and Gugler, J. (1983). Cities. Poverty and Development
Urbanisation in Third World. pp.81-115. Oxford University Press.

Gleave, M.B. and White, H.P. (1969) 'The West African Middle Belt
environmental fact or Geographer's fiction?' The Geographical
Review, Vol. LIX, No.1.

Golger, O. (1972) 'Hong Kong: A Problem of Housing the Masses'
Ekistics 32(196) 1972 pp.173-177.

Goodman, L.A. (1970) 'The multivariate analysis of quantitative data.
Interactions among multiple classifications' Journal American
Statistical Association. 65, 1970, pp.226-256.

- Goodman, L.A. (1971) 'The analysis of multidimensional contingency tables. Stepwise procedure and direct estimation methods for building models for multiple classifications' Technometrics, 13, 1971, p.33-61.
- Goodman, L.A. (1972) 'A General Model for the analysis of surveys' American journal of Sociology 77 (1972) pp 7035-85.
- Goodman, L.A. (1973a) 'Causal analysis of data from panel studies and other kinds of surveys'. American journal Soc. 1978 pp. 1135-1191.
- Goodman, L.A. (1973b) 'The analysis of multidimensional contingency tables when some variables are posterior to others: a modified path analysis approach' Biometrika 60, 1973 pp 179-192.
- Gorynski, J. (1971) 'Modern and Traditional Design Techniques in Construction and Housing' Ekistics 31(186) 1971 pp 353-359.
- Gould, W.T. and Prothero, R.M. (1972) 'Space and time dimensions in the study of population mobility in Tropical Africa' Paper presented at I.G.M. symposium on international migration, Edmonton, Canada.
- Green, L.P. (1971) 'Urbanisation and National Development'. NISER 1971. Physical Development Division.
- Gregory, S. (1972) Statistical Methods and the Geographer, Longman.
- Grimes, O.F., (1976) Housing for low-income urban families. Hopkins Press.
- Grizzle, J.E., Starmer, C.F. and Koch, G.G., (1969) 'Analysis of Categorical data by linear models' Biometrics 25, 1969, pp. 489-504.
- Grove, A.T., (1952) Bulletin No. 22 of the Geological survey of Nigeria, Kaduna.
- Gugler, J., (1970) 'Urban growth in sub-Saharan Africa'. (Nkonga Edition No. 6) Kampala. Makere Institute of social research.
- Gugler, J. and Flanagan (1969) Urbanisation and social change in West Africa. Cambridge University Press.

Gutkind, P.W., (1960) 'Congestion and overcrowding: An African urban problem'. Human Organisation. 19, 1960 p.129-34.

Gwom, S.L., (1983) History of Jos and Political Development of Nigeria. Ameh Press Jos.

Haberman, S.J., (1972) 'Log -linear fit for contingency table' Applied Statistics 21, 1972, pp.218-25.

Hance, W.A., (1970) Population migration and urbanisation in West Africa. New York, Columbia University Press. 1970.

Hardoy, J.E. and Satterthwaite, D., (1981) Shelter: Need and Response. John Wiley, 1981.

Harms, H., (1982) 'Historical Perspective on the practices and purpose of self-help housing' in Ward, P. (ed) Self Help Housing, 1982. pp. 17-53, Alexandrine Press..

Harrigan, P. (1979) 'Plateau State Economic Survey' New Africa Development

Harrison, R.S., (1967) 'Migrants in the City of Tripoli' Geographical Reviews 57, 1967, p.397-423.

Harvey, M. and Brand, R., (1974) 'The Spatial Allocation of migrants in Accra, Ghana' Geographical Review 1. 1974, pp. 1-20.

Hasnath, S.A., (1977) 'Consequence of Squatter Removal' Ekistics, Vol. 44, No. 262, 1972, p.198-201.

Heisler, H., (1974) Urbanisation and the government of migration. The inter-relation of urban and rural life in Zambia. London. C. Hurst & Co.

Herrick, B.H., (1965) Urban migration and economic development in Chile. M.I.T. Press.

Hocking, R.R., (1976) 'The Analysis and Selection of Variables in Linear Regrsson' Biometrics 32, 1976, pp. 1-49.

Hodder, B.W., (1959) 'Tin Mining on the Jos-Plateau of Nigeria' Economic Geography Vol. 35, 1959, pp. 109-122.

- Horvath, R.V., (1972) 'A definition of Colonisation' Current Anthropology 13(1) 1972, pp 45-57.
- Houston, J.M. and Beckinsale, R.P., (1970) Urbanisation and its problems. Oxford.
- Jackson, J.C., (1974) 'Urban squatters in South East Asia' Geographical Reviews 59 (1974) p. 24-30.
- Johnson, E.A.J. (1970) The Organisation of Space in Developing Countries Harvard Press (1970).
- Johnston, R.J., Classification in Geography. CATMOG (6).
- Jongkind, F., (1974) 'A reappraisal of the role of the regional association of Lima, Peru. Comparative studies in Society and History Vol.16 1974 pp 471-82.
- Jorgenson, N.O., (1975) 'Housing finance for low income groups with special reference to Developing Countries' Bouwantrum, Rotterdams, Nov. 1975.
- Jos Division Annual Report, 1953.
- Jos Division Annual Report, 1954.
- Jos Metropolitan Development Board Edict No. 5 of 1974 and also in Plateau State Environmental Planning and Development Board Edict No. 1 of 1979 Gazette No. 5.
- Jos Metropolitan Development Board letter No. MIS/1/Vol 11/503 of 30th December 1974.
- Jos Township Report for the Quarter 1921.
- Juppenletzt, M., (1970) Cities in Transformation. University of Queensland Press 1970.
- Kabong Community Development Club, letter No. 333/KCDC/4 of 17th December 1974.
- Karshi, S.S., (1980) 'The impact of Mining on the environment. The case of Tin Mining on the Jos-Plateau'. Paper presented at the 11th annual conference of the 'Nigerian Institute of Town Planners.'

Kessler, E., (1977) 'Institutional support for community-based housing' Ekistics Vol. 44, No. 263 p.203-7, 1977.

King, A.D., (1976) Colonial Urban Development, London, Routeledge and Keagan Paul (1976).

Kliest, T.J. and Scheffer, H.R., (1981) 'John Turner's theory of intra-urban mobility and the African reality. Examples from East and West Africa.' Tijdschrift voon Econ. en Soc. Geografie. 72 (1981) Nr. 5 pp 258-265.

Knoop, H. (1971) The sex-ratio of an African Squatter settlement: An exercise in hypothesis building. African urban notes 6. Nr 1.p.19-29.

Koch, G.G. and Reinfurt, D.W., (1971) 'The Analysis of Categorical data from mixed models' Biometrics 27, 1971, pp. 157-73.

Koch, G.G., Imrey, P.G. and Reinfurt, D.W. (1972) 'Linear model analysis of categorical data with incomplete vectors' Biometrics 28 (1972) 663-92.

Koenigsberger, O. (1970) 'Housing in the National Development Plan; An example from Nigeria' Ekistics Vol.30 No. 180 1970.

Laquian, A.A., (1977) 'Whither site and services' Habitat 2, 1977 pp. 291-301.

Laquian, A.A. (ed) (1971) Rural-urban Migration and Metropolitan Development. Intermet. Toronto.

Lea, J.P. (1983) 'Customary land tenure and urban housing land: Partnership and Participation in Developing Societies' in Angel et al (ed) Land for Housing the Poor, Craftsmans Press, Bankok.

Leads, A., (1969) 'The significant variable determining the character of squatter settlements' America Latina 12, 1969 p. 14-86.

Leeds, A., and Leeds, E., (1970) 'Brazil and the myth of urban rurality, urban experience, work and values' in Field, J.A. (ed) Squatmeats of Rio de Janeiro and Lima. pp. 229-85.

Lehren, R.G. and Koch, G.G., (1974) 'A general linear approach to the analysis of non metric data. Application for political science' American Journal of Political Science, 18, 1974, pp.283-313.

Lindbeck, A. (1967) 'Rent control as an instrument of Housing Policy' in Nevitt (ed) The Economic Problem of Housing, London, Macmillan, 1962.

Little, K. (1959) 'Introduction to special number of urbanisation in West Africa' Sociological Review 7. 1959, pp. 65-82.

Louis, H. and Muench, C.Z., (1968) 'Planning and anti-planning in Nigeria: Lagos and Ibadan.' Journal of American Institute of Planners, Nov. 1968.

Mabogunje, A.L., Hardoy, J.E. and Misra, R.P., (1978) Shelter Provision in Developing Countries. Scope 11, John Wiley & Sons.

Mangin, W., (1967) 'Latin American Squatters Settlements: A problem and a situation' Latin Research Review, University Texas, Vol.II, No. 3, 1976, 65-98.

Mangin, W., (1963) 'Urbanisation case history in Peru' Architectural Design, Vol. 33, 1963 p.366-74.

Martin, R., (1982) 'The foundation of a self-help project in Lusaka' in Ward, P. (ed) Self Help Housing pp. 251-274.

McGee, T.J. (1967) The South East Asian City, London.

Milton, S., (1979) The Shared-Space - The two circuits of the urban economy in underdeveloped countries. Methuen.

Minco Associates, Shankland Cox Consultants - Plateau State Regional Study (1978).

Mitchell, J.C., (1956) 'Urbanisation, detribalisation and stabilisation in Southern Africa. A problem of definition and measurements'. in Forde, D. (ed) Social Implication of Industrialisation and Urbanisation in Africa South of the Sahara. (Tensions/Technology Series) Paris UNESCO.

- Moock, J.C., (1979) The content and maintenance of social ties between urban migrants and their home-based support groups: The Maragoli Case' African Urban Studies 3, 1979 pp. 15-31.
- Morse, R.M., (1971) 'Trends and Issues in Latin American Urban Research - (1965-1970) Part II Latin American Research Review, 6, No. 2. 1971, pp.19-75.
- Moser, C.A. and Kalton, G., (1979) Survey Methods in Social Investigation. Heinemann.
- Mountjoy, A. (1976) Urbanisation, the squatter and Development in the Third World. Tijdschrift voor Econ en Soc. Geografie 67 Nr3. p.130-137.
- Muench, L.H., (1972) 'Town Planning and Social Systems' in Koll, M. (ed) African Urban Development. Frieberg Bertehman Univeritalsverlag.
- Nelder, J.A. (1974) Log-linear models for contingency tables. A generalisation of classical least squares. Applied Statistics No.23, p.323-39.
- Nelder, J.A. and Wedderburn, R.W.M. (1972) Generalised linear models. Journal of Royal Statst. Society Series A. 135 p.370-84.
- Nelson, J. (1970) 'The urban poor, disruption or political integration in Third World Cities?' World Politics 22 1970 p.393-414.
- Nigerian Chamber of Mines Bulletin 1972. Tin in Nigeria p.27.
- Nigeria Year Book 1980. Published Daily Times (Nig) Lagos.
- Northern Nigeria Land Law, Chap. 59.
- Norwood, N.C., (1975) 'Squatter Compounds' African Urban Notes. Series B, No. 2, 1975 pp. 119-132.
- Nurudeen Alao and Olukumle Adegbola (1978) Public policy and the dynamics of urban settlement system in Nigeria. Nigerian Geographical Journal Vol.21 No.2 p.161-178.

O'Connor, A.M., (1972) Communities and States in Tropical Africa.
Wellington, Hicks Smith, London.

O'Connor, A. (1983) The African City. Hutchinson, London.

Onibokun, G.A., (1971) 'Housing finance in Nigeria: A critical survey of private and public resources' Town Planning Review Vol. 42, 1971 p. 277-291.

Onokerhoraye, A., (1977) 'Urban land use in Nigeria: Problems and implications for policy' Town Planning Review Vol. 48, 1977, pp.59-77.

Oram, N., (1978) 'Housing, planning and urban administration' in Murison, H.S. and Lea, J.P. (ed) Housing in Third World Countries pp.43-48, London, Macmillan.

Patel, S.B., (1973) 'A research programme for urban housing' Economic and Political Weekly, 8 No.14, 1973, p.671-676.

Payne, G.K., (1982) 'Self-help housing: A critique of the Gecekondus of Ankara' in Ward, P. (ed) Self Help Housing, pp. 117-139 Alexandrine Press.

Payne, A., (1977) Urban Housing in the Third World. London, Leonard Hill.

Pearse, A., (1970) 'Urbanisation and the incorporation of peasants' in Auther, J.F. (ed) City and Country in the Third World. Issues in the Modernisation of Latin America. pp. 201-12, Cambridge.

Peatite, L.R., (1979) 'Housing policy in developing countries: Two puzzles' World Development 7, 1979, pp. 1017-22.

Peil, M., (1972) The Ghanaian Factory Workers, London: Cambridge University Press.

Peil, M., (1976) 'African Squatter Settlements: A Comparative Study' Urban Studies, 13, 1976, pp. 155-166.

Peil, M., (1981) Cities and suburbs: urban life in West Africa. Africana publishing.

Pfefferman, G. (1968) Industrial labour in the Republic of Senegal.
New York, Preager.

Plackett, R.L., (1974) 'The analysis of categorical data' No. 35 of
— Griffin's Statistical Monographs and Courses (ed) Alan Stuart.

Plateau Provincial Report, 1953.

Plotnicov, L., (1965) 'Going home again - Nigerians, the dream is
unfulfilled' Trans-Action 7, 1965 pp. 18-22.

Plotnicov, L., (1967) Strangers to the City; Urban Man in Jos, Nigeria.

Plotnicov, L., (1970) 'Rural-urban communications in contemporary Nigeria;
The persistence of traditional social institutions.' Journal of
— Asian and African Studies, 5, 1970 p.66-82.

Poethig, R., (1972) 'Life style of the urban poor and people's
organisation' Ekistics 201, 1972, pp.104-107.

Pon, V., (1969) Stanleyville, London, Oxford University Press.

Reeb, D., and Kirk, J., (1973) Housing the Poor, New York, Praeger, 1973.

Reynolds, R.G., (1974) 'The application of the log-linear model to the
analysis of spatial data. Geographical analysis 6, 1974,
pp.179-86.

Rondinelli, D.A., (1983) Secondary cities in Developing Countries.
— Policies for diffusing urbanisation. Sage pub.

Rosser, C., (1971) 'Housing for the lowest income groups; the Calcutta
experience' Ekistics 183, 1971, pp.126-131.

Roy, D.K., (1983) 'The supply of land for Slums of Calcutta' in
Angel et al (ed) Land for Housing the poor p.98-109.

Salau, A.T., (1979) 'Urbanisation, Planning and Public Policies in
Nigeria' in Development of urban systems in Africa (ed) R.A.
Obudho, Shakha, S. Preager.

Santos, M., (1979) The shared-space - The two circuits of the urban
economy in underdeveloped countries. Methuen.

Siegel, S., (1956) Non-parametric statistics for the behavioural sciences.
— McGraw Hill.

Silvey, J., (1975) Deciphering Data. The Analysis of Social Surveys.
Longman.

Simms, R.P., (1965) Urbanisation in West Africa. A review of current literature. Evanston Illinois. Northwestern University Press, 1965.

Skinner, E.D., (1965) 'Labour migration among the Mossi of Upper Volta' in Kaper, H. (ed) Urbanisation and Migration in West Africa. Berkeley, California University Press.

Smith, W., (1972) 'The economics of housing policy' in Dwyer, D.J. (ed) The city as a centre of change in Asia p.152-165. Hong Kong University Press.

Sada, P.O., (1975) 'Urban Housing and the spatial pattern of modernisation in Benin City' The Nigerian Geographical Journal 8, No. 1, 1975, pp. 39-55.

Sada, P.O. (1972) Residential land use in Lagos. The relevance of traditional models. African urban notes 7, No.1. p.3-26.

Sofier, U.N., (1973) Urban land policies and land control measures Vol. I 1973, Africa, New York.

Strassman, W.P., (1970) 'Construction, productivity and employment in Developing Countries' International Labour Review 101(5) 1970 p. 503-518.

Stren, R., (1972) 'A survey of lower income areas in Mombasa' in Hutton, J. (ed) Urban challenge in East Africa, Nairobi. East African publishing house.

Tipple, A.G., (1976) 'Self-help housing policies in a Zambian Mining Town' Urban Studies 13, 1976 pp. 167-169.

Tiwari, R.C. (1972) Some aspects of social goegrpahy of Nairobi, Kenya. African urban notes, 7 No.1. 36-61.

Turner, J., (1965) 'Lima's Barriadas and Corralones: Suburbs versus Slums' Ekistics 112, 1965.

Turner, J., (1967a) 'Barriers and Channels for housing development in modernising countries' in Journal of the American Institute of Planners, 23, 1967, 167-81.

Turner, J., (1967b) 'The Squatter Settlements: Arthitecture that Works' Architectural Design, 38, 1967 p. 355-360.

- Turner, J., (1968) 'Housing priorities, settlement patterns and urban development in modernising countries' Journal of the American Institute of Planners. 34, 1968 p 354-63.
- Turner, J., (1972) 'Housing issues and the standard problem' Ekistics vol.33, 1972 pp 152-8.
- Turner, J., (1976) Housing by People - Towards autonomy in building environment. Marion Bayans.
- Turner, J., (1982) 'Issues in self help and self-managed housing' in Ward, P. (ed) Self Help Housing pp. 99-113. Alexandrine Press.
- United Nations Economic Commission for Africa, Human settlement in Africa (E/CN.14/HUS/15) Addis Ababa, 1976, p.105.
- United Nations (1971a) Popular Participation in Development. Emerging Trends in Community Development. New York. I.N.
- United Nations (1971b) Improvement of slums or uncontrolled settlements Geneva, U.N.
- Upton, G.J.G., (1978) The Analysis of cross-tabulated data. John Wiley.
- Upton, G.J.A., (1981) 'Log-linear models screening and regional industrial surveys' Regional Studies Vol.15, No. 1, 1981, pp.33-45.
- Urquhart, A.W., (1977) Planned Urban Landscape of Northern Nigeria. Ahmadu Bello University Press.
- Wallis, A.C., (1959) 'Factors leading to migration to towns and town growth in Africa' in C.C.T.A. inter-African conference on Housing and Urbanisation Vol.93 No. 96, 1959. London.
- Ward, P. (1976) The Home of Man. Penguin.
- Ward, P., (1976) 'The squatter settlements as slum or housing solution' Evidence from Mexico'. Land Economics Vol.52(3) 1976, p.330-46.
- Ward, P. (1982) 'The practice and potentials of self help housing in Mexico city' in Ward, P. (ed) Self Help Housing pp. 175-208. Alexandria Press.
- Ward, P. (1983) 'Land for housing the poor. How can planners contribute?' in Angel et al (ed) Land for Housing the Poor pp. 34-53. Craftsman Press.

Wegelin, E.A. (1977) Urban low-income housing and development, Martiuns Nojhoff.

Wegelin, E.A. and Chanond, C., (1983) 'Home Improvement, Housing Finance and Security of Tenure in Bangkok Slums' in Angel et al (ed) Land for Housing the Poor pp. 75-97.

Weisberg, H.F., (1974) 'Models of Statistical relationship' American Political Science Review 68, 1974, pp. 1638-55.

Weisberg, H.F. and Bowen, B.D., (1977) Introduction to Survey Research and Data Analysis. Freeman & Co.

Williams, W.T. and Lambert, J.M. (1959) Multivariate methods in plant ecology 1. Association Analysis in plant communities. Journal of Ecology, 47, 83-101.

World Bank (1974) Site and Services Projects, Washington, World Bank.

World Bank (1975) Housing Sector Policy Paper, Washington, World Bank.

World Bank (1979) National Urbanisation Policies in Developing Countries Washington, World Bank.

Wrigley, N. (1979) 'Developments in the statistical analysis of categorical data' Progress in Human Geography Vol. 3, No. 3, 1979, pp. 315-355.

Yesuf, T.M. et al (1974) 'Characteristics of the unemployed in Lagos' Research Bulletin No. 2/003 Human Resource Unit, University of Lagos.

Zachariah, K.C., (1966) 'Bombay Migration Study: A pilot analysis of migration to an Asian metropolis' Demography 3. 1966, p.378-92.

Zelinsky, W. (1970) 'The hypothesis of the mobility transition' Geographical Review 61, 1970. p.219-49.

APPENDICES

APPENDIX I: THE SURVEY QUESTIONNAIRE

APPENDIX I
HOUSEHOLD SURVEY:

WARD/AREA
HOUSE NUMBER
DATE OF INTERVIEW

A. HOUSEHOLD CHARACTERISTICS

- 1. NAME
- 2. ADDRESS
- 3. SEX: (a) MALE
 (b) FEMALE
- 4. AGE
- 5. RELIGION: (a) CHRISTIAN
 (b) MUSLEM
 (c) OTHERS
- 6. PLACE OF BIRTH
- 7. STATE OF ORIGIN
- 8. ETHNIC GROUP (TRIBE)
- 9. MARITAL STATUS: (a) MARRIED
 (b) SINGLE
 (c) DIVORCE
 (d) WIDOW
- 10. HOW MANY WIVES HAVE YOU?
 (a) ONE
 (b) TWO
 (c) THREE
 (d) FOUR
 (e) MORE THAN FOUR
- 11, HOW MANY CHILDREN HAVE YOU?
 (a) STATE NUMBER OF CHILDREN BORN IN JOS
 (b) STATE NUMBER OF CHILDREN BORN ELSEWHERE

II

12. HOW MANY PERSONS ARE THERE IN YOUR HOUSEHOLD?
- (a) HOW MANY PERSONS ARE PRESENT? (i) WIFE
(ii) CHILDREN
- (b) HOW MANY PERSONS ARE ABSENT? (i) WIFE
(ii) CHILDREN
13. REASONS FOR THEIR ABSENCE:
- (a) AWAY FARMING IN HOMETOWN
- (b) VISITING RELATIVES IN HOMETOWN
- (c) LIVING OR SLEEPING SOMEWHERE IN JOS
- (d) ATTENDING SCHOOL OR COLLEGE

B. HOUSEHOLD RESIDENTIAL HISTORY

14. HOW MANY YEARS HAVE YOU LIVED IN JOS?
15. REASONS FOR COMING TO JOS
- (a) ALWAYS IN JOS
- (b) EMPLOYMENT SECURED BEFORE ARRIVAL
- (c) IN SEARCH OF EMPLOYMENT
- (d) EDUCATION
- (e) FAMILY REASONS
- (f) OTHER REASONS (STATE)
16. FIRST AREA (AWARD) OF RESIDENCE IN JOS
17. WAS IT, (a) RENTED ACCOMMODATION
- (b) RELATIVES
- (c) FRIENDS
- (d) OTHERS (STATE)
18. REASONS FOR MOVING TO PRESENT AREA OF RESIDENCE
- (a) OWN HOUSE
- (b) RELATIVES
- (c) FRIENDS
- (d) CHEAP RENT

III

- (e) BETTER FACILITIES
- (f) OTHERS (STATE)
- 19. LAST TOWN (PLACE) OF RESIDENCE PRIOR TO JOS
- 20. IS YOUR PRESENT HOUSEHOLD DWELLING
 - (a) SELF CONTAINED
 - (b) SHARED
- 21. WHAT TYPE OF RENT DO YOU PAY?
 - (a) OWN HOUSE
 - (b) FREE
 - (c) SUBSIDISED
 - (d) FULL RENT
- 22. STATE RELATIONSHIP WITH LANDLORD
 - (a) RELATIVE
 - (b) FROM THE SAME VILLAGE
 - (c) FRIEND
 - (d) NONE
- 23. HOW MUCH RENT DO YOU PAY IN NAIRA?
- 24. DO YOU INTEND TO STAY IN JOS PERMANENTLY
 - (a) YES
 - (b) NO
 - (c) DON'T KNOW
- 25. HAVE YOU ACQUIRED A PLOT IN JOS?
 - (a) YES
 - (b) NO
- 26. IF NO, DO YOU HOPE TO ACQUIRE ONE
 - (a) YES
 - (b) NO
- 27. IF YES, IN WHICH AREA (PART) OF JOS IS THE PLOT
LOCATED
- 28. IS THE PLOT (a) DEVELOPED
 - (b) BEING DEVELOPED
 - (c) UNDEVELOPED

IV

29. IF DEVELOPED, STATE TYPE OF OCCUPATION

- (a) OWNER OCCUPATION
- (b) RENTED-OUT
- (c) BOTH (a) AND (b) ABOVE

30. IF BEING DEVELOPED, WILL YOU:

- (a) OCCUPY IT YOURSELF
- (b) RENT IT OUT
- (c) BOTH (a) AND (b) MENTIONED ABOVE
- (d) DON'T KNOW

31. STATE SOURCES OF FINANCE

- (a) OWN MONEY
- (b) FAMILY INCOME
- (c) LOAN
- (d) CAN'T FINANCE

C. EDUCATIONAL BACKGROUND

32. LEVEL OF EDUCATION

- (a) JUNIOR PRIMARY EDUCATION
- (b) SENIOR PRIMARY EDUCATION
- (c) SECONDARY/TEACHER TRAINING
- (d) POST SECONDARY
- (e) VOCATIONAL
- (f) ADULT EDUCATION
- (g) OTHERS (STATE)

D. OCCUPATION

33. ARE YOU PRESENTLY EMPLOYED?

- (a) YES
- (b) NO

V

34. WHAT IS YOUR OCCUPATION?
35. NAME OF EMPLOYER
- (a) GOVERNMENT
 - (b) PRIVATE SECTOR
 - (c) SELF-EMPLOYED
36. TYPE OF APPOINTMENT
- (a) PERMANENT AND PENSIONABLE
 - (b) DAILY PAY
 - (c) CONTRACT
37. ARE YOU ENGAGED IN ANY SECONDARY OCCUPATION
- (a) YES
 - (b) NO
38. IF YES, STATE TYPE OF OCCUPATION

E. NATURE AND FREQUENCY OF LINKS WITH HOMETOWN

39. WHERE IS YOUR HOMETOWN?
40. HOW OFTEN DO YOU RECEIVE VISITORS FROM YOUR HOMETOWN?
- (a) ONCE A YEAR
 - (b) TWICE A YEAR
 - (c) THREE TIMES A YEAR
 - (d) MORE THAN THREE TIMES A YEAR
41. HOW OFTEN DO YOU VISIT YOUR HOMETOWN?
- (a) ONCE A YEAR
 - (b) TWICE A YEAR
 - (c) THREE TIMES A YEAR
 - (d) MORE THAN THREE TIMES A YEAR
42. REASONS FOR VISITING YOUR HOMETOWN
- (a) VISITING RELATIVES
 - (b) VISITING OWN FAMILY (WIFE/CHILDREN)
 - (c) FARMING

VI

(d) BUILDING A HOUSE

(e) OTHER REASONS (SPECIFY)

43. DO YOU HOPE TO GO BACK TO YOUR HOMETOWN ON RETIREMENT?

(a) YES

(b) NO

(c) DON'T KNOW

44. DO YOU OWN A PLOT IN YOUR HOMETOWN?

(a) YES

(b) NO

45. IF YES, IS THE PLOT (a) DEVELOPED

(b) BEING DEVELOPED

(c) UNDEVELOPED

46. IF NOT, DO YOU HOPE TO ACQUIRE ONE (a) YES

(b) NO

47. STATE SOURCES OF FINANCE

(a) OWN MONEY

(b) FAMILY MONEY

(c) LOAN

(d) CAN'T FINANCE

APPENDIX II

UNIFIED SALARY STRUCTURE FOR THE PUBLIC SECTOR

APPENDIX II

	GRADE LEVEL	STEP							INCREMENTAL RATES
		1	2	3	4	5	6	7	
NO EDUCATION TO PRIMARY EDUCATION	01	N 720	N 744	N 768	N 792	N 816	N 840	N 870	+24/30
	02	804	834	864	894	924	954	984	+30
	03	900	936	972	1,014	1,056	1,098	1,140	+36/42
SECONDARY EDUCATION	04	1,164	1,206	1,248	1,290	1,342	1,374	1,416	+42
	05	1,440	1,512	1,584	1,656	1,728	1,800	1,872	+72
POST SECONDARY EDUCATION	06	1,908	2,004	2,100	2,196	2,292	2,388	2,484	+96
	07	2,496	2,616	2,736	2,856	2,976	3,096	3,216	+120
	08	3,264	3,414	3,564	3,714	3,864	4,014	4,164	+150
	09	4,368	4,530	4,692	4,854	5,016	5,178	5,340	+162
	10	5,460	5,622	5,784	5,946	6,108	6,270	6,432	+162
	11	6,444	6,624	6,804	6,984	-	-	-	+180
	12	7,104	7,320	7,536	7,752	-	-	-	+216
	13	7,764	8,084	8,404	8,724	-	-	-	+320
	14	8,868	9,188	9,508	9,828	-	-	-	+320
	15	9,996	10,512	11,028	-	-	-	-	+516
	16	11,268	11,844	12,420	-	-	-	-	+576
	17	12,696	13,332	13,968	-	-	-	-	+636

UNIFIED SALARY STRUCTURE FOR THE PUBLIC SECTOR

IM is approximately £0.82

SOURCE: Public Service Review Commission, Main Report (197) Udojc Commission

APPENDIX III

TABLE OF CRITICAL VALUES OF CHI-SQUARE

APPENDIX IIITABLE OF CRITICAL VALUES OF CHI SQUARE*

PROBABILITY UNDER H_0 THAT χ^2 chi square					
df	.10	.05	.02	.01	.001
1	2.71	3.84	5.41	6.64	10.83
2	4.60	5.99	7.82	9.21	13.82
3	6.25	7.82	9.84	11.34	16.27
4	7.78	9.49	11.67	13.28	18.46
5	9.24	11.07	13.39	15.09	20.52
6	10.64	12.59	15.03	16.81	22.46
7	12.02	14.07	16.62	18.48	24.32
8	13.36	15.51	18.17	20.09	26.12
9	14.68	16.92	19.08	21.67	27.88
10	15.99	18.31	21.16	23.21	29.59
11	17.28	19.68	22.62	24.72	31.26
12	18.55	21.03	24.05	26.22	32.91
13	19.81	22.36	25.47	27.69	34.53
14	21.06	23.68	26.87	29.14	36.12
15	22.31	25.00	28.26	30.58	37.70
16	23.54	26.30	29.63	32.00	39.29
17	24.77	27.59	31.00	33.41	40.75
18	25.99	28.87	32.35	34.80	42.31
19	27.20	30.14	33.69	36.19	43.82
20	28.41	31.41	35.02	37.57	45.32
21	29.62	32.67	36.34	38.93	46.80
22	30.81	33.92	37.66	40.29	48.27
23	32.01	35.17	38.97	41.64	49.73
24	33.20	36.42	40.27	42.98	51.18
25	34.38	37.65	41.57	44.31	52.62
26	35.56	38.88	42.86	45.64	54.05
27	36.74	40.11	44.14	46.96	55.48
28	37.92	41.34	45.42	48.28	56.89
29	39.09	42.56	46.69	49.59	58.30
30	40.26	43.77	47.96	50.89	59.70

Source: Siegel, S. (1956) Non-parametric Statistics for Behavioural Sciences. McGraw Hill.

APPENDIX IV

RESULTS OF THE LOG-LINEAR MODELLING, PLOT
OWNERSHIP IN JOS, (PL) PROPENSITY TO STAY
PERMANENTLY IN THE CITY (L) AND RESPONDENT'S
AREA OF RESIDENCE IN THE CITY (A)

APPENDIX IV

TABLE 1

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE CITY (PL) AREA OF RESIDENCE IN THE CITY (A) AND INTENDED
LENGTH OF STAY IN THE CITY (L)

FIT +PL+A+L
DIS M E R
*SCALED
CYCLE DEVIANCE
4 120.7

DF
22

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR
%GM PL A L

	ESTIMATE	S.E.	PARAMETER
1	3.317	0.1220	%GM
2	-0.7781	0.1085	PL(2)
3	-0.5077E-01	0.1425	A(2)
4	-0.3015E-01	0.1418	A(3)
5	-0.7233	0.1741	A(4)
6	-0.7031	0.1729	A(5)
7	-0.8643E-01	0.1154	L(2)
8	-0.5236	0.1308	L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	27.58	2.746
2	17	25.30	-1.649
3	6	16.34	-2.557
4	29	26.21	0.5440
5	45	24.04	4.274
6	7	15.53	-2.164
7	18	26.76	-1.694
8	30	24.54	1.101
9	8	15.85	-1.972
10	13	13.38	-0.1040
11	16	12.27	1.064
12	4	7.926	-1.394
13	18	13.65	1.176
14	13	12.52	0.1348
15	4	8.088	-1.437
16	12	12.67	-0.1872
17	4	11.62	-2.235
18	20	7.503	4.562
19	4	12.04	-2.317
20	4	11.04	-2.119
21	7	7.132	-0.4926E.01
22	10	12.29	-0.6532
23	9	11.27	-0.6768
24	23	7.280	5.826
25	5	6.145	-0.4619
26	4	5.636	-0.6892
27	7	3.640	1.761
28	6	6.270	-0.1080
29	2	5.751	-1.564
30	7	3.714	1.705

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MULTIPLE INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE CITY (PL) AND AREA OF RESIDENCE IN THE CITY (A)

FIT *PL.A

DIS M E R

* SCALED

CYCLE DEVIANCE

DF

4 101.5

18

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL A L PL.A

	ESTIMATE	S.E.	PARAMETER
1	3.254	0.1386	%GM
2	-0.5909	0.2077	PL(2)
3	0.2201	0.1665	A(2)
4	-0.1490	0.1823	A(3)
5	-0.6779	0.2137	A(4)
6	-0.6190	0.2096	A(5)
7	-0.8643E-01	0.1154	L(2)
8	-0.5236	0.1308	L(3)
9	-1.096	0.3495	PL(2).A(2)
10	0.3032	0.2912	PL(2).A(3)
11	-0.1331	0.3687	PL(2).A(4)
12	-0.2564	0.3720	PL(2).A(5)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	25.90	3.163
2	17	23.76	-1.386
3	6	15.34	-2.385
4	29	32.28	-0.5767
5	45	29.60	2.830
6	7	19.12	-2.772
7	18	22.31	-0.9134
8	30	20.47	2.107
9	8	13.22	-1.435
10	13	13.15	-0.4129E.01
11	16	12.06	1.134
12	4	12.06	1.134
13	18	13.95	1.085
14	13	12.79	0.5819E.01
15	4	8.261	-1.483
16	12	14.35	-0.6192
17	4	13.16	-2.525
18	20	8.497	3.946
19	4	5.977	-0.8087
20	4	5.482	-0.6330
21	7	3.541	1.838
22	10	16.74	-1.647
23	9	15.35	-1.621
24	23	9.914	4.156
25	5	6.376	-0.5448
26	4	5.848	-0.7641
27	7	3.777	1.659
28	6	5.977	0.9343E.02
29	2	5.482	-1.487
30	7	3.541	1.838

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MULTIPLE INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE CITY (PL) AND INTENDED LENGTH OF STAY IN THE CITY(L)

FIT -PL.A+PL.L

DIS M E R

* SCALED

CYCLE DEVIANCE

3 43.27

DF

20

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL A L PL.L

	ESTIMATE	S.E.	PARAMETER
1	3.426	0.1252	%GM
2	-1.177	0.1879	PL(2)
3	-0.5077E.01	0.1423	A(2)
4	-0.3015E.01	0.1417	A(3)
5	-0.7233	0.1740	A(4)
6	-0.7031	0.1728	A(5)
7	0.8300E.02	0.1287	L(2)
8	-1.420	0.2069	L(3)
9	-0.4837	0.2948	PL(2).L(2)
10	1.968	0.2921	PL(2).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	30.76	2.026
2	17	31.02	-2.517
3	6	7.434	-0.5259
4	29	29.24	-0.4415E.01
5	45	29.48	2.858
6	7	7.066	-0.2484E.01
7	18	29.85	-2.169
8	30	30.10	-0.1759E.01
9	8	7.213	0.2930
10	13	14.92	-0.4980
11	16	15.05	0.2454
12	4	3.607	0.2072
13	18	15.23	0.7102
14	13	15.36	-0.6011
15	4	3.680	0.1667
16	12	9.485	0.8167
17	4	5.896	-0.7808
18	20	16.41	0.8873
19	4	9.015	-1.670
20	4	5.604	-0.6776
21	7	15.59	12.176
22	10	9.203	0.2627
23	9	5.721	1.371
24	23	15.92	1.775
25	5	4.602	0.1858
26	4	2.860	0.6738
27	7	7.959	-0.3401
28	6	4.695	0.6020
29	2	2.919	-0.5378
30	7	8.122	-0.3936

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MULTIPLE INDEPENDENCE BETWEEN AREA OF
RESIDENCE IN THE CITY (A) AND INTENDED LENGTH OF STAY IN THE CITY (L)

FIT -PL.L+A.L
DIS M E R
*SCALED
CYCLE DEVIANCE DF
4 90.61 14

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR
%GM PL A L A.L

	ESTIMATE	S.E.	PARAMETER
1	3.611	0.1403	%GM
2	-0.7781	0.1085	PL(2)
3	-0.4925	0.2210	A(2)
4	-0.6586	0.2329	A(3)
5	-1.099	0.2722	A(4)
6	-0.8109	0.2453	A(5)
7	-0.9445	0.2572	L(2)
8	-0.7309	0.2385	L(3)
9	1.340	0.3418	A(2).L(2)
10	-0.1266	0.3983	A(2).L(3)
11	1.276	0.3571	A(3).L(2)
12	0.8327	0.3533	A(3).L(3)
13	1.050	0.4144	A(4).L(2)
14	0.2384	0.4509	A(4).L(3)
15	0.4745	0.4177	A(5).L(2)
16	-0.4927E.01	0.4353	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	37.01	0.8211
2	17	14.39	0.6878
3	6	17.82	-2.800
4	29	22.61	1.343
5	45	33.58	1.971
6	7	9.594	-0.8374
7	18	19.19	-0.2712
8	30	26.73	0.6333
9	8	21.24	-2.873
10	13	12.34	0.1893
11	16	13.71	0.6198
12	4	7.538	-1.289
13	18	16.45	0.3830
14	13	10.28	0.8486
15	4	7.538	-1.289
16	12	16.99	-1.212
17	4	6.609	-1.015
18	20	8.183	4.131
19	4	10.39	-1.982
20	4	15.42	-2.908
21	7	4.406	1.236
22	10	8.812	0.4001
23	9	12.27	-0.9345
24	23	9.756	4.240
25	5	5.665	-0.2794

26	4	6.294	-0.9145
27	7	3.462	1.902
28	6	7.553	-0.5652
29	2	4.721	-1.252
30	7	3.462	1.902

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF CONDITIONAL INDEPENDENCE BETWEEN PL.L+A.L

FIT +PL.L

DIS M E R

*SCALED

CYCLE DEVIANCE

DF

3 13.19

12

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL A L PL.L A.L

	ESTIMATE	S.E.	PARAMETER
1	3.720	0.1431	%GM
2	-1.177	0.1879	PL(2)
3	-0.4925	0.2209	A(2)
4	-0.6568	0.2328	A(3)
5	-1.099	0.2721	A(4)
6	-0.8109	0.2453	A(5)
7	-0.8497	0.2634	L(2)
8	-1.627	0.2875	L(3)
9	-0.4837	0.2948	PL(2).L(2)
10	1.968	0.2922	PL(2).L(3)
11	1.340	0.3417	A(2).L(2)
12	-0.1266	0.3981	A(2).L(3)
13	1.276	0.3570	A(3).L(2)
14	0.8327	0.3534	A(3).L(3)
15	1.050	0.4143	A(4).L(2)
16	0.2384	0.4510	A(4).L(3)
17	0.4745	0.4176	A(5).L(2)
18	-0.4927E.01	0.4353	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	41.27	0.1130
2	17	17.65	-0.1537
3	6	8.108	-0.7402
4	29	25.22	0.7521
5	45	41.17	0.5963
6	7	4.366	1.261
7	18	21.40	-0.7352
8	30	32.77	-0.4840
9	8	9.667	-0.5361
10	13	13.76	-0.2043
11	16	16.81	-0.1965
12	4	3.430	0.3077
13	18	18.34	-0.8031E.01
14	13	12.60	0.1115
15	4	3.430	0.3077
16	12	12.73	-0.2035
17	4	3.354	0.3526
18	20	17.89	0.4982
19	4	7.777	-1.354
20	4	7.826	-1.368
21	7	9.634	-0.8487
22	10	6.599	1.324
23	9	6.229	1.110
24	23	21.33	0.3608

25	5	4.242	0.3680
26	4	3.194	0.4507
27	7	7.570	-0.2071
28	6	5.656	0.1446
29	2	2.396	-0.2557
30	7	7.570	-0.2071

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF CONDITIONAL INDEPENDENCE BETWEEN PL.A+A.L.

FIT -PL.L+PL.A

DIS M E R

*SCALED

CYCLE DEVIANCE

4 71.45

DF

10

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL A L PL.A A.L

	ESTIMATE	S.E.	PARAMETER
1	3.548	0.1549	%GM
2	-0.5909	0.2077	PL(2)
3	-0.2216	0.2371	A(2)
4	-0.7757	0.2596	A(3)
5	-1.053	0.2991	A(4)
6	-0.77269	0.2725	A(5)
7	-0.9445	0.2572	L(2)
8	-0.7309	0.2386	L(3)
9	-1.096	0.3495	PL(2).A(2)
10	0.3032	0.2912	PL(2).A(3)
11	-0.1331	0.3687	PL(2).A(4)
12	-0.2564	0.3720	PL(2).A(5)
13	1.340	0.3418	A(2).L(2)
14	-0.1266	0.3983	A(2).L(3)
15	1.276	0.3571	A(3).L(2)
16	0.8327	0.3534	A(3).L(3)
17	1.050	0.4144	A(4).L(2)
18	0.2384	0.4510	A(4).L(3)
19	0.4745	0.4177	A(5).L(2)
20	-0.4927E.01	0.4353	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

*PROPORTION OF UNEXPLAINED VARIATION

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	34.75	1.229
2	17	13.51	0.9480
3	6	16.73	-2.624
4	29	27.84	0.2191
5	45	41.34	0.5686
6	7	11.81	-1.400
7	18	16.00	0.5000
8	30	22.29	1.634
9	8	17.71	-2.308
10	13	12.12	0.2520
11	16	13.47	0.6895
12	4	7.408	-1.252
13	18	16.80	0.2928
14	13	10.50	0.7715
15	4	7.700	-1.333
16	12	19.25	-1.652
17	4	7.485	-1.274
18	20	9.267	3.526
19	4	5.156	-0.5092
20	4	7.656	-1.321
21	7	2.188	3.254
22	10	12.00	-0.5774
23	9	16.71	-1.887
24	23	13.29	2.665
25	5	5.878	-0.3620
26	4	6.531	-0.9903
27	7	3.592	1.798
28	6	7.200	-0.4472
29	2	4.500	-1.179
30	7	3.300	2.037

COMPUTER OUTPUT: TEST OF CONDITIONAL INDEPENDENCE BETWEEN PL.A+PL.L

FIT -A.L+PL.L

DIS M E R

*SCALED

CYCLE DEVIANCE

3 24.11

DF

16

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL A L PL.A PL.L

	ESTIMATE	S.E.	PARAMETER
1	3.363	0.1413	%GM
2	-0.9893	0.2582	PL(2)
3	0.2201	0.1664	A(2)
4	-0.1490	0.1821	A(3)
5	-0.6779	0.2136	A(4)
6	-0.6190	0.2095	A(5)
7	0.8299E.02	0.1288	L(2)
8	-1.420	0.2068	L(3)
9	-1.096	0.3494	PL(2).A(2)
10	0.3032	0.2911	PL(2).A(3)
11	-0.1330	0.3686	PL(2).A(4)
12	-0.2564	0.3719	PL(2).A(5)
13	-0.4837	0.2950	PL(2).L(2)
14	1.968	0.2923	PL(2).L(3)
	SCALE PARAMETER TAKEN AS		1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	28.69	2.439
2	17	29.13	-2.247
3	6	6.982	-0.3715
4	29	36.00	-1.167
5	45	36.30	1.444
6	7	8.700	-0.5764
7	18	24.89	-1.381
8	30	25.10	0.9789
9	8	6.015	0.8095
10	13	14.67	-0.4352
11	16	14.79	0.3149
12	4	3.544	0.2420
13	18	15.56	0.6198
14	13	15.69	-0.6780
15	4	3.759	0.1242
16	12	10.74	0.3838
17	4	6.677	-1.036
18	20	18.58	0.3293
19	4	4.476	-0.2249
20	4	2.782	0.7301
21	7	7.742	-0.2666
22	10	12.53	-0.7153
23	9	7.790	0.4334
24	23	21.68	0.2841
25	5	4.774	0.1033
26	4	2.968	0.5992
27	7	8.258	-0.4378
28	6	4.476	0.7205
29	2	2.782	-0.4690
30	7	7.742	-0.2667

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF PAIRWISE ASSOCIATION BETWEEN: PL.A+PL.L+A.L

FIT +A.L

DIS M E R

*SCALED

CYCLE DEVIANCE

DF

3 1.687

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL A L PL.A PL.L A.L

	ESTIMATE	S.E.	PARAMETER
1	3.692	0.1514	%GM
2	-1.061	0.2581	PL(2)
3	-0.3268	0.2320	A(2)
4	-0.7508	0.2532	A(3)
5	-1.098	0.2921	A(4)
6	-0.7665	0.2636	A(5)
7	-0.8478	0.2652	L(2)
8	-1.651	0.3073	L(3)
9	-0.9008	0.3865	PL(2).A(2)
10	0.3245	0.3329	PL(2).A(3)
11	-0.4883E.03	0.4130	PL(2).A(4)
12	-0.1851	0.4121	PL(2).A(5)
13	-0.4439	0.3065	PL(2).L(2)
14	1.927	0.2989	PL(2).L(3)
15	1.288	0.3439	A(2).L(2)
16	0.2490	0.4320	A(2).L(3)
17	1.302	0.3588	A(3).L(2)
18	0.6878	0.3831	A(3).L(3)
19	1.050	0.4155	A(4).L(2)
20	0.2386	0.4873	A(4).L(3)
21	0.4612	0.4188	A(5).L(2)
22	0.3297E.01	0.4722	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

*PROPORTION OF UNEXPLAINED VARIATION

	UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
	1	42	40.12	0.2972
	2	17	17.18	-0.4461E.01
	3	6	7.697	-0.6118
	4	29	28.93	0.1253E.01
	5	45	44.95	0.8011E.02
	6	7	7.121	-0.4539E.01
	7	18	18.94	-0.2150
	8	30	29.84	0.2985E.01
	9	8	7.227	0.2874
	10	13	13.37	-0.1023
	11	16	16.37	-0.9097E.01
	12	4	3.258	0.4113
	13	18	18.64	-0.1482
	14	13	12.66	0.9449E.01
	15	4	3.696	0.1579
	16	12	13.88	-0.5052
	17	4	3.815	0.9468E.01
	18	20	18.30	0.3968
	19	4	4.067	-0.3343E.01
	20	4	4.054	-0.2667E.01
	21	7	6.879	0.4618E.01
	22	10	9.064	0.3108
	23	9	9.163	-0.5386E.01
	24	23	23.77	-0.1585
	25	5	4.626	0.1740
	26	4	3.632	0.1931
	27	7	7.742	-0.2668
	28	6	5.360	0.2764
	29	2	2.336	-0.2200
	30	7	7.304	-0.1124

APPENDIX V

RESULTS OF THE LOG-LINEAR MODELLING, PLOT
OWNERSHIP IN THE RURAL HOMETOWN, (PLH),
INTENDED RETIREMENT IN THE HOMETOWN (RT) AND
AREA OF RESIDENCE IN THE CITY (A)

TABLE 1

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN HOMETOWN (PLH), INTENDED RETIREMENT IN THE HOMETOWN (RT) AND AREA
OF RESIDENCE IN THE CITY (A)

FIT +PLH+A+RT

DIS M E R

	*SCALED	DEGREES OF FREEDOM
CYCLE	DEVIANCE	(DF)
5	122.8	22

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PLH A RT

	ESTIMATE	S.E.	PARAMETER
1	1.749	0.1641	%GM
2	0.9016	0.1131	PL(2)
3	-0.4256E.01	0.1459	A(2)
4	-0.1403E.10	0.1443	A(3)
5	-0.7142	0.1780	A(4)
6	-0.6523	0.1744	A(5)
7	-0.2751	0.1712	L(2)
8	1.119	0.1296	L(3)
	SCALE PARAMETER TAKEN AS		1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	5.747	1.357
2	12	4.365	3.655
3	9	17.60	-2.051
4	10	5.508	1.914
5	2	4.183	-1.067
6	5	16.87	-2.890
7	7	5.747	0.5227
8	14	4.365	4.612
9	16	17.60	-0.3825
10	1	2.814	-1.081
11	1	2.137	-0.7778
12	4	8.619	-1.573
13	3	2.993	0.3914E.02
14	7	2.273	3.135
15	10	9.169	0.2744
16	21	14.16	1.818
17	1	10.75	-2.974
18	44	43.37	0.9541E.01
19	9	13.57	-1.240
20	0	10.31	-3.210
21	66	41.56	3.790
22	9	14.16	-1.371
23	15	10.75	1.295
24	35	43.37	-1.271
25	4	6.932	-1.114
26	5	5.265	-0.1153
27	32	21.23	2.336
28	6	7.374	-0.5061
29	3	5.601	-1.099
30	21	22.59	-0.3344

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MULTIPLE INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN HOMETOWN (PLH) AND AREA OF RESIDENCE IN THE CITY (A).

FIT +PLH.A
DIS M E R
*SCALED DEGREES OF FREEDOM
CYCLE DEVIANCE (DF)
5 103.3 18

Y-VARIATE FR
ERROR POSSION LINK LOG

LINEAR PREDICTOR
%GM

PLH A RT PLH.A

	ESTIMATE	SE	PARAMETER
1	1.828	0.2082	%GM
2	0.7885	0.2202	PL(2)
3	-0.5680	0.3036	A(2)
4	0.2097	0.2457	A(3)
5	-1.609	0.4472	A(4)
6	-0.4055	0.2887	A(5)
7	-0.2751	0.1712	L(2)
8	1.119	0.1296	L(3)
9	0.6958	0.3473	PL(2).A(2)
10	-0.3218	0.3041	PL(2).A(3)
11	1.133	0.4894	PL(2).A(4)
12	-0.3830	0.3631	PL(2).A(5)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	6.220	1.114
2	12	4.724	3.347
3	9	19.06	-2.303
4	10	3.525	3.449
5	2	2.677	-0.4139
6	5	10.80	-1.764
7	7	7.672	-0.2426
8	14	5.827	3.386
9	16	23.50	-1.547
10	1	1.244	-0.2188
11	1	0.9449	0.5670E-01
12	4	3.811	0.9680E-01
13	3	4.147	-0.5632
14	7	3.150	2.170
15	10	12.70	-0.7585
16	21	13.69	1.977
17	1	10.39	-2.914
18	44	41.92	0.3211
19	9	15.55	-1.661
20	0	11.81	-3.437
21	66	47.64	2.660
22	9	12.23	-0.9245
23	15	9.291	1.873
24	35	37.48	-0.4043
25	4	8.501	-1.544
26	5	6.457	-0.5733
27	32	26.04	1.168
28	6	6.220	-0.8840E-01
29	3	4.724	-0.7934
30	21	19.06	0.4455

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MULTIPLE INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE HOMETOWN (PLH) AND INTENDED RETIREMENT IN HOMETOWN (RT)

FIT -PLH.A + PLH.RT

DIS M E R

* SCALED DEGREES OF FREEDOM
CYCLE DEVIANCE (DF)
4 79.96 20

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PLH A RT + PLH.RT

	ESTIMATE	S.E.	PARAMETER
1	2.023	0.2028	%GM
2	0.4906	0.2318	PL(2)
3	-0.4256E-01	0.1459	A(2)
4	-0.6882E-08	0.1443	A(3)
5	-0.7142	0.1780	A(4)
6	-0.6523	0.1744	A(5)
7	0.1823	0.2472	L(2)
8	0.3830	0.2368	L(3)
9	-0.8961	0.3506	PL(2).L(2)
10	1.013	0.2855	PL(2).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	7.559	0.5241
2	12	9.071	0.9726
3	9	11.09	-0.6267
4	10	7.244	1.024
5	2	8.693	-2.270
6	5	10.62	-1.726
7	7	7.559	-0.2033
8	14	9.071	1.637
9	16	11.09	1.476
10	1	3.701	-1.404
11	1	4.441	-1.633
12	4	5.428	-0.6129
13	3	3.937	-0.4722
14	7	4.724	1.047
15	10	5.774	1.759
16	21	12.35	2.463
17	1	6.047	-2.052
18	44	49.89	-0.8339
19	9	11.83	-0.8233
20	0	5.795	-2.407
21	66	47.81	2.631
22	9	12.35	-0.9524
23	15	6.047	3.641
24	35	49.89	-2.108
25	4	6.045	-0.8316
26	5	2.961	1.185
27	32	24.43	1.533
28	6	6.430	-0.1697
29	3	3.150	-0.8433E-01
30	21	25.98	-0.9778

* PROPORTION OF UNEXPLAINED VARIATION

TABLE 4

OMPUTER OUTPUT: TEST OF MULTIPLE INDEPENDENCE BETWEEN AREA OF
RESIDENCE IN THE CITY (A) AND INTENDED RETIREMENT IN HOMETOWN (RT)

FIT -PLH.RT + A.RT
DIS M E R
*SCALED DEGREES OF FREEDOM
CYCLE DEVIANCE (DF)
5 79.77 14

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR
%GM PLH A RT + A.RT

	ESTIMATE	S.E.	PARAMETER
1	2.159	0.1995	%GM
2	0.9016	0.1131	PL(2)
3	-0.4568	0.2932	A(2)
4	-0.6286	0.3096	A(3)
5	-1.792	0.4830	A(4)
6	-1.204	0.3801	A(5)
7	-0.8362	0.3320	L(2)
8	0.5691	0.2285	L(3)
9	-1.415	0.8141	A(2).L(2)
10	0.7491	0.3448	A(2).L(3)
11	1.431	0.4552	A(3).L(2)
12	0.5901	0.3665	A(3).L(3)
13	1.019	0.6906	A(4).L(2)
14	1.405	0.5291	A(4).L(3)
15	0.9416	0.5669	A(5).L(2)
16	0.6677	0.4422	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	8.661	0.1150
2	12	3.753	4.257
3	9	15.30	-1.611
4	10	5.486	1.927
5	2	0.5774	1.872
6	5	20.50	-3.423
7	7	4.619	1.108
8	14	8.373	1.945
9	16	14.72	0.3324
10	1	1.444	-0.3692
11	1	1.732	-0.5564
12	4	10.39	-1.983
13	3	2.598	0.2491
14	7	2.887	2.421
15	10	8.950	0.3509
16	21	21.34	-0.7330E-01
17	1	9.247	-2.712
18	44	37.70	1.026
19	9	13.51	-1.228
20	0	1.423	-1.193
21	66	50.50	2.181
22	9	11.38	-0.7057
23	15	20.63	-1.239
24	35	36.28	-0.2118
25	4	3.556	0.2352
26	5	4.268	0.3545
27	32	25.61	1.264
28	6	6.402	-0.1587
29	3	7.113	-1.542
30	21	22.05	-0.2236

* PROPORTION OF UNEXPLAINED VARIATION

TABLE 5

COMPUTER OUTPUT: TEST OF CONDITIONAL INDEPENDENCE BETWEEN PLH.RT + A.RT

FIT + PLH.RT
DIS M E R
*SCALES DEGREES OF FREEDOM
CYCLE DEVIANCE (DF)
4 36.96 12

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOT
%GM PLH A RT + PLH.RT + A.RT

	ESTIMATE	S.E.	PARAMETER
1	2.433	0.2324	%GM
2	0.4906	0.2318	PL(2)
3	-0.4568	0.2932	A(2)
4	-0.6286	0.3096	A(3)
5	-1.792	0.4830	A(4)
6	-1.204	0.3801	A(5)
7	-0.3788	0.3768	L(2)
8	-0.1674	0.3024	L(3)
9	-0.8961	0.3510	PL(2).L(2)
10	1.013	0.2855	PL(2).L(3)
11	-1.415	0.8141	A(2).L(2)
12	0.7491	0.3448	A(2).L(3)
13	1.431	0.4552	A(3).L(2)
14	0.5901	0.3665	A(3).L(3)
15	1.019	0.6905	A(4).L(2)
16	1.405	0.5291	A(4).L(3)
17	0.9416	0.5669	A(5).L(2)
18	0.6677	0.4422	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	11.39	-0.7088
2	12	7.800	1.504
3	9	9.636	-0.2050
4	10	7.215	1.037
5	2	1.200	0.7303
6	5	12.91	-2.201
7	7	6.076	0.3749
8	14	17.40	-0.8151
9	16	9.273	2.209
10	1	1.899	-0.6522
11	1	3.600	-1.370
12	4	6.565	-0.9949
13	3	3.418	-0.2260
14	7	6.000	0.4082
15	10	5.636	1.838
16	21	18.61	0.5546
17	1	5.200	-1.842
18	44	43.36	0.9664E-01
19	9	11.78	-0.8112
20	0	0.8000	-0.8944
21	66	58.09	1.038
22	9	9.924	-0.2933
23	15	11.60	0.9983
24	35	41.73	-1.041
25	4	3.101	0.5103
26	5	2.400	1.678
27	32	29.45	0.4690
28	6	5.582	0.1768
29	3	4.000	-0.5000
30	21	25.36	-0.8664

* PROPORTION OF UNEXPLAINED VARIATION

TABLE 6

COMPUTER OUTPUT: TEST OF CONDITIONAL INDEPENDENCE BETWEEN PLH.A+A.RT

FIT -PLH.RT + PLH.A
DIS M E R
*SCALES DEGREES OF FREEDOM
CYCLE 'DEVIANCE (DF)
5 60.32 10

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR
%GM PLH A RT + PLH.A + A.RT

	ESTIMATE	S.E.	PARAMETER
1	2.238	0.2372	%GM
2	0.7885	0.2202	PL(2)
3	-0.9822	0.3960	A(2)
4	-0.4189	0.3679	A(3)
5	-2.687	0.6337	A(4)
6	-0.9571	0.4443	A(5)
7	-0.8362	0.3320	L(2)
8	0.5691	0.2285	L(3)
9	0.6958	0.3473	PL(2).A(2)
10	-0.3218	0.3041	PL(2).A(3)
11	1.133	0.4894	PL(2).A(4)
12	-0.3830	0.3631	PL(2).A(5)
13	-1.415	0.8140	A(2).L(2)
14	0.7491	0.3448	A(2).L(3)
15	1.431	0.4552	A(3).L(2)
16	0.5901	0.3665	A(3).L(3)
17	1.019	0.6906	A(4).L(2)
18	1.405	0.5291	A(4).L(3)
19	0.9416	0.5669	A(5).L(2)
20	0.6677	0.4422	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	9.375	-0.1225
2	12	4.063	3.938
3	9	16.56	-1.858
4	10	3.511	3.463
5	2	0.3696	2.682
6	5	13.12	-2.242
7	7	6.167	0.3356
8	14	11.18	0.8444
9	16	19.66	-0.8247
10	1	0.6383	0.4527
11	1	0.7660	0.2674
12	4	4.596	-0.2779
13	3	3.600	-0.3162
14	7	4.000	1.500
15	10	12.40	-0.6816
16	21	20.63	0.8257E-01
17	1	8.938	-2.655
18	44	36.44	1.253
19	9	15.49	-1.649
20	0	1.630	-1.277
21	66	57.88	1.067
22	9	9.833	-0.2657
23	15	17.82	-0.6687
24	35	31.34	0.6531
25	4	4.362	-0.1732
26	5	5.234	-0.1023
27	32	31.40	0.1063
28	6	5.400	0.2582
29	3	6.000	-1.225
30	21	18.60	0.5565

* PROPORTION OF UNEXPLAINED VARIATION

TABLE 7

COMPUTER OUTPUT: TEST OF CONDITIONAL INDEPENDENCE BETWEEN PLH.A+PLH.RT

FIT - A.RT + PLH.RT
 DIS M E R
 * SCALED DEGREES OF FREEDOM
 CYCLE DEVIANCE (DF)
 5 60.51 16

Y-VARIATE FR
 ERROR POISSON LINK LOG

LINEAR PREDICTOR
 %GM PLH A RT + PLH.A + PLH.RT

	ESTIMATE	S.E.	PARAMETER
1	2.102	0.2399	%GM
2	0.3774	0.2991	PL(2)
3	-0.5680	0.3036	A(2)
4	0.2097	0.2457	A(3)
5	-1.609	0.4472	A(4)
6	-0.4055	0.2887	A(5)
7	0.1823	0.2472	L(2)
8	0.3830	0.2368	L(3)
9	0.6958	0.3473	PL(2)-A(2)
10	-0.3218	0.3041	PL(2).A(3)
11	1.133	0.4894	PL(2).A(4)
12	-0.3830	0.3631	PL(2).A(5)
13	-0.8961	0.3510	PL(2).L(2)
14	1.013	0.2855	PL(2).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	8.182	0.2860
2	12	9.818	0.6963
3	9	12.00	-0.8660
4	10	4.646	2.491
5	2	5.564	-1.511
6	5	6.800	-0.6903
7	7	10.09	-0.9730
8	14	12.11	0.5434
9	16	14.80	0.3119
10	1	1.636	-0.4975
11	1	1.964	-0.6877
12	4	2.400	1.033
13	3	5.455	-1.051
14	7	6.545	0.1777
15	10	8.000	0.7071
16	21	11.93	2.625
17	1	5.845	-2.004
18	44	48.22	-0.6079
19	9	13.56	-1.239
20	0	6.642	-2.577
21	66	54.80	1.513
22	9	10.67	-0.5107
23	15	5.225	4.276
24	35	43.11	-1.235
25	4	7.413	-1.254
26	5	3.631	0.7184
27	32	29.96	0.3735
28	6	5.424	0.2472
29	3	2.657	0.2105
30	21	21.92	-0.1963

* PROPORTION OF UNEXPLAINED VARIATION

TABLE 8

COMPUTER OUTPUT: TEST OF PAIRWISE ASSOCIATION AND SATURATED MODEL
ASSOCIATION PLH.A + PLH.RT + A.RT

FIT + A.RT
DIS M E R
*SCALED DEGREES OF FREEDOM
CYCLE DEVIANCE (DF)
4 26.62 8

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR
%GM PLH A RT + PLH.A + PLH.RT + A.RT

	ESTIMATE	S.E.	PARAMETER
1	2.467	0.2530	%GM
2	0.4358	0.2885	PL(2)
3	-0.7105	0.3797	A(2)
4	-0.5242	0.3642	A(3)
5	-2.515	0.6287	A(4)
6	-0.9626	0.4333	A(5)
7	-0.4280	0.3797	L(2)
8	-0.1117	0.3087	L(3)
9	0.3891	0.3628	PL(2).A(2)
10	-0.1782	0.3294	PL(2).A(3)
11	1.011	0.5131	PL(2).A(4)
12	-0.4356	0.3872	PL(2).A(5)
13	-0.8029	0.3692	PL(2).L(2)
14	0.9579	0.2925	PL(2).L(3)
15	-1.339	0.8173	A(2).L(2)
16	0.6800	0.3510	A(2).L(3)
17	1.396	0.4595	A(3).L(2)
18	0.6259	0.3728	A(3).L(3)
19	1.202	0.7019	A(4).L(2)
20	1.253	0.5349	A(4).L(3)
21	0.8563	0.5725	A(5).L(2)
22	0.7589	0.4513	A(5).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	11.78	-0.8106
2	12	7.680	1.559
3	9	10.54	-0.4736
4	10	5.790	1.750
5	2	0.9890	1.017
6	5	10.22	-1.633
7	7	6.976	-0.9270E-02
8	14	18.36	-1.017
9	16	11.67	1.269
10	1	0.9525	0.4869E-01
11	1	2.066	-0.7418
12	4	2.981	0.5900
13	3	4.500	-0.7069
14	7	6.906	0.3592E-01
15	10	8.595	0.4793
16	21	18.22	0.6519
17	1	5.320	-1.873
18	44	42.46	0.2359
19	9	13.21	-1.158
20	0	1.011	-1.005
21	66	60.78	0.6697
22	9	9.024	-0.8150E-02
23	15	10.64	1.336
24	35	39.33	-0.6911
25	4	4.048	-0.2362E-01
26	5	3.934	0.5376
27	32	33.02	-0.1773
28	6	4.500	0.7069
29	3	3.094	-0.5366E-01
30	21	22.42	-0.2969

* PROPORTION OF UNEXPLAINED VARIATION

APPENDIX VI

RESULTS OF THE TESTS OF MUTUAL INDEPENDENCE
BETWEEN PLOT OWNERSHIP IN THE HOMETOWN (PH)
AND INTENDED RETIREMENT IN THE HOMETOWN (RT)
BY STUDY AREA

TABLE 1

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE HOMETOWN AND INTENDED RETIREMENT IN THE HOMETOWN: DADIN KOWA AREA

FIT +PH+RT

DIS M E R

*SCALED

CYCLE DEVIANCE

DF

5 27.25

2

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT

	ESTIMATE	S.E.	PARAMETER
1	2.238	0.2372	%GM
2	0.7885	0.2202	PH(2)
3	-0.8362	0.3320	RT(2)
4	0.5691	0.2285	RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	9.375	-0.1225
2	12	4.063	3.938
3	9	16.56	-1.858
4	21	20.63	0.8257E-01
5	1	8.938	-2.655
6	44	36.44	1.253

FIT +PH+RT

DIS M E R

SCALED

CYCLE DEVIANCE

DF

3 0.1287E-08

0

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT PH.RT

	ESTIMATE	S.E.	PARAMETER
1	2.197	0.333	%GM
2	0.8473	0.3984	PH(2)
3	0.2877	0.4410	RT(2)
4	-0.7276E-11	0.4714	RT(3)
5	-3.332	1.113	PH(2).RT(2)
6	0.7397	0.5409	PH(2).RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	9	9.000	-0.8731E-10
2	12	12.00	-0.1008E-09
3	9	9.000	-0.8731E-10
4	21	21.00	-0.4001E-09
5	1	1.000	-0.3223E-05
6	44	44.00	-0.1931E-09

ESTOP

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE HOMETOWN AND INTENDED RETIREMENT IN THE HOMETOWN: TUDUN WADA AREA

FIT +PH+RT

DIS M E R

*SCALED

CYCLE	DEVIANCE	DF
5	25.60	2

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT

	ESTIMATE	S.E.	PARAMETER
1	1.256	0.3172	%GM
2	1.484	0.2686	PH(2)
3	-2.251	0.7432	RT(2)
4	1.318	0.2583	RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	10	3.511	3.463
2	2	0.3696	2.682
3	5	13.12	-2.242
4	9	15.49	-1.649
5	0	1.630	-1.277
6	66	57.88	1.067

FIT +PH.RT

DIS M E R

SCALED

CYCLE	DEVIANCE	DF
10	0.4540E-04	0

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT PH.RT

	ESTIMATE	S.E.	PARAMETER
1	2.303	0.3162	%GM
2	-0.1054	0.4595	PH(2)
3	-1.609	0.7746	RT(2)
4	-0.6931	0.5477	RT(3)
5	-11.28	127.3	PH(2).RT(2)
6	2.686	0.6529	PH(2).RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	10	10.00	-0.9203E-10
2	2	2.000	-0.6174E-10
3	5	5.000	0.9762E-10
4	9	9.000	0.8731E-10
5	0	0.2270E-04	-0.4764E-02
6	66	66.00	0.0000E 00

£ STOP

* PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TESTS OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE HOMETOWN AND INTENDED RETIREMENT IN THE HOMETOWN: KABONG AREA

FIT +PH+RT

DIS M E R

*SCALED

CYCLE	DEVIANCE	DF
3	2.450	2

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT

	ESTIMATE	S.E.	PARAMETER
1	1.819	0.2813	%GM
2	0.4666	0.2097	PH(2)
3	0.5947	0.3114	RT(2)
4	1.159	0.2865	RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	7	6.167	0.3356
2	14	11.18	0.8444
3	16	19.66	-0.8247
4	9	9.833	-0.2657
5	15	17.82	-0.6687
6	35	31.34	0.6531

FIT +PH.RT

DIS M E R

SCALED

CYCLE	DEVIANCE	DF
2	0.9354E-09	0

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT PH.RT

	ESTIMATE	S.E.	PARAMETER
1	1.946	0.3775	%GM
2	0.2513	0.5035	PH(2)
3	0.6931	0.4625	RT(2)
4	0.8267	0.4528	RT(3)
5	-0.1823	0.6257	PH(2).RT(2)
6	0.5314	0.5870	PH(2).RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	7	7.000	-0.7153E-05
2	14	14.00	-0.6928E-06
3	16	16.00	-0.4392E-06
4	9	9.000	-0.3090E-05
5	15	15.00	-0.5477E-06
6	35	35.00	-0.2979E-07

£STOP

*PROPORTION OF UNEXPLAINED VARIATION

TABLE 4

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
AND INTENDED RETIREMENT IN THE HOMETOWN: JENTA - ADAMU AREA

FIT +PH+RT

DIS M E R

*SCALED

CYCLE DEVIANCE DF
3 0.3732 2

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR
%GM PH RT

	ESTIMATE	S.E.	PARAMETER
1	-0.4489	0.5868	$\frac{1}{2}$ gm
2	1.922	0.4364	PH(2)
3	0.1823	0.6050	RT(2)
4	1.974	0.4768	RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	1	0.6383	0.4527
2	1	0.7660	0.2674
3	4	4.596	-0.2779
4	4	4.362	-0.1732
5	5	5.234	-0.1023
6	32	31.40	0.1063

FIT +PH.RT

DIS M E R

SCALED

CYCLE DEVIANCE DF
3 0.7299E-10 0

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR
%GM PH RT PH.RT

	ESTIMATE	S.E.	PARAMETER
1	0.3223E-05	0.9987	%GM
2	1.386	1.117	PH(2)
3	0.1783E-09	1.412	RT(2)
4	1.386	1.117	RT(3)
5	0.2231	1.564	PH(2).RT(2)
6	0.6932	1.236	PH(2).RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	1	1.000	-0.3223E-05
2	1	1.000	-0.3223E-05
3	4	4.000	-0.5239E-09
4	4	4.000	-0.4657E-09
5	5	5.000	0.6508E-10
6	32	32.00	0.1646E-09

£STOP

*PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE HOMETOWN AND INTENDED RETIREMENT IN THE HOMETOWN: ANGLO-JOS AREA

FIT +PH+RT

DIS M E R

*SCALED

CYCLE DEVIANCE DF
4 4.641 2

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT

	ESTIMATE	S.E.	PARAMETER
1	1.281	0.3756	%GM
2	0.4055	0.2887	PH(2)
3	0.1054	0.4595	RT(2)
4	1.237	0.3786	RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	RESIDUAL
1	3	3.600	-0.3162
2	7	4.000	1.500
3	10	12.40	-0.6816
4	6	5.400	0.2482
5	3	6.000	-1.225
6	21	18.60	0.5565

FIT +PH.RT

DIS M E R

SCALED

CYCLE DEVIANCE DF
3 0.2410E-09 0

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PH RT PH.RT

	ESTIMATE	S.E.	PARAMETER
1	1.099	0.5773	%GM
2	0.6931	0.7071	PH(2)
3	0.8473	0.6900	RT(2)
4	1.204	0.6583	RT(3)
5	-1.540	0.9880	PH(2).RT(2)
6	0.4879E-01	0.8047	PH(2).RT(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	RESIDUAL
1	3	3.000	-0.3503E.08
2	7	7.000	0.3850E-10
3	10	10.00	0.0000E 00
4	6	6.000	0.1069E-09
5	3	3.000	-0.3554E-08
6	21	21.00	0.0000E 00

APPENDIX VII

RESULTS OF THE TESTS OF MUTUAL INDEPENDENCE BETWEEN
PLOT OWNERSHIP IN THE CITY (PL) AND INTENDED
PERMANENT STAY IN THE CITY (L) BY STUDY AREA

TABLE 1

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE CITY AND INTENDED LENGTH OF STAY IN THE CITY: DADIN KOWA AREA

FIT +PL+L

DIS M E R

*SCALED

CYCLE DEVIANCE

DF

4 25.82

2

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L

	ESTIMATE	S.E.	PARAMETER
1	3.548	0.1549	%GM
2	-0.5909	0.2077	PL(2)
3	-0.9445	0.2572	L(2)
4	-0.7309	0.2386	L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	34.75	1.229
2	17	13.51	0.9480
3	6	16.73	-2.624
4	12	19.25	-1.652
5	4	7.485	-1.274
6	20	9.267	3.526

FIT +PL.L

DIS M E R

SCALED

CYCLE DEVIANCE

DF

3 0.5463.10

0

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L PL.L

	ESTIMATE	S.E.	PARAMETER
1	3.738	0.1543	%GM
2	-1.253	0.3273	PL(2)
3	-0.9045	0.2875	L(2)
4	-1.946	0.4364	L(3)
5	-0.1942	0.6450	PL(2).L(2)
6	2.457	0.5690	PL(2).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	42	42.00	0.0000E 00
2	17	17.00	-0.1200E-09
3	6	6.000	0.3564E-10
4	12	12.00	-0.1008E-09
5	4	4.000	-0.5239E-09
6	20	20.00	0.2603E-09

ESTOP

* PROPORTION UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP IN THE CITY AND INTENDED LENGTH OF STAY IN THE CITY: TUDUN WADA SAMPLE

FIT +PL+L
DIS M E R
*SCALED
CYCLE DEVIANCE DF
4 11.72 2
Y-VARIATE FR
ERROR POISSON LINK LOG
LINEAR PREDICTOR
%GM PL L

	ESTIMATE	S.E.	PARAMETER
1	3.327	0.1795	%GM
2	-1.686	0.2810	PL(2)
3	0.3953	0.2252	L(2)
4	-0.8575	0.3189	L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	29	27.84	0.2191
2	45	41.34	0.5686
3	7	11.81	-1.400
4	4	5.156	-0.5092
5	4	7.656	-1.321
6	7	2.188	3.254

FIT +PL.L
DIS M E R
SCALED
CYCLE DEVIANCE DF
3 0.9709E-09 0

Y-VARIATE FR
ERROR POISSON LINK LOG
LINEAR PREDICTOR
%GM PL L PL.L

	ESTIMATE	S.E.	PARAMETER
1	3.367	0.1857	%GM
2	-1.981	0.5334	PL(2)
3	0.4394	0.2381	L(2)
4	-1.421	0.4211	L(3)
5	-0.4394	0.7461	PL(2).L(2)
6	1.981	0.7551	PL(2).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	29	29.00	-0.3135E-09
2	45	45.00	-0.1952E-09
3	7	7.000	-0.3850E-10
4	4	4.000	-0.3492E-09
5	4	4.000	-0.6403E-09
6	7	7.000	-0.1155E-09

ESTOP

*PROPORTION OF UNEXPLAINED VARIATION

TABLE 3

TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP IN THE CITY AND
INTENDED LENGTH OF STAY IN THE CITY: KABONG AREA

FIT +PL+L

DIS M E R

*SCALED

CYCLE	DEVIANCE	DF
4	19.81	2

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L

	ESTIMATE	S.E.	PARAMETER
1	2.773	0.2082	%GM
2	-0.2877	0.2041	PL(2)
3	0.3314	0.2477	L(2)
4	0.1018	0.2607	L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	18	16.00	0.5000
2	30	22.29	1.634
3	8	17.71	-2.308
4	10	12.00	-0.5774
5	9	16.71	-1.887
6	23	13.29	2.665

FIT +PL.L

DIS M E R

SCALED

CYCLE	DEVIANCE	DF
2	0.9468E-09	0

Y-VARIATE FR
ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L PL.L

	ESTIMATE	S.E.	PARAMETER
1	2.890	0.2357	%GM
2	-0.5878	0.3942	PL(2)
3	0.5108	0.2981	L(2)
4	-0.8109	0.4246	L(3)
5	-0.6162	0.5474	PL(2).L(2)
6	1.644	0.5689	PL(2).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	18	18.00	-0.2935E-06
2	30	30.00	-0.5053E-07
3	8	8.000	-0.4585E-05
4	10	10.00	-0.2168E-05
5	9	9.000	-0.3090E-05
6	23	23.00	-0.1263E-06

ESTOP

*PROPORTION OF UNEXPLAINED VARIATION

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
IN THE CITY AND INTENDED LENGTH OF STAY IN THE CITY: JENTA ADAMU AREA

FIT +PL+L

DIS M E R

*SCALED

CYCLE DEVIANCE

DF

4

6.199

2

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L

ESTIMATE

S.E.

PARAMETER

1

2.495

0.2558

%GM

2

-0.7239

0.3046

PL(2)

3

0.1054

0.3249

L(2)

4

-0.4925

0.3827

L(3)

SCALE PARAMETER TAKEN AS

1.000

STANDARDISED

UNIT

OBSERVED

FITTED

RESIDUAL

1

13

12.12

0.2520

2

16

13.47

0.6895

3

4

7.408

-1.252

4

5

5.878

-0.3620

5

4

6.531

-0.9903

6

7

3.592

1.798

FIT +PL.L

DIS M E R

SCALED

CYCLE DEVIANCE

DF

3

0.2993E-09

0

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L PL.L

ESTIMATE

S.E.

PARAMETER

1

2.565

0.2774

%GM

2

-0.9555

0.5262

PL(2)

3

0.2076

0.3734

L(2)

4

-1.179

0.5718

L(3)

5

-0.4308

0.7677

PL(2).L(2)

6

1.515

0.8184

PL(2).L(3)

SCALE PARAMETER TAKEN AS

1.000

STANDARDISED

UNIT

OBSERVED

FITTED

RESIDUAL

1

13

13.00

0.1049E-09

2

16

16.00

0.1164E-09

3

4

4.000

-0.4651E-09

4

5

5.000

-0.6508E-10

5

4

4.000

-0.4366E-09

6

7

7.000

-0.3850E-10

ESTOP

*PROPORTION OF UNEXPLAINED VARIATION

TABLE 5

COMPUTER OUTPUT: TEST OF MUTUAL INDEPENDENCE BETWEEN PLOT OWNERSHIP
AND THE CITY AND INTENDED LENGTH OF STAY IN THE CITY: ANGLO-JOS AREA

FIT +PL+L

DIS M E R

*SCALED

CYCLE	DEVIANCE	DF
4	7.894	2

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L

	ESTIMATE	S.E.	PARAMETER
1	2.821	0.2241	%GM
2	-0.8473	0.3086	PL(2)
3	-0.4700	0.3291	L(2)
4	-0.7802	0.3641	L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	18	16.80	0.2928
2	13	10.50	0.7715
3	4	7.700	-1.333
4	6	7.200	-0.4472
5	2	4.500	-1.179
6	7	3.300	2.037

FIT +PL.L

DIS M E R

SCALED

CYCLE	DEVIANCE	DF
3	0.3619E-09	0

Y-VARIATE FR

ERROR POISSON LINK LOG

LINEAR PREDICTOR

%GM PL L PL.L

	ESTIMATE	S.E.	PARAMETER
1	2.890	0.2357	%GM
2	-1.099	0.4714	PL(2)
3	-0.3254	0.3640	L(2)
4	-1.504	0.5528	L(3)
5	-0.7732	0.8939	PL(2).L(2)
6	1.658	0.7843	PL(2).L(3)
SCALE PARAMETER TAKEN AS			1.000

UNIT	OBSERVED	FITTED	STANDARDISED RESIDUAL
1	18	18.00	-0.1235E-09
2	13	13.00	-0.1049E-09
3	4	4.000	-0.5821E-09
4	6	6.000	-0.1069E-09
5	2	2.000	-0.4997E-07
6	7	7.000	0.3850E-10

ESTOP

*PROPORTION OF UNEXPLAINED VARIATION