SPATIAL VARIATIONS IN ACCESSIBILITY TO SECONDARY SCHOOL FACILITIES IN OYO STATE

BY

ADEYEMO ADEMOLA MORAKINYO
B.Sc., M.Sc. (Ibadan). PGDE. (ABU, Zaria)

A Thesis in the Department of Geography submitted to the Faculty of the Social Sciences in partial fulfilment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

of the

University of Ibadan

July, 1988

ABSTRACT

The developing countries of the world have come to realise that issues involving human resource development and basic values may need to receive attention before regional problems can be successfully attacked either directly or indirectly, through sustained national economic growth. Need arises to tackle fundamental structural problems before growth and development can proceed to a point where it positively affects remaining structural problems. In the three preceding decades, Nigerian governments (civilian and military) have made various attempts to drastically raise the income level as well as the standard and quality of life of the people at both urban and regional scales. Since independence, elaborate social welfare programmes (health and education in particular) have always been an important feature of development planning in the old Western Region (now Oyo, Ogun, Ondo, Lagos and Bendel States). Education facilities are among the public services that profoundly affect human well-being the availability of which has far reaching implications for a people's income and quality of life and increases the attractiveness of an area. More recently, Oyo State government acknowledged the need to enhance the

quality of life of the people and increase their level of participation in decision-making and access to social opportunity.

Between October 1, 1979 and December, 1983, Oyo State government attempted to ensure equality of access to secondary schools in social and physical terms by the introduction of 'free education at all levels' and/or proliferation of secondary schools designed to remove any barriers to the consumption of secondary school education. The policy objectives in this regard have been to improve access to educational resources by distributing them among Local government areas equitably according to need, and to correct territorial injustices and maintain efficiency in the allocation of secondary school education resources among areas. But how far have these objectives been realized?

The main thrust of this study is to describe and explain the geographical variations in accessibility to secondary schools among a set of settlements and across Local government areas of the study area. The objectives therefore are to: examine the implications of State government policy (1979-1983) on accessibility of the people to secondary schools; determine the level of provision of secondary schools among Local government areas in relation

to needs; examine the extent to which state citizens are better or worse off as a result of government policy on education; examine the extent to which proliferation of secondary school facilities in the State has improved distributional efficiency; and find out the major factors that determine the distribution of secondary schools in a typical region of a Third World country.

In doing this work both population and secondary school data were used and they were collected from secondary sources; while data on physical distance from facility location point to user settlement was generated from the base map. The methods of analysis employed include access opportunity model as put forward by Schneider and Symons (1971), Gini-coefficient, Lorenz curves and ratio of advantage or disadvantage, planning standards as laid down by Ministry of Education and multiple regression model.

This study has revealed some facts about the distribution of secondary schools before and after 1979-1983 education programme in the State. The study shows that mass provision of secondary school facilities has increased accessibility of the population in the State to secondary school education. Enrolments in secondary schools increased from about 11% in 1978 to 36.3% in 1983.

In 1978, 50% of secondary schools was controlled by 39% of the population of the State but this increased to 45% in 1983. This implies that state government policy on secondary school education has increased people's access to a larger share of the facilities by 6%. Average access opportunity to secondary schools and teachers increased by 140.51 and 108.80 percent respectively in 1983; while total population without secondary schools declined by 54 percent. Total weighted distance declined from 32,009,271 in 1978 to 9,844,663 person kilometres in 1983; while in 1983 mean weighted distance decreased by 49 percent. The mass establishment of secondary schools has also redistributed secondary school facilities in a more egalitarian direction than ever before. The spatial concentration of secondary schools and teachers in urban areas declined by 7 and 3 percent respectively while proportion of the population controlling 50 percent of secondary schools and teacher in the rural areas increased by 13 and 18 percent respectively.

Thirdly, the increased number of secondary schools has not improved the distributional optimality with which the facilities were delivered. Inefficiency in the distribution of secondary school teachers and schools was overwhelming during the periods. Proliferation of secondary school facili-

ties has not altered the inefficiency level of social service delivery system in Nigeria. The level of inefficiency that characterizes the system has remained relatively stable over time. Fourthly, the study has shown that egalitarian approach to the provision of social services has substantially reduced inequalities and inequities in secondary school provision. The result is that disparities between the spatial pattern of need and spatial pattern of secondary school provision got reduced. There was redistribution of services in a more egalitarian direction than before. The study shows that decentralization of schools is less efficient, but it is more equitable in the sense that differences among urban and rural areas, between and within local government areas have been reduced. There was no evidence that State government made any efforts to implement the laid-down distributional standards in the provision of secondary schools in the State hence the high level of inefficiency in the distribution of secondary schools among Local government areas of the State. Finally, the relationship between need (population) and provision of secondary school facilities was considerably stronger than any other identified explanatory variables implying

that territorial justice exists with regards to the distribution of secondary schools in Oyo State. It shows that social and territorial justices can only be sustained if services are distributed in relation to population (need) rather than on the basis of political considerations. Areas of high population concentration attract social services and other developmental infrastructure than areas of scanty and scattered population. The observed mis-match between enrolments and provision of teachers revealed that the quantitative growth of secondary school resources was not accompanied with development. In the provision of secondary school facilities (1979-1983) there was growth but no development.

The structure of this thesis is as follows. Chapter one gives the background to the study; while Chapter two deals with conceptual and theoretical framework and literature review. The extent to which mass provision of secondary schools in the State improved access opportunity to secondary schools in 1983 was examined in Chapter three; while levels of inequity in the distribution of secondary schools among Local government areas, and between urban and rural areas were examined in Chapter four. Although mass provision of secondary school, increases access opportunity of the population to secondary school education,

yet it does not improve the optimal distribution of secondary school facilities among Local government areas of the State. Chapter five confirms this postulate; while Chapter six looks at factors that shape the spatial aspects of secondary school facilities in the State. Chapter seven is conclusion.

ACKNOWLEDGEMENT

My doctoral research has been conducted not through my personal efforts alone, but also through the countless and appreciable major and minor assistances received from here and there. First and foremost, therefore, I should like to thank God for His infinite love, protection, guidance and gift of good health all through my studies I must single out for praise and gratitude my chief research adviser, Dr. S.I. Abumere who, through his personal intellectual quality and his interest in this work, has greatly reinforced my interest in academic endeavours. For his many constructive criticisms, unfailing guidance and motivation, I am grateful indeed. I cordially and warmly thank his correlator, Dr. S.I. Okafor, for accepting to guide and direct my research orientiation at the initial stage, his motivation and deep interest in welfare geography made me to see the radiance in the dark. Drs. S.I. Abumere and S.I. Okafor's encouragement and wise counsel have benefitted a host of undergraduate and post-graduat students in the University of Ibadan, and I am fortunate to be included in that roster. To complete this round, I also owe all the staff members of Geography Department a debt of gratitude especially Professors O. O.

Areola, M.O. Filani and J.S. Oguntoyinbo, for their encouragement and advice; to Drs. C.O. Ikporukpo, T.O. Egunjobi, Bola Ayeni, and B.F. Iyun for their valuable advice and provision of high-quality intellectual resources in the form of learned journals, books and other relevant articles to my research field.

I am indebted to many friends and colleagues in particular Dr. H.O. Adesina and Mr. Adeagbo Akingbade both of Ibadan Polytechnic, and Dr. (Rev.) M.A. Osunade of Obafemi Awolowo University, Ile-Ife, for their financial and moral support; Drs. J.S. Opakunle, D.O. Babalola, and A.I. Awujoola, Messrs G.A. Olasinde, S.G. Odewumi, Adegboyega Ajiboso, Bisi Popoola and others from College of Education Ila-Orangun for their encouragement, interest and support. My gratitudes also go to Messrs 'Dokun Olajide (I.B.W.A., Dugbe, Ibadan), R.A. Alabi and A. A. Adeniji of O.A.U. Bookshop, Ile-Ife for their material gifts.

I am also grateful to the Provost and Registrar of the College of Education Ila-Orangun, Dr. A.O. Afolayan and Mr. D.F. Oroniran respectively for releasing me for few months from my teaching assignment in the College and for their encouragement throughout the period of my studies.

I also thank Dr. S.O. Omotoso, Pioneer Provost College of Education Ila-Orangun, and Dr. Tunji Ladapo, Provost St. Andrews College of Education, Oyo, for their invaluable help.

There were countless others who gave me significant spiritual, financial, and moral support during the hectic days of my research. I must mention especially the families of Mr. & Mrs. Oyekola Oyewo, Mr. & Mrs. J. F. Adeyinka, Mr. & Mrs. Adesoye Adekeye, Mr. & Mrs. Olawole O., Mr. & Mrs. Gbade Oyewole, Mr. & Mrs. L.C. Obiagwu and Mr. & Mrs. Adeniyi Akinwande for their support along with generous hospitality; to my brothers Samuel Adeyemo and Akinniyi Adeyemo for their active and generous encouragement. Nor will the contributions of the other members of my houseold in particular Messrs Adeoye Ojo, Akingbade Adeyemo, Oyelekan Ojo, Miss Bose Akinwande and Miss Iyabo Ojo be forgotten. I am abundantly grateful to Messrs Ogunlola P.L., Farayola F.O. and Gbenga Ojuade for typing the manuscript of the first draft; Mr. Ajibade Akingbade for typing the final version of the thesis; and Messrs Tayo Kehinde (Ibadan Polytechnic) and 'Seyi Fasina for admirably performing the catographic chores. I thank Mr. J.O. Abikoye for his support.

Finally, I thank my wife, 'Femi, for her continual encouragement, providing support for sagging spirits in

times of need and her loving patience and devotion. That she could endure a long period of 'divorce' or neglect and attention lavished on her 'rival', this thesis, is a tribute to her forbearance and fortitude.

CERTIFICATION

I certify that this work was carried out by Mr. A. M. Adeyemo under my supervision in the Department of Geography, University of Ibadan.

SUPERVISOR

S. I. ABUMERE
B.Sc. (Ibadan) Ph.D. Bristol
Reader
(Regional Development and Planning),
Department of Geography,
University of Ibadan.

DEDICATION

This work is primarily dedicated to my departed loving and disciplined parents: Chief Moses O. Adeyemo and Madam Felicia A. Adeyemo.

TABLE OF CONTENTS PAGE

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

BACKGROUND, AIMS AND OBJECTIVES OF THE STUDY

1.1 Introduction

The crucial problem of development in many developing countries of the world is inaccessibility or poor access of the people to social welfare services in both urban and rural areas. Adequate access to social welfare services such as medical services, education, potable water, electricity, motorable roads, adequate food and shelter, adequate clothing and acess to employment opportunities and so on, are marks of development. There appears to be increasing concern for social welfare services and their distribution over people and over space. Reflecting this concern is an increasing interest in the allocation of resources by the public sector, in particular the location of public facilities, as well as the social and political underpinnings and consequences of existing patterns and policies (Humphreys, 1985). Economic development has currently been viewed as both 'redistribution with growth' and meeting the basic needs of the masses of the population. The basic needs approach stresses the need for development to provide the necessities for a

decent livelihood to the largest majority of the population. However, a redistribution of social and economic facilities in a more egalitarian direction is in itself a mark of development. One of the basic components of human wellbeing or the quality of life is education. Education is relevant to access to employment and income and also to political power.

Generally speaking, the level of education attained by an individual or a community provides an adequate if not a perfect collective representation of the concept of wellbeing. In both developed and less developed countries of the world the development planners have addressed themselves to the critical issue of how to reduce social inequalities and promote individual's quality of life. Against this background, Oyo State Government introduced a 'free education at all levels' scheme between 1979 and 1983 . A major problem in the social welfare facility provision and distribution in the state relates to the provision of adequate social and infrastructural facilities among small and scattered population and settlements. The state government responded to these problems by attempting to increase the number of secondary schools and by making attendance free thus making it more accessible to the

eligible population.

The approach to educational planning in the country has laid emphasis on gross expansion such as in the number of secondary schools and/or pupil enrolments to the total neglect of location and spatial aspects of secondary school provision. Resource allocation to social welfare services were incrementalist rather than redistributive involving the 'use of last year's budget with a bit added here and a bit taken off there. Consequently the allocation methods tended to perpetuate the status quo, especially in the secondary school education system. And the status quo favoured some areas at the expense of others' (Humphreys, 1985).

1.2 Rationale Of The Study

Public facilities have recently attracted the attention of geographers probably because of their interests in spatial variations in the quality of human well-being and national development. Educational services are provided both privately and publicly in order to improve the individual's productivity and status in the society and for maximum mobilization of the country's resources. Reasonable access to public facilities is a fundamental right yet within countries and metropolitan areas of both developed and less developed countries

serious discrepancies exist between demand and supply of these facilities (Humphreys,1985). The unequal distribution of public resources in both developed and LDCs represents a major problem especially within regions of the LDCs of the world. This is true because development is associated with location of social service facilities. Most governments acknowledge that there is a moral responsibility to reduce such imbalance between and within regions of their respective countries. The elimination of illiteracy may be as much a political and social goal as a powerful means of accelerating economic growth or reducing income disparities among the people. The major planning objectives of Nigeria's economic development planning since the first national development plan period (1962-68) were to create a just and an egalitarian society.

In the Third National Development Plan, the educational objectives were stated thus:

> "The objectives and policies of educational system in Nigeria are geared to expand facilities for education aimed at equalizing individual access to education throughout the country, expansion with equity consideration in view, will be guided by the need for even distribution of facilities on geographical and population basis" (Nigeria, 1975).

The location of public facilities such as health and educational services had been left for a long time without an over-all locational strategy, partly because both local, state and federal governments are empowered to make regulations on them, and partly because they have been treated as social amenities that are given to the people according to the benevolence or whims and caprices of the people in power (McNulty, Ayeni, Filani and Olaore, 1984).

The study area, Oyo State, is one of the most educational developed in the country, partly because of its early exposure to western education and partly because since 1955, the state has enjoyed a succession of administrations that placed a great premium on education. Since colonial era through 1979, secondary school facilities were provided by both public and private agencies. Voluntary agencies located their services where they wished free of significant constraints. The 'two-tier' system of public and private secondary schools was fraught with problems of inadequacy of places and concentration of of schools in a few urban centres and certain areas of the State. Before 1979, concern expressed by providers of secondary schools related more to cost-effectiveness

rather than improving the quality of life of the masses or their accessibility to secondary school education. In a free market economy the geographical distribution of voluntary agency schools tends to be positively influenced by concentration of potential clients (secondary school-age population), high income groups (usually found in urban centres who tend to have an inelastic demand for secondary school education for their children and availability of other social infrastructures. This is because private entrepreneurs are profit maximizers and therefore they locate their economic activities in areas of high population concentration and in places where affluent consumers are concentrated. Areas of sparse population and scattered settlements tend to be unattractive to private entrepreneurs because such areas have no adequate threshold population to justify the location of economic activities or social services as schools and hospitals. Based on these reasons secondary schools were concentrated in the administrative centre in Ibadan and a few Divisional headquarters to the neglect of rural areas before 1979. Polarised distribution of social welfare services can also be explained in historical context.

Oyo State has rain-forest and savannah areas. The rain forest of the south and south-east of the state has relatively fertile soils which are capable of supporting industrial crops such as cocoa, oil palm; while the savannah areas of the north and west of the study area support the cultivation of food crops. The main emphasis of colonial development plans was confined to building up transport and communications system and encouraging the production of a limited range of export crops. Consequently, fertile areas of Oyo State, like in any other ex-colonial territories in Africa, that produced export crops such as cocoa, oil palm, rubber, and so on, received colonial attention. The low level of development in the savannah areas of the west and the north is often traced to the neglect during the colonial administration. The fact is that unlike the areas to the south (cocoa-belt) which produced exportable crops, the savannah areas of the north and west produced mainly food crops such as yams which turned out not to be of interest to the British. The northern and western parts of Oyo State did not therefore receive the attention of colonial adminstration by way of roads, schools, health care facilities or any developmental infrastructure. Regional

imbalances and inequities or a state of polarised distribution of educational resources existed in the State prior to 1979.

During the Third National Development Plan (1975-1980) Oyo State government noted the inadequacies in the supply of secondary schools vis-a-vis demand in the state. In the light of these facts, the state government accepted 'responsibility not only to provide free education to all citizens of the state but also to bring it within their reach. The policy therefore is that schools will be sited such that no child shall walk more than five kilometres to get to school. The policy of the state government is to make provision for 100 per cent transition rate from primary to secondary school (Oyo State, 1981). In these secondary schools the costs are borne by the State, and all persons who require secondary education, regardless of socio-economic status, are able to receive secondary education without being personally billed for the costs. In this way, Oyo State government has been able to argue that it provides secondary education on the basis of an equal access principle and has always assumed that secondary education is equally available to all secondary school-age population.

This policy has led to a tremendous increase in the number of secondary schools, high enrolment rates and increased costs of provision of education. For instance, in 1978, there were 234 secondary schools in 101 different locations in the State with a total enrolment of 116,744, the corresponding figures for 1983 were 691 schools in 203 locations and a total enrolment of 457,477 (See Table 3.12). The ratio of total population to schools equally decreased from 4,973 in 1978 to 1,823 in 1983. This rate of decreas is by all standards phenomenal and constitutes one major reason for an analysis of spatial accessibility and efficiency in the distribution of secondary schools in the state. A change in government educational policy from 'fee paying' to 'free education at all levels' or from Private ownership to public ownership could affect the spatial patterns of accessibility of secondary schools to settlements and/or populations.

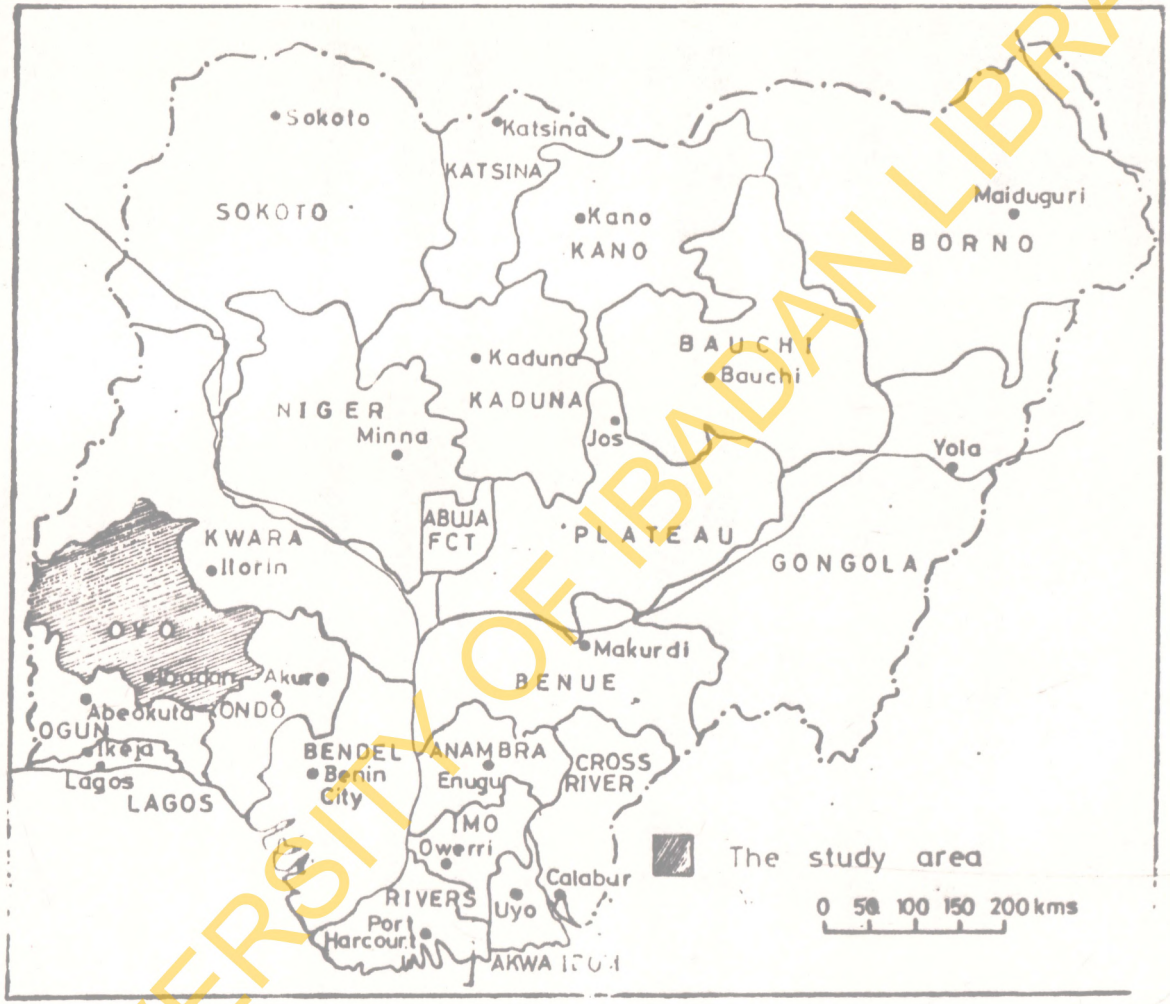
The questions that arise are: (1) Does mass provision of secondary schools in Oyo State improve accessibility of settlements and/or population to secondary schools? (2) Are secondary schools more equitably distributed in 1978 than in 1983? (3) Does increase in the number of secondary schools among local government areas of Oyo

state necssarily improve the level of efficiency with which these facilities are delivered? (4) What factors determine the distribution of secondary schools in the study area?

Since 1955 through 1979 education has been in the priority list of Old Western Region government, but available literature shows that researchers have not evaluated state government education policies to see whether citizens are better or worse off as a result of state government education policies. Thus, the critical issues of accessibility, participation and inequality in the distribution of education services among local government areas and between urban and rural areas have barely been addressed by researchers.

This thesis is designed to evaluate and describe the spatial variations in accessibility to secondary schools in Oyo State. Put another way, this thesis seeks to find out whether settlements and/or population in Oyo State are better or worse off as a result of 'free education at all levels' scheme practiced in the state between October 1979 and October, 1983. The thesis also seeks to find out the extent to which mass provision of secondary schools has improved optimal distribution

FIG1.1: Map of 21 states of Nigeria showing the study area



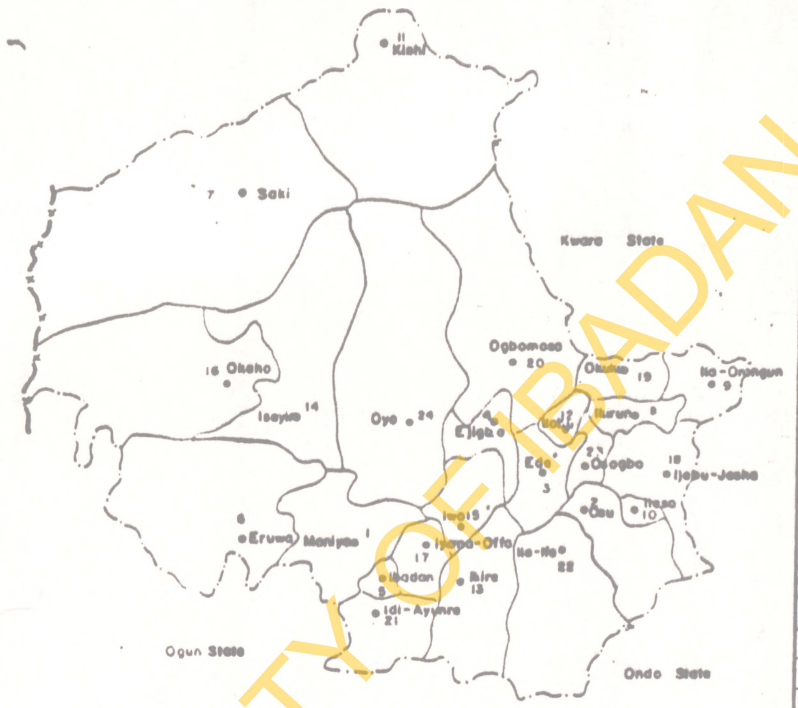
of schools across local government areas, and the urban and rural areas of the study area.

1.3 Objectives of the Study

The main focus of the study is to evaluate government policy on secondary school education and describe and explain spatial variations in accessibility to secondary schools in Oyo State at two different time periods, 1978 and 1983. Based on the overall aim of the study therefore, the objectives of the study include:

1. to determine whether the free education policy practiced in Oyo State between 1979 and 1983 has improved citizens' accessibility to secondary schools more than ever before.
2. to determine the extent to which the spatial distribution of secondary schools reflects the geographical distribution of population among local glvernment areas of Oyo State. The degree of congruence between availability and distribution of secondary schools with pattern of social and spatial variation in need for them is to be established in this study.
3. to evaluate the provision of secondary schools from a spatial efficiency point of view. The

FIG. 1.2: MAP OF OYO STATE SHOWING THE LOCAL GOVT. AREAS



No	LOCAL GOVERNMENT AREAS
1	AKINYELE
2	ATAKUNMOSA
3	EDE
4	EJIGBO
5	IBADAN MUNICIPAL
6	IBARAPA
7	IFEDAPO
8	IFELODUN
9	ILA
10	ILESA
11	IREPO
12	IREPODUN
13	IREWOLE
14	ISEYIN
15	IWO
16	KAJOLA
17	LAGELU
18	OBOKUN
19	ODO-OTIN
20	OGBOMOSO
21	OLUYOLE
22	ORANMIYAN
23	OSOGBO
24	OYO

INTERNATIONAL BOUNDARY
STATE BOUNDARY
STATE ADMINISTRATIVE BOUNDARY
LGA. HEADQUARTERS
SCALE: 1 : 1250,000

efficient location of schools may result in reduced physical distance travelled to schools by pupils.

In addition, the study is interested in determining the major factor(s) influencing the spatial distribution of secondary schools in the study area.

1.4 The Study Area

Oyo State came into existence on April, 1976 when the former Western State of Nigeria was divided into Oyo, Ogun and Ondo States. Oyo State is one of the 21 States of Nigeria (Fig. 1.1) and is divided into 24 local government areas (Fig. 1.2). It has a total land area of 35,742.84 km^2 with an estimated secondary school-age population of 1.1m and 1.26m in 1978 and 1983 respectively.

Basically Oyo State is an agricultural State and about 75 percent of its population are engaged in agricultural activities. There are both rainforest and savannah areas in the State. In the rainforest areas of the South and South-East are fertile soils that support the cultivation of crops such as cocoa, oil palm, kolanuts, coffee and so on; while the woodland savannah areas of the West and North support the cultivation of food crops such as yams and maize which turned out not to be of interest

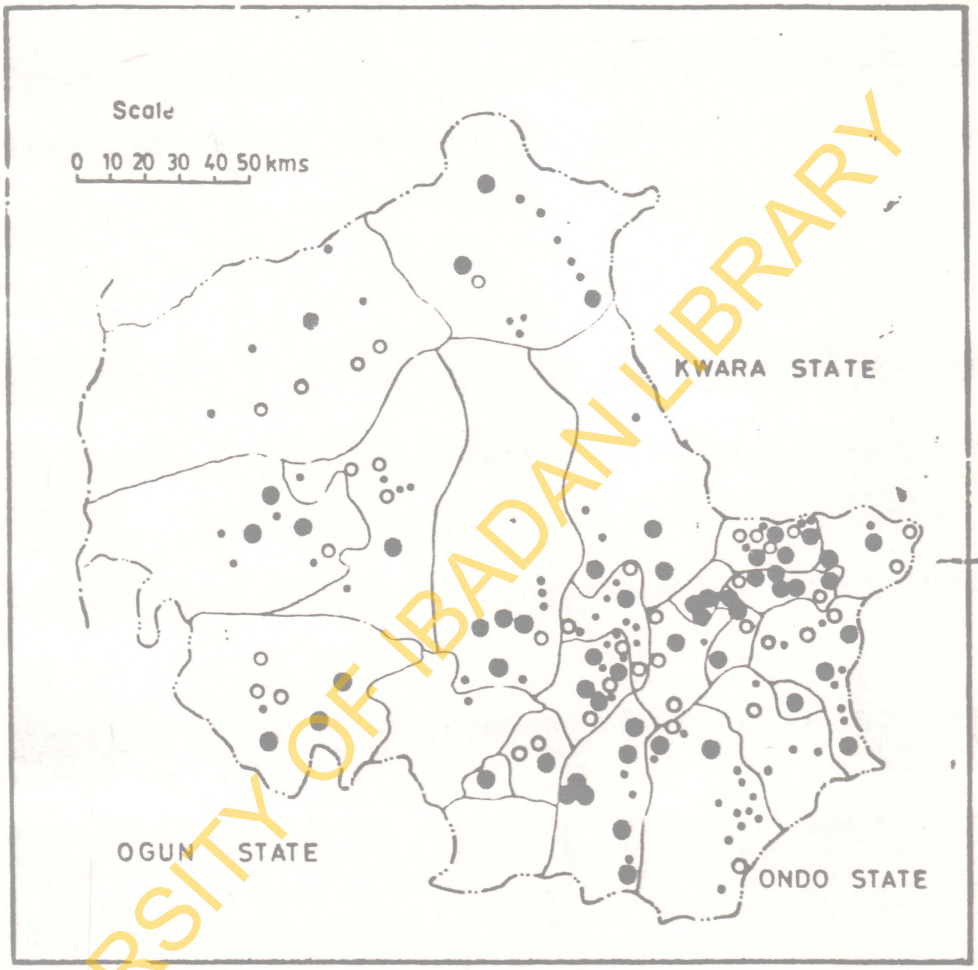


FIG. I·3: The Spatial distribution of Urban Centres and Towns in Oyo State, 1983.

(Figures based on 1963 Census figures)

● Above 20,000 ○ 10000–19000 • 5000–9,999

to the British. The production of industrial crops such as cocoa and oil palm made the South and South-East (the cocoa-belt) to be attractive to colonial administration and thus received the attention of colonial administration by way of roads, schools, potable water, electricity or any developmental infrastructures. The savannah areas of the West and North were neglected by the colonial administration in terms of socio-economic infrastructures.

The State has developed educationally and since 1955 it has enjoyed a succession of administrations that placed great premiums on education. Before 1978 school fees were paid by recipients of secondary school education, and between October 1979 and October 1983 free secondary school education was introduced in the State. The main ethnic group in the state is Yoruba. In 1983, 97.22% of the State was made up Yoruba. Other ethnic groups live and work in Oyo State. These include Ibo, Hausa, Urhobo, Edo, Fulani and so on.

Different types of religion are practiced in the State. In 1983 the dominant religions were Islam, Christianity and Traditional Religion. In 1983, 55% of the population in the study area were muslims while 37% were christians and about 8% practice other traditional religions (Oyo State, 1983). Religion has never been a barrier to western education in the State. Both muslims and christians accepted western

education in the study area with enthusiasm. Rivalry between christians and muslims in the establishment of community secondary schools also contributed to the spatial imbalance in the distribution of schools in the State in the sense that areas where muslims and christians co-exist have more schools than areas dominated by either the christians or muslims. As Fafunwa (1974) has noted that 'it was the thought of material benefit, that encouraged a rapid increase in the number of schools in Southern Nigeria'.

One of the most striking characteristics of Oyo State (and elsewhere in other Yoruba dominated states of Nigeria) is the high propensity of the people to live in extra-ordinary nucleated settlements, many of which pre-date the advent of European (Mabogunje, 1968; Hodder and Ukwu, 1969). The whole phenomenon of Yoruba urbanism has been clearly associated with the relatively advanced social and political development of the Yoruba comapared with most African peoples (Hodder and Ikwu, 1969). In 1983, Oyo State had 56 urban centres (Fig. 1.3) with an average population density of 240 persons per km^2. Not less than 62% of the State population lived in these various urban centres in both 1978 and 1983. Oyo State

population is therefore essentially urban in character. However, the degree of urbanization varies from one local government to another.

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 The Concept of Accessibility

Probably the most complex and important of all tasks facing those concerned with the provision of any social service is the two-fold challenge of organizing a limited set of resources in a way which is efficient and yet equitable. In practical terms, this inevitably reduces to the fundamental dilemma of having to rationalize the supply of services while at the same time maintaning or improving the accessibility of these services to the consumer (Knox, 1979a). The problem of accessibility is particularly acute in the provision of social services in the LDCs of the world. Accessibility is a slippery notion; it is one of those common terms that everyone uses until faced with the problem of defining and measuring it (Gould, 1969). It is a key concept for characterising a fundamental principle of human activity and therefore, to make the concept a useful tool for describing, explaining or predicting human organisation and behaviour more precise definitions are needed. Recent studies involving the explicit examination of location by governments, international planning agencies and research organisations reflect a

more widespread appreciation for the fact that the choice of location for a facility will reflect the costs, efficiency and utilization of that facility. Indeed access to essential resources and services has come to be recognized as positi ,vely related to development so that the lack of access is cited as evidence of under-development (Moseley, 1979). Consequently, improving accessibility to essential services has become an accepted part of the rubrics of development planning (Ayeni, 1987)

The concept of access has been employed in a large number of studies by geographers and other scientists and planners and has thus taken on a variety of meanings. Burns (1974) notes that these include the physical proximity of two or more places, the activity opportunities available in a geographical region and the freedom of individuals to decide whether or not to participate in different activities such as work, shopping and recreation. Moseley (1979) on the other hand has used the term to describe the deprivation of rural population in Britain where he sees accessibility as basically relating to people's ability to reach those things which are important to them. Ayeni, Rushson and McNulty (1985) employed the concept to describe the spatial distribution of health

care delivery systems relative to the distribution of population in the rural areas of Ogun State. Owens and Shaw (1972) define the concept as it relates to development as follows:

> The key concept we shall use is that of access to a nation wide system of production, distribution and consumption. Small farmers and businesses need access to the means of production, the financial system, the markets and to technical knowledge. Workers need access to remunerative employment and to suitable goods on which to spend their incomes. All these groups need access to a range of social services such as power, transport, schools and health facilities. Only if these needs are met will the majority of the population become participating members in the national life of the society.

Accessibility, therefore, is the relative balance between the demand for, and the supply of, consumer services over geographical space and bridging the gap between these is the very purpose of transport.

The concept of accessibility thus incorporates two subsidiary notions: (a) relative and (b) integral accessibility (Nutley, 1979; Ingram, 1971).

Relative accessibility is defined as the degree to which two places on the same surface are connected;

while integral accessibility is defined for a given point as the degree of interconnection with all other points (or facility locations) on the same surface. The operational form of integral accessibility is regarded as being dependent upon the derivation of a set of relative accessibilities of a point (Ingram, 1971). There are various ways of measuring accessibility and they include measures developed by Schneider and Symons (1971); Knox (1979); and Smith (1977). The Schneider and Symons measure of accessibility is probably the most widely used one and the index developed by other authors for example, Jones and Kirby (1982), are based on it. Basically, therefore, the access opportunity model as defined by Schneider and Symons is employed in this study to explain geographical variations in accessibility to secondary schools from the point of view of settlements. Classification of Local government areas based on accessibility scores is simplified thus enabling the identification of advantaged and disadvantaged Local government area in the study area.

There is no single accepted definition of public services as there is as yet no generally accepted theory of public facility location (Seley, 1981; Lea, 1981; Teitz, 1968). Boulding (1971) referred to unilateral

or nonreciprocal benefits provided whether or not the recipient can pay; while Humphreys (1985) referred to public facilities as 'collective consumption goods' or public provision of socially necessary facilities and services, commodities that are not priced in the market place. Lineberry (1977) defined public services as the services performed by municipalities as those vital to the preservation of life, liberty, propoerty and public enlightenment; while Teitz (1968) identified them as publicly financed and publicly operated facilities. Nonetheless, the lack of accepted definitions, the ever-changing landscape of publicly sponsored and legislated services, the constant shift from public to private ownership and management (and vice versa), and the interdependence of public and private activities render definitions complex and often irrelevant or harmful, independent of place and time (Seley, 1981).

These conceptualization of public services encompass notions of unilateral benefits, social services, public funding, organization and administration; public planning and public evaluation. Lea, (1981) and Walker, (1981) identify the basic attributes of public goods to include non-exclusion, joint supply and non-rejectability.

The attribute of non-exclusion implies that once the good has been made available to one person, it cannot be withheld from another person wishing to consume it. On the other hand, joint supply implies that once the good has been made available, equal quantities of identical quality are made available to any number of additional people at no additional costs; while the property of rejectability means that once the good is supplied, it must be fully and equally consumed by all (Lea, 1979). The definition denotes involvement by the public (or its representatives in paying for, using and assessing the services (Seley, 1981; Ayeni, et al, 1985). The intervention of the state becomes necessary to take charge of the sectors and services that are non-competitive (from the point of view of capital) but necessary for the functioning of economic activity and/or appeasement of social conflicts (Castells, 1975).

A definition of public services include four components: purpose, structure, evaluation and allocation. Concern with purpose is a concern with the more basic relationship between a given service(s) and society. The problem with public service is not just a problem with individual services but with the economic, cultural and

political environments under which a public service develops. There are many reasons for the development of public services in a society. Some authors have questioned the use of public services to mitigate conflict by buying off dissident segments of society. Thus, Galper (1975) and Piven, et al (1971) asked: are services simply compensatory for failures in the private market, or are they designed to enhance life for all citizens? On the other hand, do public services reinforce inequities of the private market, establishing dependence and ensuring control over certain potentially disruptive segments of the population?

The structure of public services focuses on their form, organization and administration. Evaluation is concerned with the efficient and effective use of public service resources to improve service delivery. In other words, evaluation may be concerned with structure, but rarely addresses purpose. More commonly evaluation addresses structure only within a narrow framework of change. The ultimate objective function of a system evaluation is to find out whether citizens are better or worse off as a result of a particular government service delivery. Other methods of evaluation, aside from systems

analysis, are modelling or survey research. The goal of evaluation studies is to improve efficiency, equity, quality or reliability of service delivery (Lineberry, 1977).

The fourth theme, allocation, focuses on the actual delivery of services. It is at this level that the issues of structure, evaluation, and, to a limited extent, purpose, appear most clearly in focus, answering to the demand for delineating where services go (Seley, 1981; Young, 1975; Onokerhoraye, 1984).

State involvement in the provision of educational facilities and services has been justified in a number of ways. These include the necessity to stimulate economic growth, to advance culture and to promote social cohesion and national unity. But perhaps the major motivation has been the pursuit of equality, equity and efficiency, a theme that has appeared in the writings and public pronouncements of innumerable social thinkers and policy makers. Hence it is necessary to establish the actual distributional criteria of educational facilities and services as far as possible.

De Jong and Rutten (1983), have outlined four basic principles of distribution: Utilitarian (an efficiency goal involving maximizing the surplus of benefits over

costs); egalitarianism (where any social service status e.g. education/health is equalised by giving priority to those in most need); equal access (where everyone has equal access regardless of what or how much is provided) and Libertarian (where distribution results from freely negotiated transfers in the market place. In order to analyse distributions of schools realistically there is need to differentiate three concepts: efficiency, equality and equity.

2.2 Efficiency and Equity in the Location of Public Facilities

The efficiency criterion is defined as choosing a resource configuration that maximizes the benefits to consumers by satisfying their preferences for treatment in different locations. While the criterion would differ from one facility to facility, it is also reasonable to accept that it could differ from one ecological zone or region to another in the same country. Efficiency and equity are two concepts that feature prominently in discussions about the provision of public facilities and yet remain only very little understood by planners and analysts (Alonso, 1972; Fieldman and Gonen, 1975; McGuire and Garn, 1969; Humprey, 1973, and Symons, 1973

cited by Ayeni, 1987). The theoretical literature by emphasizing issues of efficiency without paying as equal attention to equity does not help the case either (McAllister, 1974; Morril and Symons, 1977). However, recent and increasing interest in normative questions about public facilities location has brought both issues into greater focus.

Location theory tends to interpret efficiency as one synonymous with optimality and would describe an efficient system as one whereby profits are maximum in a perfectly competitive system. Thus any shift in location or intensity of production at a location from this optimum would reduce system profits and hence efficiency Morrill and Symons, 1977). For public facilities where no profits are sought, an efficient location would be one in which some societally prededermined level or volume of service is met at at minimum total system costs of operation and travel. In this situation, efficiency may be seen as involving the minimization of total travel either through the computation of the point of minimum aggregate travel or bivariate mean; or the point of maximum potential. The simple area centroid reduces variability of access i.e. the greatest distance any one has to travel while

the bivariate mean as the centre of gravity yields a location of intermediate efficiency and variability of accessibility. On the other hand, the point of maximum potential yields a location of highest efficiency for the seller and greater variability in accessibility by assuming that demand or utilization varies inversely with distance (Morrill and Symons, 1977). However, in as much as the services under consideration are travelled - for goods, one way of measuring the level of locational efficiency is some analysis of the extent to which existing locations minimize the burden of transportation i.e. minimize average or aggregate transportation cost from consumers to the sources of supply.

The issue of spatial equality of acessibility requires the distribution of education services to be related to the population that constitutes potential users. Spatial equity is defined as a distribution of resources to each area according to the needs of the population of that area (Davies, 1968). A perfectly equitable distribution of schools in each area correlates perfectly with the spatial distribution of need for the service. To achieve equality in results (educational attainment, level of health, and so on) may require inequality in

resource allocation, whether the subjects are people or places. Equal allocation of resources can produce inequalities in living standards. This suggests two alternative views of equality: perfect equality of treatment in the sense of the same quantity of benefits and penalties going to all, and equality of treatment in the same circumstances where circumstances can justify different quantities (Smith, 1977).

The concept of equity can be measured through the adoption of some socially imposed minimum standards with which patterns of equitable location of particular facilities may be considered equitable if less than a small proportion of people are more than this critical standard. This interpretation of equity becomes reasonable when one bears in mind that the pattern of the distribution of settlements is both important to the evaluation of equity, and the assessment of the ways in which the distribution of settlements meets the requisite thresholds for the provision of facilities.

The emphasis in the distribution of social services in Nigeria appears to be on proportional equality based on population or need. However, equating population with needs seems to be motivated by the desire to ensure some equity of service delivery systems for the different

communities in Nigeria. The concept of need provides two important advantages: it allows the critical examination of the adequacy of service provision and it helps to identify overserved and underserved areas in the service delivery system. Rich (1979) argues that efficiency and equity are two concepts that are difficult to achieve simultaneously in the service delivery systems. He said:

> An equitable arrangement is one which promotes greater equality of condition. Services are equally distributed when everyone gets the same services. They are equitably distributed when citizens are in a more nearly equal life circumstance than before. This concept of equity in servie distribution is closely akin to the standard of 'equal results' ... it opens the possibility that equity and equality may be incompatible (Rich, 1979).

It is important to relate public services to client needs which vary from place to place. This is to say that an equitable distribution of services or secondary schools would be one that allocates schools to different Local government areas on the basis of client population or secondary school-age population (aged 12-17 years).

There are theoretical situations when in a spatial world, equity and efficiency could be synonymous. For instance in a situation where all people have equal income and information the location of residents and activities

in a city would be such that all residents irrespective of location would be well-off because greater distance and transport costs would be off-set by lower rents. In the same way if income is equal and if there is a constant density of population, the Christaller Losch regular lattice for the provision of services or facilities would be indicators both of equity and efficiency especially if the service centres provide free delivery of services to all consumers. However, if customers must pay transport charges, the resulting pattern would show some inequity as the customers who live farther from service centres would in a way be disadvantaged as they would obtain fewer goods or services for the same amount of income as people who live close by (Ayeni, 1987).

Equity and efficiency are without doubt both interesting and challenging themes for theoretical and empirical studies of location. They closely relate to problems of scale and density and variation of population distribution (Morrill and Symons, 1977). Furthermore, they amplify in many suitable ways, the concept of access and physical accessibility, its measurement and determination in an objective way that incorporates issues of uneven population distribution and elements of the physical separation of people from service centres.

2.3 The Distribution of Secondary Schools in Oyo State: State's Distributional Principles

One common concept which can provide a common frame of references for the planner and the researcher as far as planning and analysing the provision and distribution of public services in Nigeria is concerned is 'Planning Standards'. This is defined as specification by which the qualities required of a social service e.g secondary schools, may be tested. There are both normative and positive planning standards in social service provision. Normative planning standards represent targets to be achieved given certain conditions while positive planning standards represents some measure of current planning practice.

Before 1979 the distribution of secondary schools among Local government areas in the State had no laid down distributional principles and as such market forces played a dominant role in the allocation of secondary schools. The distribution principles that underscored the allocation of secondary schools between 1979 and 1983 were that:

1. Schools are to be allocated among Local government areas in the State on the basis of geographical spread and even distribution;

2. Schools are to be located on the basis of threshold population or need;
3. Schools are to be located within 3-5 km. walking distance from pupil's home;
4. Teachers are to be distributed among schools on the ratio of one teacher to one and half classrooms; and
5. Pupils are to attend schools within their Local government area.

For the first time in the history of educational planning in Oyo State both the distributional and locational principles were incorporated into the educational planning scheme. In establishing secondary schools the state government had a laid down standards to be fulfilled by individual proprietors or communities before approval was given to such schools. The State government locational standard was designed to generate locational efficiency of schools in the State. The threshold population of a secondary school in Nigeria is the minimum population that justifies the allocation of scarce financial and personnel resources to its establishment and maintenance. This threshold population depends on the minimum acceptable enrolment for individual schools. The standard class size in most parts of Nigeria is about forty pupils. The

official optimum or efficient size of secondary schools in Oyo State in 1983 was 5 streams of 40 pupils per class for each of the five classes in urban areas. Consequently efficient school in urban areas would require about 1,000 pupils. In the rural areas settlements are scattered thus increasing the distance a pupil would walk to reach schools. To insist on the standard of 1,000 pupils per school in the rural areas would lead to denying rural secondary school-age population of their rights to secondary education. There were differentiated standards in the establishment of schools in both urban and rural areas. The optimum size of a secondary school in the rural areas in 1983 was 3 streams of 30 pupils per class for each of the five classes. In the rural areas therefore, an efficient school would have a total number of 450 pupils on its enrolment in 1983.

In 1978 the official standard size of a secondary school in urban centres was three streams of 35 pupils per class for each of the five classes. This means that in 1978 an efficient school in urban centres was one with a total enrolment of about 525 pupils. In the rural areas the efficient school was supposed to have 2 streams of 30 pupils per class for each of the five classes in 1978.

Consequently an efficiently located school in the rural areas in 1978 was one with a total enrolment of 300 pupils. The distributional efficiency of secondary schools in urban centres was premised on 525 and 1,000 pupils per school in 1978 and 1983 respectively. On the other hand, the distributional optimality of secondary schools in the rural areas in 1978 and 1983 was based on 300 and 450 pupils per school respectively. These are the normative distributional standards with which the distribution of schools in both 1978 and 1983 will be judged.

Normative distributional standards are essentially levels of generalization and the approach has certain advantages. Firstly, it enables recommendations based on research to be more widely disseminated and it provides a ready made answer to problems encountered both in incremental planning situations and in total planning (Onokerhoraye, 1982).

Normative planning standards in educational provision focus on the distribution, location and accessibility of secondary schools, for example, in relation to the population which is supposed to use them.

2.4 The Location of Public Facilities

Although there is no generally accepted theory of public facility location yet it is agreed that certain

concepts from central place theory and welfare economics provide springboards for the understanding, theory development and analysis of the location of public facilities (Walker, 1981; McAllister, 1976).

As a theory that purports to explain the factors of location, number, sizes and spacing of central places, 'Central Place Theory posits that for goods that must be centrally provided, there is need for the existence of a threshold which ensure that there exists a minimum number of people that generate enough demand to keep the business running. Furthermore, there exists a maximum distance beyond which consumers would find it more profitable to visit a nearer central place. This maximum distance was called the range of goods (Berry, 1967; Christaller, 1933). Moreover goods and services are of various orders, it is usual to expect that they would possess varying threshold and ranges, but because centres that provide high order goods and services can also provide lower order goods and services, the pattern of market areas that develop is such that the market areas of lower order goods nestle in that of higher order goods (Losch, 1954). Furthermore it can be shown that under the assumptions of central place theory, the optimal pattern for the location of central places is

one of the hexagonal pattern of market areas, where the central places are located at the apices of the hexagon.

Although central place theory was not developed for the analysis of public services, certain postulates of this theory, such as those of range and threshold are undoubtedly useful and incisive. In areas characterized by a relatively primitive state of transport, consumers are unable to travel very far to buy goods because of the time needed to overcome the friction of distance (Garner, 1967). If adequate threshold population could not be met within appropriate range such a social service wouod not be provided. For instance, there is little sense in locating a secondary school in a small remote village which can neither provide basic infrastructure for the survival of the school nor whose population cannot provide enough children to constitute a viable threshold. Furthermore, also applicable is the deduction that persons wishing to consume a public service are likely to be influenced by the distance separating them from the facility as well as by other centres that offer the same or comparable levels of services; and hence are likely to patronize the location that is closest to them (Ayeni, et al 1986).

In a country as Nigeria, where one of the aims of national development planning is the creation of an

egalitarian society issues of equity and accessibility are crucial to the modernization process. To the extent that the provision of such services as health, education and infrastructural facilities require the existence of a threshold; a balanced and well integrated urban system provides a means of delivering these facilities (Ayeni, 1978). One of the difficulties of concentration of social services provision in villages is that the range and threshold of each of the facilities inevitably varies, and that inevitable some of the facilities will operate at less than optimum efficiency. Thus large settlements are better able to satisfy the threshold requirements for central services than small settlements (Okafor, 1982).

Settlements and population are not evenly distributed in space, therefore unbalanced regional provision of social facilities, especially secondary schools, the provision of which depends on settlements nucleation and population concentration, generally follows. The spatial inequality models of unbalanced growth and development as put forward by Perroux (1955), Hirschman (1958), Myrdal (1957) and Friedman (1972) are relevant to the understanding of polarised distribution of social welfare facilities, for example, secondary schools. As said earlier, there are rainforest and savannah areas in Oyo State. These areas

have different soil fertility. Defferences in soil fertility and rainfall encourage different crop production. The production of industrial crops (cocoa, Oil palm and coffee and so on) dominates the south and south-east whild food crops production predominates in the savannah areas of the western and northern areas of the study area. The 'cocoa-belt' of the south and south-east constitutes the core or pole region while the savannah areas form the periphery.

The logic of Hirschman (1958) and Myrdal (1957) theory of 'polarisation and tricke down effect' is that productive investments should be concentrated in urban industrial centres or 'few core areas' so as to take advantage of external economies, labour specialization and cummulative-causation processes. It is then that from these dynamic growth centres development would 'trickle down' to the rest of the spatial economic system (Darwent, 1969, Hansen, 1981; Friedman and Alonso, 1975; Moseley, 1974). The result of cummulative growth in the 'core region' (cocoa-belt) leads to backwash effects upon the lagging areas (for example, the savannah or food production areas of the western and northern areas of the study area). The consequence of such conditions is the perpetuation of an economy with a dynamic growing area

existing side by side with a stagnating one. In so far as the objectives of this thesis are concerned these aspects of the Hirschman-Myrdal spatial inequality theory are relevant.

2.5 Methodology

2.5.1 Methods of Data Collection

This study focuses attention on geographical accessibility to, and equitable distribution of secondary schools among settlements and local government areas of Oyo State. Attention is also paid to the distributional efficiency of secondary schools among Local government areas and the possible factors that have influenced the distribution of secondary schools in Oyo State. The spatial units of analysis are the 24 Local government areas of Oyo State. In the study of this nature the information normally rquired consist of data on the location and distribution of population (in each of the 24 Local government areas) and settlements in the study area; data on the route network and the cost of transportation on it; data on the number of secondary schools in each settlement where schools are located and number of urban centres in each of the 24 local government areas. The choice of the data was determined by the focus of the

study and availability and reliability of the data. Information on the location and distribution of population in the study area consists of an identification of the location of settlements that appear both on the map and in the 1963 census list, and the estimation of their populations from the 1963 census data base using a growth rate of 2.5 percent per annum. Physical distance between secondary schools location and each settlement was generated from the base map (local government area map of Oyo State; 1985 edition). Aside from physical distance data, all other information used in the study were collected from secondary sources.

The towns and settlements that had at least one secondary school in both 1978 and 1983 were identified on the map. In a town where more than one secondary school are located the total number of schools was obtained simply by adding them together. For each secondary school location point, the number of and enrolments in, were obtained. Population for each of the settlement where school(s) were located and user settlement was estimated from 1963 census data base. In each local government area settlements that appear on the base map but do not appear on 1963 census data base are disregarded. Also population on grouped settlements are also disregarded. This is because

population projections based on them would give false impression on the size of the settlement leading to distortion of facts. The base map does not show all settlements in each local government area partly because the map is not up-to-date and partly because of the scale used in drawing the map. The reduction of scale entails a great loss of detail which is reflected in the limited names of settlements shown on the map. At Local government level large scale maps which would have included all settlements within each Local Government area are not available. This is perhaps due to lack of cartographic and surveying personnel and equipment.

The lists of secondary schools in Oyo State, 1978 and 1983, were obtained from the Ministry of Economic Planning, Ibadan. This enabled the locations of schools to be identified on the map. The distance between user settlement and facility location points was measured in centimetres on the map and converted to kilometre using the scale factor. In order to obtain the total and average travel burden, the distance separating facility location point and user settlement was discounted or weighted by settlement population.

Distance between settlements and facility location points could not be measured in terms of cost or time

either. This is because not all settlements shown on the map are connected by motorable roads, and besides transport fares are not fixed. Transport fares along the Nigerian roads depend on the whims and caprices of the touts, the amount of load carried by each passenger, and the 'state' of the roads. State of the road here refers to both their physical condition and the volume and frequency of passenger traffic on them (Okafor, 1977; Haggett, et al. 1977). Time distance could not be used either because in Nigeria, as in other LDCs, there is no fixed time-table for commercial and public transport. This situation is further complicated by the fact that private vehicles are used as commercial vehicles in Nigeria. Consequently, the measurement of transportation cost is done by the use of intersettlement physical distances as a surrogate for cost or time of transportation. Indeed, Kirby (1983) noted that straight-line distance and travel time will not produce very different results when used to measure friction.

However, physical distance has certain limitations. First, the measure considers only physical distances, while ignoring transportation factors and time and monetary constraints on travel. The method in effect, assumes that a unit of distance is equally important or has equivalent

impact on all service users. Second, the method ignores important social, economic and psychological barriers to service use (Gillespie and Marten, 1978). Hence the use of physical distance as a measure of accessibility is problematic. However, it indicates physical availability of services to the population or settlement at large (McLafferty, 1982). Kane (1969) however viewed that 'physical distance could have a much more significant effect on utilization of public services for low-than for high-income groups'.

The study utilized (1) aggregate population, (2) Secondary school-age population (aged 12-17 years) for each Local government area and for urban and rural areas in each Local government area. Since 1963, there has been no acceptable population census in Nigeria. Hence projected population figures were employed in this study and the data were obtained from the National Population Bureau (Demographic Division) Lagos and the Ministry of Economic Planning (Local government statistics Division) Ibadan. At both National and State levels, mid-year estimates of population figures were calculated on the basis of a constant growth rate of 2.5 percent because of the inflation of about 10-12 percent of 1963 census data (National Population Bureau, 1984).

Projections were calculated by using natural logarithms derived by the equation:

$$P_1 = PO^{ern} \quad - - - \quad (1)$$

where

P_1 = Population at some future date;

PO = the base year or initial population;

r = annual growth rate (0.025 for all parts of Nigeria except Lagos);

n = number of years between the base year and the future date; and

e = the mathematical constant which forms the basis of the natural or Napierian Logarithm (Barclay, 1958).

There is a sense in which we might regard any population based on growth rates derived from Nigeria's censuses with suspicion. This is because the rates cannot by any stretch of imagination, be expected to be any more reliable than the census figures from which they were derived (Abumere, 1984). And again Ibadan, the administrative headquarters of Oyo State is not growing at the same rate as other parts of the state. In so far as there are no alternatives for obtaining accurate population figures for the study area the projections derived from the above

stated model can serve as a useful benchmark from which we could obtain needed demographic data.

In order to obtain urban population figures for 1983, the urban population figures for each of the Local government areas were added and the results were substracted from the total Local government araa population. By this it was possible to obtain urban and rural populations for each Local government area of the state. Four local government areas are essentially urban viz: Ibadan, Osogbo, Ilesa and Irepodun; while Akinyele, Atakumosa and Oluyole have no urban centres.

The demand for secondary school education is age-specific (12-17 years population) rather than the aggregate population within a community. Secondary school age group (12-17 years) was not included in the census list. However, both the UNESCO and Federal Ministry of Education (Statistcs Section) and Federal Office of Statistics (F.O.S.) regard 14.6 percent population of any community as representing secondary school-age population (Nigeria, 1985). In this study, secondary school-age population represents client population and not the gross population of each Local government area. since the total population, urban and rural populations of each Local government area have been projected to 1978 and 1983, secondary school-age

population for each Local government area was obtained by calculating 14.6 percent of either Local government area population or urban population. This method thus leaves out under-aged and over-aged population and can be used to formulate educational programmes and for the assessment of progress at various time periods and specific localities within the country (Onokerhoraye, 1984).

The fourth set of data used in this study is that on settlement. Data on number of settlements in each Local government area presented some problems. In 1979, the National Population Bureau, Lagos instructed each of the 301 Local government areas in the country to prepare a comprehensive list of all the settlements in their respective Local government areas. This was in preparation for the anticipated census originally slated for 1983. As usual each Local government area inflated the number of settlements in its area and compiled fictitious settlement names. As an example, Odo-Otin Local government area which had about twenty settlement names on 1963 census list now has 60 settlement names on its list. Atakumosa which had 158 settlement names on the 1963 population census list now records 226 settlement names. The sudden 'growth' of settlements in a country of about 5%-11% urban

population growth rate (Sada and Oguntoyinbo eds. 1978) and high rural-urban population movement is embarrassing and highly suspicious.

Taking all these problems into consideration, therefore, settlement analysis on Local government area basis was restricted to the settlements shown on the base map. In order to obtain the number of settlements in each Local government area, counting of settlements on the base map and on Local government area basis was resorted to. The number of settlements in each Local government area was counted and divided by the total land area (Km^2) to obtain settlement density for each Local government area. The number of urban centres in each Local government area was counted to give the actual number of urban centres for each Local government area. The degree of urbanization is the proportion of an area's total population in cities of 20,000 or more people. For each Local government area, the estimated degree of urbanization was calculated. The total population in the urban centres of each Local government area under consideration and the result was multiplied by 100. This method was applied to calculate urbanization index for the whole state (See Mabogunje, 1974).

Total land area for each Local government was obtained from official records in the Ministry of Lands and Housing (Surveying Division) Ibadan. However, the problems of changing administrative boundaries surfaced. Such changing administrative boundaries has not affected secondary school data significantly. For instance, the town of Tewure was formerly under Oyo Local government area but is now put under Ogbomoso Local government area. Secondary schools in the town were then put under Ogbomoso Local government area. The same was applied to aggregate population in the town. As for the land area, changes were reflected in the official records of the Ministry of Lands and Housing.

The lengths of trunks 'A' and 'B' roads were equally obtained from the official records of the Ministry of Lands and Housing (Traffic Section) Ibadan. Lengths of trunks 'A' and 'B' roads were added together to obtain total length of roads in each Local government area. simply, the road density was obtained by dividing the total length of roads (km) in each Local government area by the total land area (km^2). Simply, the road density was obtained by dividing the total length of roads (km) in eacl Local government area by the total land area (km^2).

2.5.2 Methodes of Data Analysis

The choice of a location for a facility affects the costs, efficiency and utilization of that facility. Access to social service often determines the quality of life of people. In evaluating the accessibility of secondary schools across settlements and Local government areas of the study area the access opportunity model as defined by Schneider and Symons (1971) was wmployed. There are certain advantages in the application of the model. It is capable of describing variations in the provision and physical availability of a facility in any area. It is indeed a maximum measure of the degree of access in the distributional system of social services and one against which empirically determined degree of access at different time and places may be compared. Furthermore, classification of Local government areas based on their accessibility scores to secondary schools is facilitated by this method and thus poorly served and highly advantaged Local government areas are identified.

Okafor (1986) used the model to describe the pattern of accessibility to doctors in the city of Ibadan; while Knox (1979) applied the model to analyse geographical variations in accessibility to general practitioners in

the city of Aberdeen. Nutley (1979) also used the model to describe spatial variations in the physical availability of secondary schools in N.W. Highlands and Islands of the Great Glen (Scotland).

There are other measures of accessibility. The general approach for the anlysis of problems of this nature is the P-median version of the general location - allocation analysis (Cooper, 1967; Hakimi, 1965; Scott, 1971). The P-median problem otherwise called the public facilities location model involves the determination of P facility locations on the network of an area of n distributions of population such that weighted aggregate travel distance or cost is minimized.

This study is not concerned with the population coverage of secondary schools in each of the 24 Local government areas but with the distributional efficiency. Therefore, the P median version of location - allocation model is not employed in this study. However the access opportunity model as put forward by Schneider and Symons (1971) was used to measure changes in accessibility to secondary schools in 1978 and 1983.

The principle which underscored Oyo State government 'free education at all levels' policy was egalitarian - the pursuit of equality of access to education. It regarded

access to education as a basic right and not a privilege. In this way the political party in power in the state (October, 1979 - October 1983) was able to argue that it provided education services on the basis of an equal access principle and had always assumed that education services (for example secondary school services) were equally available to those in most need. The best known inequality index is the Gini coefficients which can compare the percentage frequency of some attribute with an equal distribution (Smith, 1977). The coefficient is a single measure of the extent to which a condition or activity is spatially concentrated by comparison with some other distribution (Smith, 1975, 1977). This other distribution is usually the distributional criterion, which in this study is the index of need for secondary school education, namely, the size of secondary school-age population, or more specifically, the percentage distribution of secondary school-age population between local government areas.

One graphical device for the expression of inequality is the Lorenz curve. It is related to the Gini-coefficient and in drawing the curve, territories are ranked according to their ratio of advantage (Smith, 1977; Hammond & McCullagh, 1978), and the cumulative percentages

of teachers or secondary schools (x) are plotted against the cumulative percentages of secondary school-age population (Y). The Gini-coefficient and Lorenz curve are helpful devices for the evaluation of territorial distribution on the basis of equality. In this study these techniques were used to guage the extent of inequality and equality in the allocation of secondary school services in Oyo State.

Distributional equity may be interpreted in terms of social justice with respect to location (Harvey, 1973) therefore, its measurement can then be seen to arise if it is felt that some members of the society are not receiving adequate attention in the distribution of facilities. Since secondary schools are distributed in the study area on the basis of threshold population it stands to reason to measure the degrees of departure of distribution of secondary schools from the set standards. However, the concept of equity may also be operationalized through the adoption of some socially imposed standards with which patterns of location of particular facilities may be judged (Morrill and Earickson, 1969). Therefore, the distribution of secondary schools relative to the distribution of population in each Local government area

represents the basis for the measurement of equity in this study. This model is employed to test the second hypotheses.

Educational services, the focus of attention in this study, are travelled - for goods and the cost of transportation is usually borne by the consumers. Consequently, a measure of the efficiency of its location would be the ease with which people travel to the centres of consumption. Distributional efficiency provides a requisite model for a more rigorous examination of the issues of access, equity and efficiency. Distributional efficiency of secondary schools is tested in this study on the basis of some distributional principles as defined in Section 2.3. These relate a given population to recommended number of schools or teachers.

The distance separating a facility location point and a user settlement in either 1978 or 1983 is weighted by the settlement population in order to measure total weighted distance or total travel burden to school. For each user settlement in each of the 24 Local government areas total weighted distance and total distance were calculated by dividing the total distance (Km) or total weighted distance (Person km.) by the number of settlements. By this method, it was possible for the researcher

to obtain total distance or total weighted distance, average distance or average weighted distance for each of the 24 Local government areas in 1978 and 1983. Total distance or average distance (Km) and total weighted or average weighted distance (person km.) to secondary schools in 1978 and 1983 were thus measured. This facilitated comparisons of the degrees of accessibility to secondary schools before and after the free education policy of 1979-1983.

The distributional optimality of secondary schools in 1978 and 1983 was measured by using the distributional standards as set out in Table 5.1

2.6 Literature Review

The provision of social welfare facilities (health and education, for example) is a few examples of a wide range of social services, the availability of which is not only a major dterminant in the level of well-being or quality of life enjoyed by households, but also, on occasions essential for survival. Education services are made available both privately and publicly in order to improve individual productivity and staus in the society and for maximum mobilization of the country's resources. Reasonable access to public social welfare facilities is

a fundamental right; yet within countries and metropolitan areas of both developed and LDCs serious discrepancies exist between demand and supply of social welfare facilities and services (Humphreys, 1985).

Geographers' interest in the study of regional variations in educational development derives from their general interest in the spatial variation of phenomena on the earth's surface. But, more importantly, this interest derives from the importance of education to individuals and nations and from the realisation that inter-personal variations in educational development are often manifested in space by socio-economic differences and inequalities between nations. For the individual, education is an important determinant of the quality of life (Okafor, 1986). The spatial perspectives has a distinctive contribution to make to the field of planning as a redistributive activity. In particular, the question of access to sources of human need or want satisfaction stresses the importance of location and distance (Smith, 1977).

Godlund (1958) has studied accessibility in combination with a calculation of total travelling times in order to divide the country (Sweden) into regions for

medical service. In this study, he partly used connections with trains and buses and partly car transport as hinterland determining parameters. This method used by Godlund needs intense studies of time tables if one uses small distances between the isochrones. The time-tables may be difficult to get specifically if one wants to study a distant point of time. Besides, it is difficult to get a pure transportation hinterland without certain assumptions about supplementary transports by car. Therefore, it is much easier to construct a traffic hinterland on the basis of car-transport only (Holm, 1970). Torqvist (1963) has measured accessibility on the basis of road and railroad and distances between different places. In much of LDCs of the world, however, some settlements are neither connected by road nor railroad and therefore the use of road distances and timetalbes is irrelevant in measuring accessibility index of settlements to the services provided. Who gets what thus depends on where one lives, implying that location is an important determinant of the availability of public services.

The intra-urban patterns of accessibility are fairly well known for Western Cities although some of the results are somewhat contradictory with regard to the observed patterns as well as their interpretations (Okafor, 1986).

In Britain, for instance, Knox (1979) has shown that in some cities the spatial pattern of health care provision is regressive, tending to sustain the idea of an 'Inverse care law' (Hart, 1971); with the availability of good medical care varying inversely with the need of the population served. By applying access opportunity model to describe the location of surgeries in 19 social, economic, demographic and housing characteristics of each of the census enumeration districts in the city of Aberdeen, Knox found out that there remained a remarkable degree of localization of medical manpower in high-status neighbourhoods of the city, whereas there were some low-income districts such as Kincorth which suffered relative deprivation of medical manpower (Knox, 1979).

Some research in North America confirm these views. Rosenberg (1983), for example, observe that '... physicians are distributed in the middle and upper class and older, prestige areas of the cities at the expense of poorer less prestigious areas'. Doctors are attracted to high socio-economic status neighbourhoods even when such areas are over-doctored'.

With reference to Hamilton, Ontario, urban area, Ingram (1971) calculated both relative and integral

accessibility measures of 466 enumeration areas in the city. The calculation of various accessibility measures was based on the central point of each enumeration area. By calculating integral accessibility, using both straight-line and rectangular distances, he produced various maps showing variations in accessibility of the enumeration districts. The isopleths of integral accessibility show a gradual decline away from the centre of the Hamilton CBD. The area of highest accessibility stretches from the centre of the CBD towards the east. There is a visible tendency in Hamilton for new commercial enterprises to locate to the east of the national centre". However, Ingram concluded that: 'in the application of the measures of accessibility developed here to other cities, or in regional studies, it may be sufficient to use straight line rather than rectangular distances ... The technique may also be useful in measuring the integral accessibilities of one set of points with respect to another set of points, for example, the accessibility of work places to residential locations" (Ingram, 1971).

A somewhat discordant opinion was advanced by McLatterty (1982) who asserts that: "Service attributes such as size and staffing do not systematically disfavour

poorer neighbourhoods. In most of the three morphologically different sample cities that she studied, she noted that lower-income groups did not appear to be consistently disadvantaged in terms of the access to recreation or library facilities. Using a simulation model for two hypothetical and one real-world data set, she argues that this may in fact result from the spatial configuration of many western cities, which renders grossly inequitable service distributions unlikely. In short, "the significance of the spatial constraint relates fundamentally to broader issues of equity in the location of public services. Each city presents a different set of possibilities to decision makers and thus limits the objectives that can be achieved in locating human services" (McLarfferty, 1982). Using correlation analysis to address the question of differential geographical access to public services she noted that the locational outcome of municipal politics reflects not only the power, resources and motivations of political actors, but also explanatory factors such as urbab residential patters, site availability, and physical and environmental constraints on siting. The spatial configuration of urban residential patterns limits differential accessibility of service locations to income groups. However, she was quick to speculate how the results would

vary for a third concentric city. In such the locations of low and high income groups are often reversed, with poor households residing in low-density squatter settlements on the fringe of the city. It is likely that the effect of the spatial constraint would be just the opposite of that observed here, with the majority of locations more accessible to high than to low-income groups (Misra and Sarma, 1979). As a consequence the spatial form of the Third World City accentuates the already severe problems of effective public - service provision to low-income groups. Further research is needed to determine the exact relationship between spatial form of the city or spatial constraint elements at regional scale in LDCs and the characteristics of the set of possible locations (McLafferty, 1982).

Comprehensive studies of parks, library and police services analysed both the locations and characteristics of service facilities in an effort to uncover bias or discrimination against low-income groups (Coulter, 1980; Limberry, 1977; Mladenka 1978; Mladenka and Hill, 1977). Their findings revealed lack of bias in the distribution of public services against low-income residential areas. Such an unexpected evidence, found consistently has led Lineberry (1977) and Mladenka (1978) to question conven-

tional views about municipal decision making for service location and allocation.

Nutley (1979) analysed defferential regional accessibility of secondary schools in the North West Highlands and Islands of Scotland and found out that areas of high population densities and densiest communications network in the study area served as core areas with a high accessibility to secondary school facilities. Away from the core areas is a radial decline towards the perphery, with fingers of relatively higher accessibility along the major routeways to the north, west and south-west. By using relative, integral network accessibility as potential measures he arrived at his conclusions that: secondary schools were concentrated in urban centres and thus urban residents have greater access to secondary school education than rural dwellers and that the correlation between weighted distance and population potential of settlement nodes is as high as $r = 0.94$, which indicates a very favourable level of school accessibility. Size of secondary school was regarded simply as students' enrolment. By relating each of the 365 settlements to the same dominant service centre - Inverness - he calculated relative accessibility score for each of the 365 settlements using

travel time as a measure of distance. The concept of 'accessibility' was interpreted in that study at the regional scale and in aphysical, rather than in a behavioural sense. The cartographic representation of all these measures revealed a large degree of consensus on the spatial patterns of relative advantage in the region. These results demonstrate the extent to which the well-ventilated argument on school concentration, economy and equity has proceeded in practical terms (Nutley, 1979). However, he warned that:"it is very important that regional accessibility is described by a number of different methods, as no single method can adequately represent the various alternative conceptions of the term". However, it may be misleading to use enrolment as an attribute of secondary school services in Oyo State satisfactorily. Enrolment in secondary school was determined by the number of available classrooms, since 100 per cent transition from Primary school to Secondary school level was the planned target of the State goverment. Local government Schools' Boards allocated pupils to schools on the basis of locational principle of maximum of 3-5 kilometres walking distance from pupil's home. That is, to say, enrolments in schools increase with increase in the number of classrooms. Therefore,

classroom as an attribute of size of a secondary school is a better measure of a size of school than enrolment. However, in this study the number of teachers in a school shows the size of the school. This is because teachers were distributed among schools on the basis of number of classrooms, and pupils were distributed to schools on the basis of available classrooms. Therefore, the number of theachers in a school closely reflects the size of the school.

White (1979) stated that the concept of accessibility of service facilities to target populations is an inadequate criterion for public facility location problems, since it overemphasised dispersed facilities as location solutions. Without consideration of interaction and linkages between services in public facility systems the complete range of facility location patterns that can be observed in urban settings cannot be characterised. He concluded that "given empirical evidence and a theoretical basis it is argued that the criterion of facility accessibility should be considered along with a criterion of facility linkage or agglomeration in any comprehensive locational analysis of public facilities" (White, 1979).

Andrew Parking (1982) advanced the thesis that Australian cities generally do not feature large systematic variations in public servicing. Variations can often be attributed broadly to the unintended or unrecognised consequences of service-delivery procedures and the variations tend to be inconsistent between service areas (Parkin, 1982). In essence, Parking suggests that spatial variations in service access and quality are essentially random, with little systematic detrimental consequence. "Large public facilities, such as hospitals, tend to be situated centrally. Police patrols are probably more conspicuous in poorer neighbourhoods" (Parking, 1982).

Adrian (1983) contested Parkin's centralization = equalisation thesis because it ignored the detailed empirical evidence available for such services across a number of Australian cities: the significance of residential differentiation within cities; the complex nature of services variations in service types and quality; and most importantly, the significance and complexity of the spatial dimension in services provision (Adrian, 1983). The conclusion reached is that most urban services in Australia are provided not only unequally but also inequaitably.

Black (1977) in his own study of differential provision of educational resources among and within Australian cities

detected inequality in access to school. Thus in the outer-western suburbs of Sydney journey - to - school distance was long because of the lag in supply of schools- Baddock (1977) found a distinct polarisation of educational achievement levels and participation rates; from low levels in the outer-western and inner-city suburbs to the high levels of the northern and southern suburbs. Not surprisingly Baddock also found that the polarisation of educational attainment and participation rates closely matched the variation in occupational qualification, ethnic status and income. What is perhaps more disturbing is the evidence of a favourable allocation of teaching staff, funds for maintenance of building and equipment and the allocation of teaching materials and special resources to schools in middle-level areas of cities (Stimson, 1982). There was evidence that actions of state education authorities perpetrated educational inequities.

Walker's (1979) study found out that higher socio-economic status had higher concentrations of resident teachers and more favourable school-to-child ratios. It is significant that while Walker found an overall match between educational resources and the distribution of potential demand, there were distinct areas which were

relatively advantaged and disadvantaged educationally.

For these services which are not publicly funded, income differential may have a distinct influence on service usage and availability. In his study of child-care centres in Sydney, Freestone (1977) found that the distribution of service showed little regard for need. However, evidence in the case of hospitals, education, transport and child-care facilities clearly refutes Parkin's 'Centralisation = equalisation thesis of service supply and demand'. "The cumulative weight of evidence across a range of centrally-administered public services, suggests that Australian urban areas exhibit signs of inequality, inequity and inefficiency" (Adrian, 1983).

Gould's (1974) study of school-children and provision of secondary schools in Uganda revealed that there was no discrepancy between the distribution of total population and secondary schools. He noted that: "the distribution of total population in each of the four regions and the national patterns of secondary schools is clearly one of a relatively even spread of schools to the extent that there are no overwhelming regional discrepancies between the two distributions" (Gould, 1974). He also noted that there was urban-rural imbalance in the distribution of

secondary schools in Uganda in 1970 leading to predominant rural-urban flows of pupils. "Secondary Schools are a feature of the urban or district headquarters. This is particularly marked for the largest towns with ten schools in Kampala and seven within five miles of Jinja, and although a disproportionately large percentage of secondary school pupils come from urban areas there is inevitably a large rural-urban component in the movements of secondary school pupils" (Gould, 1974).

In another study, Gould (1972) examined patterns of primary school enrolments in Uganda and found out that enrolment patters varied regionally owing to variations in educational opportunity which were "the product of social and economic forces acting in temporal and spatial dimensions". He wrote: "The desire to educate girls will be less in the poorer areas on account of the greater possibility of stronger traditional values and attitudes towards women, but the demand for girls' education is clearly important in affecting the distribution of opportunity. Differences in the extent of variation in the distribution confirm the role of desire as a spread effect and of demand as a backwash effect" (Gould 1972).

In general Gould observed that variations in school enrolments were largely influenced by social and economic forces, demand and desire factors and missionary educational activities. However, the strength of the missions in affecting the pattern of opportunity has been subject to the constraint of scale of operations within the specific areas. This constraint was partly related to the historical factor of the date of establishing the mission in the area and partly to economic conditions within the area. Missionaries were generally realistic about areas where education and other services could most usefully be provided with successful results - where there was money to pay school fees and where the atttitudes towards education was favourable. The distribution of schools was largely affected by the pattern of demand generated by differences in economic conditions.

Historical factors further operate against promoting regional equality in the early stages of education development. Schools were first established in Uganda in the areas of the first Missionary activity and activity expanded from this focus (Gould, 1972). Gould however failed to establish the precise nature of the apparent relationship between factors such as income, urbanization, economic structure, each with its own areal pattern and

distribution on educational opportunity and enrolment.

Maro and Mlay (1977) also studied the impact of decentralization of power on spatial patterns, efficiency and equitable distributions of public services in Tanzania. In the study they calculated measures of accessibility and relative location for pre-decentralization (1970/71) and post-decentralization (1975/76) by using data on user-distances to public services such as water resources, roads, health facilities, primary schools, markets and shops; and by working out the proportion of the population served by each of the main services. In the study, high levels of accessibility and interaction were regarded as indicators of spatial efficiency and they said: "It may be noted that our measures of spatial efficiency and equity have emphasised the availability, location and distribution of services within districts" (Maro and Mlay, 1977). The study however, revealed that decentralization of power to the people at the Local level and allocation of new facilities on population and their operational efficiency. The study utilized village and district level data to suggest realistic indicators of spatial efficiency and equity.

To conclude that the availability or location of social services in any spatial unit necessarily implies

improved accessibility of the population when there are important non-physical barriers to real access is to miss the discussion at hand. To get into a hospital, for example, and to be treated in both developed and LDCs requires money. "Thus to the poor inhabitant of the inner city (USA) unable to pay or to find the way to financial help through the bureaucratic maze of the "welfare" system, the nearby hospital might just as well be in Uganda in so far as real accessibility is concerned" (Smith, 1977).

Ayeni, Rushton and McNulty (1986) found out that accessibility to health care delivery systems has improved tremendously between 1979 and 1982 in the rural areas of Old Egba Division of Ogun State through the establishment of more health care centres, but the efficiency of location has not correspondingly improved. This is because the existing locations of health care delivery systems are not the best or the optimal that could have been selected to give the same amount of coverage over the distribution of population. The method used was the p-median version of location - allocation model.

Ayeni, Rushton and McNulty (1985) also analysed the efficiency of the location of secondary schools in old Egba Division of the present Ogun State of Nigeria. The study revealed that with increasing number of schools in

the study area there is corresponding decrease in average travel distance and hence travel burden to school. They concluded that increasing the number of schools does not necessarily improve the level of efficiency with which school services are delivered.

Other public facilities of interest which had been investigated in depth in Nigeria are health facilities. The analyses of the system of health resources in Nigeria in terms of availability, spatial distributions, service utilization and optimum location could be found in Adejuyigbe (1971); Okafor (1977); Egunjobi (1977); and Iyun (1978).

In his own study, based on Bendel State of Nigeria, Okafor (1977) analysed the spatial distribution and efficiency of hospital facilities. By using Local government areas (LGAs) as the spatial framework to analyse the distribution of health facilities in Bendel State he found out that there were some discrepancies between the distribution of population and the distribution of hospital facilities. However, even when the creation of an egalitarian society remains a conerstone of national planning, there are glaring inequalities in the distribution of health facilities and services especially between regions or states of the country and also between rural areas (Okafor, 1982). He concluded that factors of total

population or demand, urban population, political patronages, and the distribution of central places could be used to explain and plan the spatial distribution of health facilities in Nigeria. He used methods of correlation and step-wise multiple regression analyses before concluding that "urban population is a far more important factor than total population in explaining the distribution of hospitals, hospital beds and doctors in Bendel State of Nigeria".

Onokerhoraye (1982, 1984) examined the geographical distributions of social services within Ilorin metropolitan area in Nigeria. Using planning standards as a model of analysis he found out that primary and post-primary schools in Ilorin were unevenly distributed in relation to population distribution within the urban space. Consequently, people living in certain parts of the town are quite remote from the existing schools (Onokerhoraye, 1982). In 1984, Onokerhoraye identified factors of inequitable distribution of educational facilities to be related to historical factors of colonianism and capitalism; competition among political parties in Nigeria after 1960; creation of more states in 1967 and 1976; settlement pattern and community development pattern (Onokerhoraye, 1984).

Omoyeni (1982) examined the application of 'school mapping' as a tool for the rationalization of spatial distribution of secondary schools in Ondo State, Nigeria. The study concentrated on the diagnostic analysis of educational supplies in the state with specific reference to Ekiti Central Local Government Area. He examined the missionary educational activities in the state and found out that secondary school resources were spatially concentrated in few urban areas to the neglect of rural areas.

In general various research findings demonstrate that despite Nigeria's social policy of distributive equity, balanced development and equalitarianism the majority of Nigerians have consistently sufferred from unequal access to good education, health, housing, employment, electricity, drinkable water, and so on. It has been observed that the level of accessibility of individuals to these basic needs of life varies considerably from region to region and from place to place. Given this perspective therefore, the extent to which Nigerian's social policy has been faithfully pursued is put into question ... (Oyebanji, 1986).

On the basis of available literature on the problem of accessibility of potential population to the public

facilities and services one can confidently say that access opportunity studies of public facilities were conducted in urban centres of Britain, North America and Australia. The intra-urban patterns of accessibility are fiarly well known for Western Cities although some of the results are somewhat contradictory with regard to the observed well as their interpretations. In the LDCs notably Uganda and Tanzania the impact of 'spatial constraints' on the patterns of social service distributions is less appreciated or studied. In all the studies on public service location in the LDCs cited above, attention was not paid to spatial accessibility model as a method of evaluating systematic, differntial and geographical variations in access across regions, Local Government Areas or settlements. One basic feature of the various studies carried out by development geographers on Nigerian social services is the fact that they deal with Oyo State as a single spatial unit of analysis whereas intra-state or inter-regional and inter-settlement spatial details are needed if a study is to have meaningful relevance for regional planning and development purposes. The analysis of spatial aspects od social services at the regional level provides the touchstone of reality in development studies.

This study provides much of the background information needed for any contribution to social welfare planning it explores the reasons for the widening social facility development gaps between urban and rural areas and among areas within the stae; and attempts to explain the resultant patterns and problems.

This study does not rely on one method but a series of parallel measures were evaluated for the study area to give a comprehensive picture of accessibility to secondary school facilities and services to the population. The application of access opportunity model in evaluating the geographical variations in access to social welfare facilities, for example, secondary schools, has a distinct contribution to make in the field of planning. It is by examining the spatial distribution patterns of social services in space that informed measures could be conceived and applied by governments and planners to counteract whatever undesirable characteristics may emerge. The geographical analysis of educational facilities in a typical region of a LDC will surely increase the understanding and eventual solution of development problems.

Analysis of a component of social welfare services, secondary school education, opens new perspectives on the

nature of regional inequalities in a developing country. The analysis of variations in accessibility to secondary schools in a typical less devdloped country is potentially of great practical value in the context of development planning. The relevance of this study, therefore lies in the application of techniques and models of spatial analysis first evolved in developed countries to the developing world and gives insights into the similarity and dissimilarity of factors that explain the location of social welfare facilities between developed and less developed countries of the world, and thus unravel the complex patterns of continuity and change in a typical less developed country. In these respects the study provides an important and worthwhile contribution towards the wider and deeper understanding of development problems which in the long run contribute positively towards the overall improvement of quality of life in the Third World countries.

2.7 Basic Hypotheses

The following hypotheses will be tested in this study. They are:

1. A change in government educational policy from 'fee paying' to 'free secondary school education'

changes access of citizens to secondary school education across Local government areas and regions in the State, and reduces inequalities in the distribution of schools among Local government areas and between urban and rural regions to the extent that locational efficiency in the patterns of the distribution of schools considerably improves.

2. The distribution of urban centres, urban population, total population, settlements, degree of urbanization, total land area and road density have considerable implication for secondary school locations in Oyo State.

CHAPTER THREE

SPATIAL VARIATIONS IN ACCESSIBILITY TO SECONDARY SCHOOLS

3.1 Introduction

This Chapter describes spatial variations in accessibility to secondary schools in Oyo State before and after 1978. Before 1979 secondary school education was not free and access to it depended on ability to pay. Between 1979 and October 1983 free education scheme was implemented in the State and financial constraints which served as barrier to enrolments was removed. Equality of access to education was ensured as hitherto. Provision of education facilities has been a significant issue in the Old Western Region now Lagos, Ogun, Ondo, Oyo and Bendel States. The overriding goal of education remains the promotion of good quality of life through the promotion of free access to education which minimises social or physical distance to schools. The political party in power (1979-1983) in the State regarded access to education as a right rather than a privilege and it therefore implemented 'free education at all levels' scheme in the State. One expects that all eligible secondary school-age population would be in schools during the free secondary school education period. There is every tendency to expect that the quantitative growth in the

number of secondary schools and the geographical spread of schools in both urban and rural areas would be accompanied by development in education. However, the demand and supply of secondary school education vary among Local government areas of the State owing to variations in socio-cultural and economic circumstances.

The supply of secondary schools is theoretically related to economic consideration, political bargaining, community monetary contributions as well as equity, efficiency and accessibility consideration. On the other hand demand for secondary school education depends essentially on population or need, income, population characteristics (age or sex), settlement patterns, network linkages, occupation and location in space. The factors have strong implications for accessibility, the system of central places and the supply of social facilities. The demand and supply functions for secondary schools are vital elements in any consideration for accessibility. The demand and supply functions of secondary schools vary among Local government areas, between urban and rural areas and between time periods. There are various measures of accessibility and the one used in this work is the access opportunity model developed by Schneider and Symons (1971). The next

section examines patterns of investments in education levels before and during free education periods.

3.2 Resource Allocation To Education In Oyo State

The study area is one of the most educationally advanced in Nigeria as a result of its early exposure to Western education and educational policies in the State since 1955. The educational development of Nigeria since the 1970s is phenomenal. The reasons for the rapid growth of secondary school education resources are traced to:

1. Competition among political parties in the country to legitimatize their positions as provision of social service forms the main issue in the Nigerian political debates;
2. the creation of more states (1967, 1976) which increased the scope for the expansion of social services in all parts of the country; and
3. the availability of improved financial resources to the various governments (Onokerhoraye, 1984).

In Table 3.1 the phenomenal increase in the stock of secondary schools in Nigeria is shown. The total number of secondary schools increased from 2,249 in 1978/79 to 5,642 in 1983/84. This shows an increase of 150.87

percent within a period of five years. In Oyo State the percentage increase in the number of secondary schools was 110.67 percent. The Table also shows that as Secondary Schools were increasing in number in Oyo State other States of the Federation experienced equal increase in the stock of schools hence the percentage decrease of schools from 14.58 to 12.25 (See Table 3.1).

Table 3.1: Growth of Secondary Schools in Nigeria 1978-1983

YEAR	SECONDARY SCHOOLS		
	NIGERIA	OYO STATE	OTHER STATES OF NIGERIA
1978/79	2,249	328	1,921
% Nigeria		14.58	85.42
1981/82	5,067	642	4,425
% Nigeria		12.67	87.33
1983/84	5,642	691	4,951
% Nigeria		12.2	87.75

Source: Statistics of Education in Nigeria, 1980-1984. (Federal Ministry of Education, Statistics Division, Lagos, 1985 Edition).

There are five post-primary education levels such as secondary school, Vocational/Technical Education,

Teacher Training, Colleges of Education and Polytechnic Education. Each of these systems is important as the other but Secondary School education system seems to be highly rated judged by the level of State investments in it. For instance, between 1977/79 and 1984 financial years investments in Secondary School education consistently ranked first among all other systems (See Table 3.2). The Table shows that 52 percent of State government total investments in Post-Primary education was expended on Secondary School education alone during 1977/78 financial year and rose to 88 percent in 1980 and 80 percent in 1984. Investments in Secondary School education was closely followed by Polytechnic education. The percentage investment in Polytechnic education was between 37.34 in 1977/78 and 5.87 in 1980. The differences in resource investments in Post-Primary education is presented in figure 3.1. The figure shows that Secondary education took about 75 percent of public expenditure on post-primary education only to be followed by Polytechnics which took 13.5 percent of the financial outlay in 1983. This analysis of resource investments in post-primary education conceals expenditure per head in Secondary School education relative to other systems. The high investments in post-primary

Table 3.2: Distribution of Recurrent and Capital Expenditures On Some Educational Systems in Oyo State, 1977/78-1984

Financial Year	Secondary Education		Vocational/Technical Education		Teacher Training		College of Education		Polytechnic		Total Expenditure on Post-Primary Education
	₦m.	As % of State Expenses on Education	₦m.	As % of State Expenses on Education.	₦m.	As % of State Expenses on Education	₦m.	As % of State Expenses on Education	₦m	As % of State Expenses on Education	₦m
1. 1977/78	38.502	52.03	-	-	7.869	10.63	-	-	27.629	37.34	74.00
2. 1978/79	45.721	69.35	0.648	0.98	10.643	16.14	-	-	9.917	13.53	65.929
3. Oct-Dec '79	34.476	67.19	1.611	3.14	8.585	16.73	-	-	6.639	12.94	51.312
4. 1980	170.234	88.21	1.946	1.01	7.101	3.78	2.186	1.13	11.319	5.87	192.986
5. 1981	83.174	70.65	1.911	1.62	8.470	7.19	4.368	3.71	19.802	16.82	170.725
6. 1982	104.293	73.46	1.987	1.40	8.549	6.02	5.635	3.97	21.513	15.15	141.975
7. 1983	99.601	75.14	1.804	1.36	5.780	4.36	7.375	5.56	18.00	13.58	132.560
8. 1984	95.755	80.43	1.990	1.67	6.120	5.14	5.336	4.48	9.957	8.28	119.058
Grand Total											895.545

Source: Ministry of Education, Oyo State (Research & Planning Division) Ibadan.

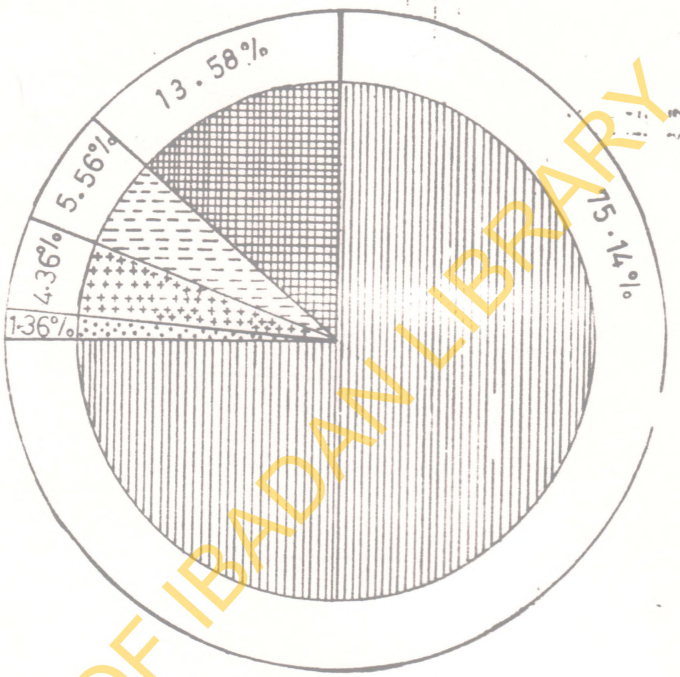


FIG.3.1: Public expenditure on post primary schools education by category in Oyo state, 1983.

LEGEND

- Secondary school education
- Polytechnics
- Colleges of education
- Teacher training
- Vocational/ Technical education

educational systems can be brought into sharp focus if public financial outlays before and during free education period can be compared. For instance, in Table 3.3 expenditure on Secondary School education per month before free education period was ₦7.02m while it was ₦11.52m during free education period.

Table 3.3: Summary Table Showing Expenditure Per Month on Some Post-Primary Educational Systems in Oyo State 1977/78 - 1984

Financial Year	Secondary Edication	Vocational/ Technical Education	Teacher Training	Colleges of Education	Poly-tech-nic
Total Exp. (₦m.) 1977/78 1978/79	84.223	0.648	18.512	-	36.546
Expenditure per month (₦m.)	7.02	0.05	1.54	-	3.05
Total Expen-diture (₦m.) Oct.-Dec. 1979-1984	587.533	11.249	44.804	24.9	87.13
Expenditure per month (₦m.)	11.52	0.22	0.88	0.49	1.71

Source: Computed from Table 3.2

Table 3.4 also shows how expenditure per head increased from 1977/78 financial year to 1984 financial year. Rapid increase in expenditure per head between 1980 and 1984 could be accounted for by free education scheme. Expenditure per head in Secondary education increased from ₦35.00 in 1977/78 through ₦146.00 in 1980 and declined to ₦79.10 in 1983. The above analysis shows that emphasis was placed on Secondary School education relative to other post-primary educational instituttions.

Table 3.4: The Distribution of Expenditure per Head On Secondary School Education in Oyo State 1977/78 - 1984

Year	Total Secondary School-age Population	Total Expendirure on Secondary School (₦)	Expenditure per Head (₦)
1977/78	1,079.195	35,501,520	35.70
1978/79	1,106,516	80,197,110	72.50
1980	1,163,249	170,233,654	146.34
1981	1,192,695	83,174,390	69.70
1982	1,222,890	104,292,770	85.30
1983	1,259,896	99,600,770	79.10
1984	1,277,343	95,754,765	75.00

Source: Ministry of Education (Research and Planning Division) Ibadan.

The analyses of resource investments in education as shown above, indicate increased financial expenditure on education between October, 1979 and October, 1983 as a result of free education policy pursued in the State. Mass provision of secondary schools in the study area entails huge financial outlay.

In Oyo State, as elsewhere in the world, there are both urban and rural regions. Differences between the two regions exist from the perspectives of population characteristics, income level, standard of living and socio-economic infrastructural facilities and services. Table 3.5 shows that secondary school-age population varied from 151,018 in Ibadan Municipal to as low as 26,274 in Oluyole Local government area in 1983. The number of urban centres in 1983 varied among Local government areas as well as total urban population. Since there are significant relationship between total secondary school-age population and number of schools ($r = 0.94$) it is therefore expected to find more schools in areas of high population concentration. For instance, in 1983 about 62 percent of Secondary school-age population were residing in urban areas and they had access to 57 percent of secondary schools in the State. In the same year 38 percent of secondary school-age population

were in the rural areas and they had 42 percent of schools (See Table 3.6).

Table 3.6: Summary Table Showing Variations in Population, and Secondary School Services Between Urban and Rural areas of Oyo State, 1978 & 1983

Areal Unit		Population (Estimate)	Secondary Schools	Enrolment	Teachers
Urban	1978	690.917	166	80,010	3,629
	% State	62.12	70.94	67.76	80.39
	1983	784,549	397	319,776	11,870
	% State	62.27	57.45	69.90	70.29
Rural	1978	472,681	68	38,072	885
	% State	37.88	29.06	32.24	19.61
	1983	475,337	294	137,701	5,017
	% State	37.73	42.55	30.10	29.71

Source: See Table 3.5

The number of secondary schools increased from 234 in 1978/79 to 691 in 1983/84 academic years. Within the same periods the number of teachers also increased from 4,500 to 16,887 or by 275.27 percent. The question that arises is : were there changes in accessibility of the settlements and/or population to secondary schools? In measuring changes in accessibility to Secondary Schools in Oyo State access opportunity model as put forward by

Schneider and Symons (1971) was used.

3.3 A Model for The Evaluation of Changes in Accessibility to Secondary Schools

Following Schneider and Symons (1971), the index of access opportunity (AO) is defined as:

$$AOi = \sum \left(\frac{Sj}{dij} k\right) \quad \text{----- (2)}$$

where

AOi = accessibility in settlement (i)

Sj = number of secondary schools or teachers in facility location point (j)

dij = the physical distance (km) between settlement (i) and facility location point (j) weighted by total population,

k = an exponent describing the frictional effect of distance.

In this study frictional effect parameter of 2.5 was employed as against 1.0 or 1.5 used in developed countries. The high distance decay function of 2.5 is used in recognition of high friction of distance on movement in developing countries. The high friction of distance on movement is caused by inadequate transport services from one settlement and another. For these

reasons distance exponent in LDCs is very high and values between 2.0 and 3.0 are commmonly used. For these reasons too 2.5 which stands in-between the common exponential effect parameters of between 2.0 and 3.0 was employed in this study

$\sum_{j=i}^{n}$ = the summation of term across all settlements from the first facility location point 'j' to the last 'n' within a Local government area. To obtain average access opportunity score for each Local government area, access opportunity indices for all settlements in the Local government area 'i' were summed and then divided by the number of settlements in the Local government area which provides a figure for average access opportunity (Ai) i.e.

$$Ai = \sum\left(\frac{AOi}{S}\right) \text{ ----- (3)}$$

where

AOi = summation of access opportunity for all 'i'(settlements) within a Local government area 'i',

S = summation of all settlements in Local government area 'i',

Ai = average access opportunity index for

Local government area 'i' which range from 0 to 1. Values greater than 1 indicate high accessibility to Secondary Schools; 0.5 to 0.9 indicate moderate accessibility and values below 0.5 indicate poor accessibility.

The calculation of average opportunity scores is influenced strongly by the geometry of the Local government area, settlement pattern and population distribution. The problem of where to put accessibility index within a Local government area arises. It was however assumed that all settlements in each Local government area are evenly distributed and of equal size, so that settlements which are centrally located are more accessible than those in the peripheral areas because centrally located settlements are approximately points of minimum aggregate travel.

However, in the study area, and invariably in the Local government areas, actual geometric centres of Local government areas may have no settlements. The administrative centres of Local government areas were assumed to be more accessible and points of minimum travel than those in perpheral areas. For these reasons, average accessibility score for each Local government area was inserted

in the adminstrative centre rather than the mean or geometric centre of the Local government area.

For the study area two different potential maps were produced . The first map shows spatial variations in average accessibility of settlements in the study area to secondary schools in 1978 and 1983, while the other shows variations in accessibility of settlements to Secondary School teachers in 1978 and 1983.

There are many ways in which distance can be evaluated and one of these is the straight-line physical distance. This study considered only physical distance and ignored transportation costs (time and monetary constraints) on travel. The method assumed, in effect, that a unit of distance is equally important or has equivalent impact on all people. Physical distance measure ignores important social, economic and psychological barriers to service use (Gillespie and Marten, 1978) hence the use of physical distance as a measure of accissibility is problematical. Despite its limitations and its still ambiguous role physical distance measure signifies one of most discussed aspects of accessibility. Moreover it indicates physical availability of services to the population or settlements at large (McLafferty, 1982). In this study accessibility is viewed as proximity of settlements

to the facility or availability of services. The distance separating settlements and facility location points affects the degree of relative accessibility between them.

Another measure of accessibility is gravity measure. The gravity model is probably the most popular. The measure is made by coupling real internode distances on a network with a measure of the opportunity at, or attractiveness of, each other mode of interest. The number of opportunities at one particular node or facility location point discounted or weighted by the distance of the node from some references point (or settlement) is a measure of relative accessibility of opportunities at the destination node (Pirie, 1979).

The results of the analysis are set out in Tables 3.7 and 3.8.

3.4 The Spatial Aspects of Secondary Schools in Oyo State

It has bee stated earlier that before 1978 the provision of secondary schools in Oyo State was the responsibility of both the state government and voluntary agencies such as missionaries, communities and private individuals and organizations. In 1983 private individuals and organizations were not allowed to establish schools

Table 3.7: The allocation of Population to Secondary Schools among L.G.A.s of Oyo State, 978

	L.G.A.	Total Population	Total Popn. Without Sec. Schls.	% Total	Total Weighted distance (Person Km.)	Mean Weighted distance (Person Km.)	Total distance (Km.)	Average distance (Km.)	Maximum distance	Mean access Opportunity
1.	Akinyele	39,324	35,048	89.13	202,867	135244.9	1658	138.17	40	25
2.	Atakumosa	8,202	4,588	55.94	4,351,334	310809.6	1217	89.79	47	4
3.	Ede	63,902	11,416	17.86	15,642,616	1422056	654	93.43	30	2
4.	Ejigbo	23,145	7,049	30.46	350,651	50093	666	98.3	27	2
5.	I.M.G.	136,929	3,656	2.67	51,104	17034	45	15	19	2
6.	Ibarapa	44,924	6,353	14.14	654,185	54515	1582	158.2	45	0.4
7.	Ifedapo	27,779	5,902	21.25	499,463	71351.86	821	273.67	43	1
8.	Ifelodun	44,566	3,745	8.40	425,553	85110.6	455	102.3	25	0.3
9.	Ila	35,324	9,628	27.26	278,355	55671	158	52.67	18	1
10.	Ilesa	38,862	3,637	9.36	20,835	5208.75	23	5.75	14	5
11.	Irepo	34,398	10,099	29.36	860,169	66166.85	1117	85.92	58	0.6
12.	Irepodun	34,437	229	0.66	4,194	1398	75	25	13	0.002
13.	Irewole	38,397	2,969	7.73	500,138	31258.6	2595	162.19	50	0.4
14.	Iseyin	30,260	4,147	13.70	4,587,467	45189	1998	194	58	2
15.	Iwo	42,905	13,887	32.37	562,590	51144.6	917	114.63	29	4
16.	Kajola	24,581	4,011	16.32	252,357	42059.5	534	133.5	42	0.8
17.	Lagelu	12,314	3,597	29.21	87,005	14500.8	207	51.75	18	4
18.	Obokun	24,464	3,857	15.77	718,439	79826.6	2161	240.1	48	6
19.	Odo-Otin	29,185	5,096	17.40	232,660	46532	261	52.2	20	6
20.	Ogbomoso	47,798	3,189	6.67	499,447	38419	2093	261.6	80	0.2
21.	Oluyole	1,903	1,441	75.72	68,662	6242	870	96.67	30	2
22.	Oranmiyan	18,604	5,004	26.90	736,028	52573.4	3043	145.4	50	7
23.	Osogbo	47,695	6,239	13.08	110,170	55085	112	37.3	20	3
24.	Oyo	52,821	3,054	5.78	312,982	20865.5	2456	223.3	54	0.4
	State	942,719	157,837	15.7	3,200,9271	2758356.4	25718	2850.8	878	79.1
	Average	39,279.96	6,576.16	23.63	1,333,719.6	114931.5	1071.6	118.8	36.58	3.3

Source: Computer Output

and hence all secondary schools were government-owned. Community efforts had a strong implication on the patterns of secondary schools in Nigeria as well as in other British ex-colonial territories in Africa. Growth of secondary schools cumulatively occurred in areas of pronounced and active community efforts (usually in the cocoa-belt), while areas of inactive or poor community efforts remained poorly served with secondary schools. The consequences of such conditions is the perpetuation of a dynamic growing area existing side by side with a stagnating one. For these reasons the spatial patterns formed by secondary schools in both 1978 and 1983 significantly differ (19.75 > 2SE), and therefore spatial accessibility of settlements to secondary schools is expected to differ.

The distributions of secondary schools among Local government areas and urban and rural areas are shown in Tables 3.5 and 3.9. Seconddary schools and teachers were not evenly distributed among Local government areas and regions in the State in both 1978 and 1983. Secondary schools varied from 35 in Ibadan Municipal area to as low as 3 in each of Irepo and Irepodun Local government areas in 1978. The increase in the number of schools in 1983,

Table 3.8: The Allocation of Population to Secondary Schools Among L.G.A.s Of Oyo State - 1983

	L.G.A.	Total Population	Total Popn without sec. sch.	% Total	Total weighted distance (Person Km.)	Mean weighted distance (Person Km.)	Total distance (Km.)	Average distance (Km.)	Maximum distance (Km.)	Mean Access Opportunity Score
1.	Akinyele	15084	7759	51.44	905677	75473	1290.5	86.03	36	68
2.	Atakumosa	14466	3034	20.97	165,763	18418	616	68.4	40	8
3.	Ede	43745	4941	11.30	547,745	78249	297	27	26	14
4.	Ejigbo	18826	4677	24.85	447,817	149272	295	44.4	14	12
5.	I.M.G.	151,018	3636	2.42	51,104	17035	15	15	19	7
6.	Ibarapa	25,015	2349	9.39	380,180	38018	1299	108.25	42	1
7.	Ifedapo	32420	1750	5.40	487,397	162466	653	93.29	36	1
8.	Ifelodun	44,209	299	0.68	32,379	10793	307	91	21	1
9.	Ila	33,157	1234	3.72	63,616	21205	124	24.8	14	2
10.	Ilesa	39,916	2015	5.05	11,212	2803	23	5.75	12	7
11.	Irepo	38,979	11445	29.36	988,106	76008	1098	84.46	46	2
12.	Irepodun	48,580	364	0.5	6,501	2167	55	18.33	9	0.1
13.	Irewole	42,034	2011	4.78	467,665	46766.5	2060	206	43	1
14.	Iseyin	8,241	3788	45.97	650,486	54207.2	1998	153.69	51	7
15.	Iwo	26,419	3980	15.06	456,499	57062.4	575	52.27	22	4
16.	Kajola	26,520	811	3.06	108,821	27205	435	72.5	37	1
17.	Lagelu	5,224	1002	19.18	60,358	15089.5	160	26.67	14	4
18.	Obokun	24,597	3354	13.64	1280,649	213441.5	1791	298.5	41	8
19.	Odo-Otin	28,380	2753	9.70	170,678	56892.67	254	84.67	17	6
20.	Ogbomoso	48,787	1712	3.51	463,860	57982.5	2084	160.31	63	0.6
21.	Oluyole	2,222	1219	54.86	113,535	13170.6		46.45	22	6
22.	Oranmiyan	23,252	5057	21.75	1589,205	158920.5	3036	145.43	43	8
23.	Osogbo	9,492	1403	14.79	48,932	16310.67	35	17.5	15	14
24.	Oyo	48,791	1723	3.53	341,178	31043.5	1702	113.5	47	7
	Total State	799,374	72298	9.04	9844,663	1399999.6	19743.5	3044.3	730	189.7
	Average State	33,307.3	4008	15.62	410,194.3	58333.3	822.6	85.2	30.4	7.9

Source Computer Output

Table 3.9 Variations in the Distribution of Secondary School Services Between Urban and Rural Areas of Oyo State by L.G.A. - 1978 and 1983

S/N	L.G.A.	Sec. Schools (Urban)		Sec. Schools (Rural)		Teachers (Urban)		Teachers (Rural)		Enrolments (Urban)		Enrolments (Rural)	
		1978	1983	1978	1983	1978	1983	1978	1983	1978	1983	1978	1983
1.	Akinyele	0	0	6	30	0	0	85	617	0	0	2,267	14,930
2.	Atakumosa	0	0	6	25	0	0	97	451	0	0	2,295	11,589
3.	Ede	6	8	1	7	114	281	11	109	3,098	7,883	157	3,291
4.	Ejigbo	3	6	1	7	65	130	13	121	1,688	3,839	678	4,702
5.	I.M.G	35	120	0	0	971	4,237	0	0	23,164	107,096	0	0
6.	Ibarapa	4	11	3	11	77	246	22	129	2,047	7,371	211	5,485
7.	Ifedapo	2	7	3	11	104	325	14	53	1,475	8,191	1,041	1,425
8.	Ifelodun	7	14	3	8	156	375	58	96	4,987	11,334	1,150	5,238
9.	Ila	4	10	0	3	42	140	0	36	967	6,149	0	1,491
10.	Ilesa	14	21	0	0	320	719	0	0	7,710	16,490	0	0
11.	Irepo	3	8	0	2	47	163	0	16	1,224	4,724	0	655
12.	Irepodun	3	6	0	0	48	164	0	0	1,154	4,423	0	0
13.	Irewole	10	29	0	7	158	614	0	227	4,730	20,796	0	3,687
14	Iseyin	3	9	5	10	86	183	29	223	1,491	5,518	1,199	6,394
15.	Iwo	7	16	2	10	144	475	12	176	3,491	12,209	178	4,454
16.	Kajola	6	11	0	4	49	193	0	74	1,517	6,912	0	2,549
17.	Lagelu	1	1	3	29	14	30	54	459	321	673	1,674	12,018
18.	Obokun	5	8	13	27	83	207	214	716	2,057	5,524	4,924	13,294
19.	Odo-Otin	5	7	3	10	85	173	14	153	4,205	6,603	2,394	3,656
20.	Ogbomoso	10	17	1	22	164	514	21	325	4,109	14,878	173	10,127
21.	Oluyole	0	0	9	23	0	0	164	420	0	0	4,397	10,891
22.	Oranmiyan	20	36	8	35	447	1,106	52	436	11,239	30,177	2,000	16,350
23.	Osogbo	7	22	0	0	178	658	0	0	4,549	15,745	0	0
24.	Oyo	11	30	1	10	277	931	25	180	6,737	23,151	284	6,575
	Total	166	397	68	304	3,029	11,870	885	5,017	91,060	319,776	25,022	137,701

Source: Compiled from records of Ministry of Education (Research and Planning Division) Ibadan

also led to increase in the number of schools in all Local government areas. The spatial distributions of schools in 1983 varied from 120 in Ibadan Municipal to 6 in Irepodun Local government area. The spatial distribution is brought into sharper focus if viewed at North/South and urban/rural levels.

In 1978, 70.94 percent of secondary schools in the State were located in urban areas as against 68 or 29.06 percent in the rural areas of the State. The southern parts of the state are made up of 11 LGAs such as Akinyele, Atakumosa, Ede, Ibadan Municipal, Ilesa and Irewole. Others are Lagelu, Obokun, Oluyole, Oranmiyan and Osogbo. These areas received the attention of the colonial administration by way of roads, schools and other developmental infrastructures because the areas produced palmoil and kernels, rubber and cocoa. In 1978, 145 or 61.97 percent of schools in the State were located in the (cocoa belt)south as against 38 percent in the northern and western savannah areas (Table 3.10).

In 1983 there was redistribution of schools between the regions. The number of schools in urban areas decreased from 70.94 percent in 1978 to 57.45 percent in 1983, whereas the number of schools in the rural areas increased from 68 in 1978 to 294 in 1983.

Table 3.10: Summary Table Showing the Distribution of Secondary Schools between Urban and Rural, North and South of Oyo State

Spatial Units	Year	Secondary Schools	% State +/-	Teachers	% State +/-
LGA	1978	234	-	4,500	-
	1983	691	-	16,887	-
Urban	1978	166	70.94	3,629	80.64
	1983	397	-57.45	11,870	-70.29
Rural	1978	68	29.06	885	19.67
	1983	294	+42.55	5,017	+29.71
South (Cocoa-belt)	1978	145	61.97	2,962	65.82
	1983	428	-61.94	11.188	+66.25
North (Savannah area)	1978	89	38.03	1,538	34.18
	1983	263	-36.06	5,699	-33.75

Source: Computed from data in Table 3.8

In 1978, 145 or 61.97 percent of schools in the State were located in the south and the corresponding number for the northern areas was 89 or 38 percent. The situation did not alter so much in 1983 because 61.94 percent of all secondary schools were located in the cocoa belt and the corresponding figure for the north was 89 or 36 percent. It is clear that some forms of

duality exist in the distributions of secondary schools in the State in the sense that the State can be grouped into a more educationally developed urban or cocoa-belt areas and a less educationally developed rural or northern areas. However, the south/north dichotomies are not necessarily homogenous in so far as there are some developed areas in the north such as in Ibarapa just as there are less developed LGA in the south, for example Lagelu.

Differences in rhe agricultural opportunities, population concentration, distribution or urban centres or settlement characteristics, income and community efforts could be responsible for the differences in the spatial distribution of secondary schools in the two time periods. The woodland savannah of the West and North is made up of thirteen Local government areas whose population and settlements are scattered and proved unattractive to missionaries, private school proprietors and organizations in the colonial days. The relationship between population and schools ($r = 0.94$ at $P = 05$ level) was very strong and significant which shows that population is a strong factor in the distribution of schools. Areas with poor and scattered population concentration, such as the north and west of the study area attract small number of social

services. The distribution of secondary schools showed a strong bias in favour of the cocoa-belt of the south and south-east and the urban centres before and during free education periods in Oyo State.

3.5 Variations In Accessibility To Secondary Schools

Accessibility relates to location both of the supply unit and of the individual settlement, therefore, the distance between them is crucial to the utilization of the services. Variations in the accessibility of settlements to secondary schools existed in 1978 and 1983 and the differences in the accessibility scores among Local government areas were wide (See Table 3.11). Generally speaking, accessibility to secondary schools and staff increased by about 141 and 107 percent in 1983 respectively. The proliferation of secondary schools in 1983 has considerably improved the accessibility of population and/or settlements across the 24 Local government areas. For instance there were 234 schools in the State in 1978 and the number increased to 691 in 1983 or by about 195 percent. The ratio of population to school correspondingly decreased from 4,973 in 1978 to 1,823 in 1983. This rate of decrease is by all standards phenomenal, and constitutes one major reason for an analysis in the study area.

Table 3.19 RATES OF IMPROVEMENT IN ACCESSIBILITY TO SECONDARY SCHOOL FACILITIES AND SERVICES, 1978, 1983

S/N	L.G.A.	Accessibility Score to Secondary School			Accessibility Score to Staff			% increase in the number of Secondary Schools	% increase in the number of Staff	% increase in Enrolment	% increase in the number of facility location points
		1978	1983	% change +/-	1978	1983	% change +/-	(1983)	(1983)	(1983)	(1983)
1.	AKINYELE	25	68	+ 17.2	15	31	+106.67	400	625.88	558.58	220
2.	ATAKUMOSA	4	8	+ 100	6	17	+183.33	316.67	364.95	404.97	180
3.	EDE	2	14	+ 600	6	18	+200	114.29	212	243.39	250
4.	EJIGBO	2	12	+ 500	7	14	+100	225	221.79	321.15	100
5.	IMG	2	7	+ 250	57	68	+ 19.30	242.86	336.35	362.24	0
6.	IBARAPA	0.4	1	+ 150	1	5	+400	214.29	278.79	469.35	80
7.	IFEDAPO	1	1	- 0	1	4	+300	260	263.46	282.19	125
8.	IFELODUN	0.3	1	+ 233.33	27	72	+166.67	120	166.82	216.44	28.57
9.	ILA	1	2	+ 100	6	9	+ 50	333.33	319.05	586.66	150
10.	ILESA	5	7	+ 40	57	61	+ 7.02	50	124.69	113.88	0
11.	IREPO	0.6	2	+ 233.33	1	9	+800	233.33	280.85	339.46	0
12.	IREPODUN	0.002	0.1	+4,900	9	18	+122.22	100	239.58	283.28	0
13.	IREWOLE	0.4	1	+150	3	47	+1,466.67	227.27	432.28	415.50	128.57
14.	ISEYIN	2	7	+ 125	9	12	+ 33.33	137.5	258.26	342.83	20
15.	IWO	4	4	0	3	19	+ 533.33	186.89	352.08	354.16	100
16.	KAJOLA	0.8	1	+ 25	1	4	+ 300	150	337.70	523.67	50
17.	LAGELU	4	4	+ 0	5	8	+ 60	650	745.59	536.14	366.67
18.	OBOKUN	6	8	+ 33.33	13	41	+ 215.38	87.5	148.48	169.56	41.67
19.	ODO-OTIN	6	6	0	61	98	+ 60.66	112.5	229.29	56.83	66.67
20.	OGBOMOSO	0.2	0.6	+200	1	6	+500	254.55	353.51	483.96	75
21.	OLUYOLE	2	6	+200	2	6	+200	155.56	156.10	147.69	100
22.	ORANMIYAN	7	8	+ 14.2	13	40	+207.69	153.57	209.02	251.44	200
23.	OSOGBO	1	14	+366.67	15	18	+1.33	214.29	269.66	246.12	200
24.	OYO	0.4	7	+1,650	2	19	+850	258.33	267.88	323.39	80
	STATE	79	190	+ 140.	321	664	+106.85	195.30	275.27	291.86	100.39

Source: Calculated from Tables 3.7 and 3.8

NOTE: + = Improvement in accessibility
- = Decrease in accessibility

Table 3.12: Measurement of Spatial Accessibility of Settlements to Secondary School Services, 1978 and 1983

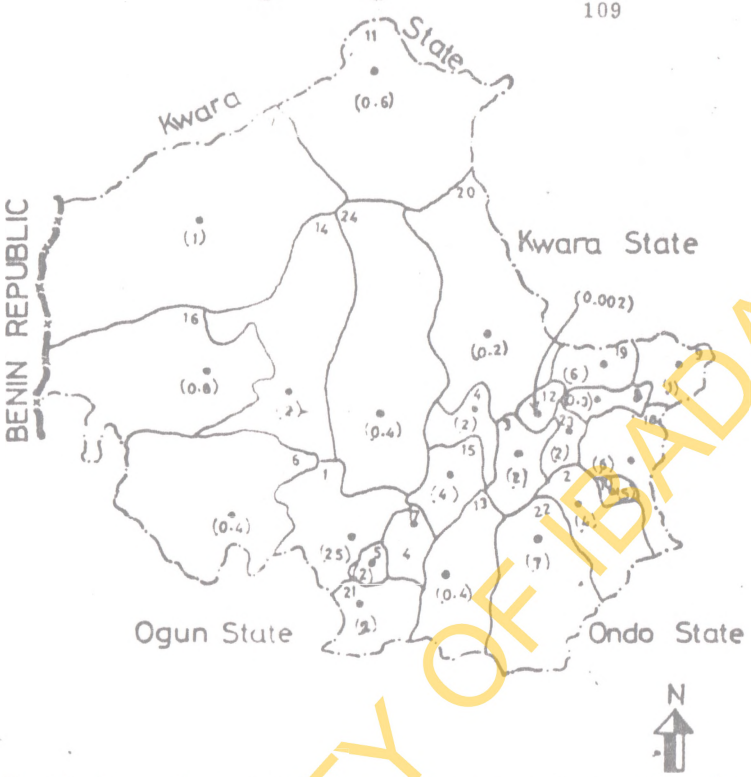
Statistics	1978	1983	% Change +/-
1. Total Population served	1,112,187	1,257,187	+13.28
2. Total Population without Secondary Schools	157,835	72,238	-54.23
3. Population per school	4,973	1,823	-63.34
4. Total weighted distance (person km.)	32,009,271	9,844,663	-69.24
5. Mean weighted distance	2,758,356	1,399,999	-49.25
6. Total distance travelled to School (km)	25,718	19,743.5	-23.23
7. Maximum distance travelled to School (km)	878	730	-16.86
8. Number of Secondary Schools	234	691	+195.30
9. Number of facility location points	101	203	+100.99
10. Total enrolment	116,744	457,477	+291.86
11. Nuber of schools in Urban areas	166	397	+139.16
12. Number of Schools in Rural areas	68	294	+332.35
13. Enrolment in urban centres	80,010	319,776	299.67
14. Enrolment in rural areas	38,072	137,701	+261.69
15. Enrolment per school	499	662	+32.67
16. Mean access opportunity to schools	79	190	+140.51
17. Mean access opportunity to staff	13.38	27.27	+108.80
18. Number of teachers	4,500	16,887	+275.27

Source: Computer Outputs.

Table 3.12 also shows that total population served by secondary schools increased from 1,112,187 in 1978 to 1,25 1,259,883 or by 13.28 percent in 1983. Table 3.12 shows changes in accessibility to secondary schools and teachers between 1978 and 1983. The patterns of accessibility of population in the study area in both 1978 and 1983 are shown in the table. The table shows that total travel burden in 1978 was 32,009,271 person kms. and in 1983 it decreased to 9,844,663 person kms. This shows an improvement in accessibility of 69.24%. Mean weighted distances of 2,758,356 and 1,399,999.6 person kilometres were recorded for 1978 and 1983 respectively. Again, improvement rate in the average weithted distance of 49.25% was rather high. In 1978 total distance travelled by the population in settlements without any one secondary school was 25,718 kilometres and this decreased to 19,743.5 kilometres in 1983. Average distance travelled by population in all the settlements without one secondary school in 1978 was 2,850.8 kilometres and this dropped to 2,044.6 kilomteres in 1983. The decreasing rates of total distance travelled and mean distance travelled were 23.23% and 28.28 respectively (See Table 3.12). Equally, total maximum distance decreased by 16.86% in 1983. The proliferation of secondary school in the study area

consequently led to improved accessibility of settlements to secondary schools by 140.51% in 1983. That is to say, mean access opportunity score has increased from 79 in 1978 to about 190 in 1983.

The pattern of distribution of secondary schools between urban and rural areas changed as a result of increased supply of secondary schools in the state. For instance, the number of schools in urban areas increased by about 139% in 1983, that is, from 166 in 1978 to 397 in 1983. On the other hand, secondary schools in rural areas increased from 68 in 1978 to 284 in 1983 - an increase of 332.35%. Population per school in rural areas decreased from 6,951 in 1978 to 1,668 in 1983; while enrolments in rural areas per school decreased from 560 in 1978 to 483. Generally in the State, enrolments per school increased from 499 in 1978 to 662 in 1983. Put in other way, accessibility to secondary schools in Oyo State and in each of the 24 Local government areas, at urban and rural scales had increased tremendously by 1983. Total population without a secondary school decreased from 157,835 in 1978 to 72,238 in 1983. This is an improvement of 54.23% (See Table 3.12). In 1978, 10.6% of secondary school-age population attended secondary schools but this figure increased to 36.3% in 1983.



NO	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Egbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary

State boundary

L.G. Boundary

L.G. headquarters

Scale: 1:50 000

FIG.3.2: Index of accessibility to secondary schools in Oyo state, 1978.

NOTE: Figures in brackets are accessibility scores.

Figures not in brackets are local government area code numbers.

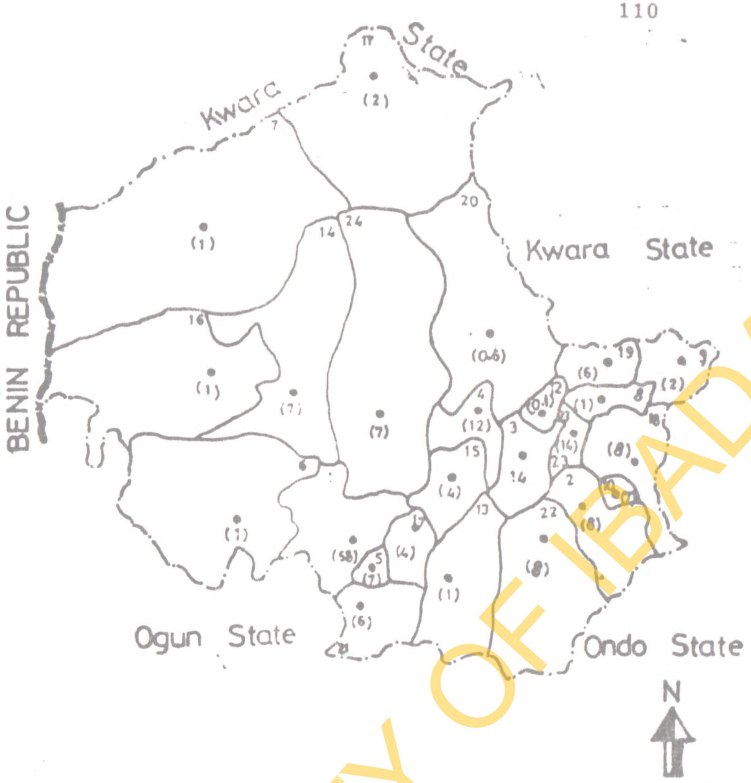


FIG.3.3 Index of accessibility to secondary schools in Oyo state, 1983.

NOTE: Figures in brackets are accessibility scores. Figures not in brackets are local government area code numbers.

No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary

State boundary

L.G. Boundary

• L.G. headquarters

Scale: 1:50,000

Table 3.11 shows that the rates of improvement in accessibility from one Local government area to another. It is obvious from this evaluation that secondary schools were more widely distributed among settlements (towns and villages) in 1983 than in 1978 and therefore more accessible to people in the Local government areas, as well as rural and urban areas of the State. In order to visualize the differential changes in the physical accessibility of secondary schools in both 1978 and 1983, the scores in figures 3.2 and 3.3 are mapped and potential aaccessibility surface are produced (See figures 3.4 and 3.5).

The potential accessibility surface map (See Fig. 3.4) revealed some interesting features. First, accessibility to Secondary School education was generally low in 1978 and accessbility scores were very high in the South and South-East of the study area. Accessibility to schools decreased to the north, west and to the frontiers of the State. Settlements that are located along the boarders of the State suffer educational deprivation. Second, the point of highest accessibility is not the administrative headquarters (Ibadan) but in the north-west of Ibadan. Moniya which lies to the north-west of Ibadan has the highest accessibility scores (25) in 1978 and the

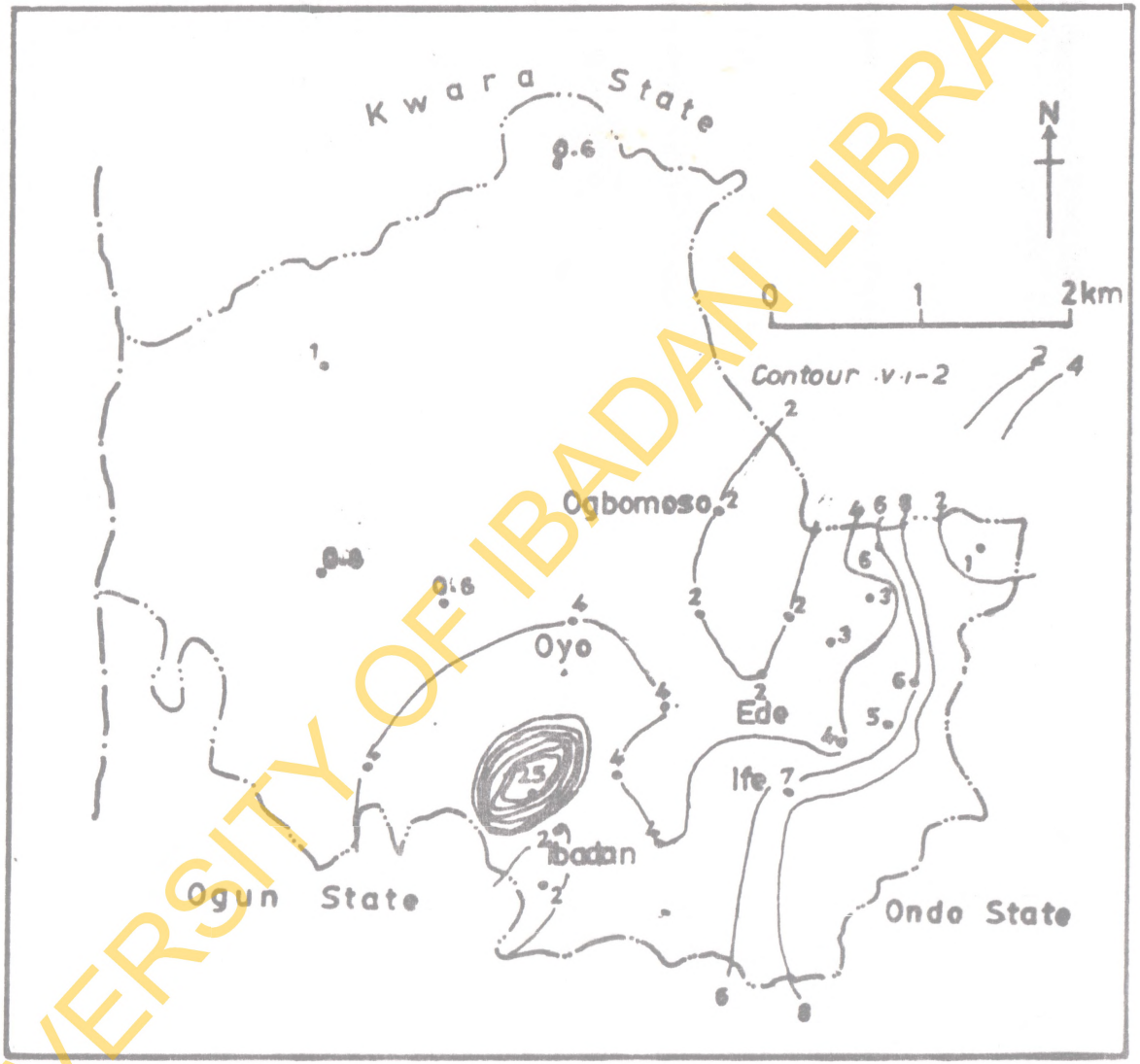


Fig. 3.4 : Potential accessibility surface to secondary schools in Oyo State 1978.

points of lowest accessibility scores are Saki and Ila-Orangun which are over 150 kms away from Ibadan. The area of highest accessibility forms a dome-shaped isolated inselberg which is completely surrounded by lowlands. Third, there is a vast empty space in the west and north of the state that had poor accessibility to secondary education. The implication of this is that people in the north and west covered long distances in order to avail themselves of secondary education. Finally, the map shows that urban centres have favourable advantage to secondary education than the rural villages. Situations somehow changed in 1983 when there was mass provision of secondary schools in the State

Figure 3.5 shows that favourable accessibility remains a common feature of the south and south-east of the study area while the west and north experienced relative under provision of secondary schools. Accessibility to secondary education gradually decreases from the south and south-east on one hand to west and north on the other hand. Areas fronting the neighbourhood states of Ogun, Ondo and Kwara and Benin Republic have very low accessibility scores. Accessibility scores along the boarders of the State are below 3. There is a narrow inlet of low

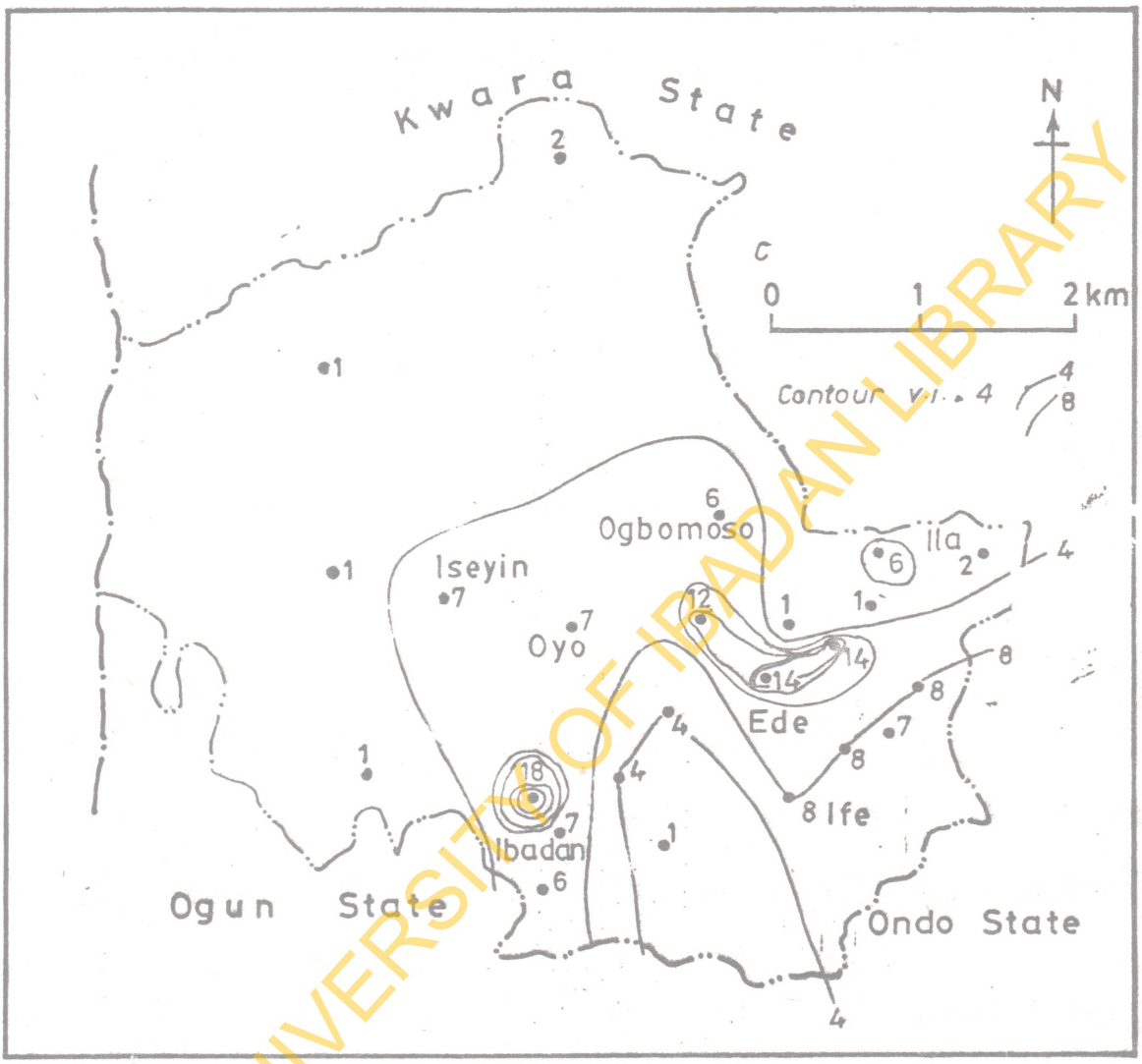


Fig. 3.5: Potential accessibility surface to secondary schools in Oyo State 1983

accessibility score in Irewole LGA which lies to the east of Ibadan. A dome-shaped isolated point of highest accessibility score is still Moniya which lies to the north-west of Ibadan. There is however a long ridge of high accessibility score which embraces Osogbo, Ede and Ejigbo. The ridge lies to the north-east of Ibadan. Another small enclave of high accessibility is Okuku which lies to the west of Ila. Generally, accessibility to secondary education increased in all the LGAs of the State in 1983.

In Oyo State, there were relatively advantaged and disadvantaged LGAs to the extent that people in the 'cocoa-belt travelled shorter distances to avail themselves of secondary education; while the people in the disadvantaged areas of the west and north travelled longer distances to take advantage of secondary school education. There is a visible tendency for accessibility to secondary education to decrease from the 'cocoa-belt of the study area to the West and North (Savannah area). The cocoa-belt region forms the 'core area' of high accessbility while the savannah area of the state forms the 'peripheral region' of low accessibility.

Generally, in the State secondary schools (like any other social welfare facilities) are attracted to areas

of high population concentration found in the 'cocoa-belt' of the state. In 1983, population density of the core area was 65.97 whereas in the peripheral areas of the west and north of the study area, the population density was 24. The corresponding communication densities for the two regions in the same year were 0.17 and 0.05 respectively. Those parts of the study area which have the highest population concentration, settlement nucleation, denssiest communications network form the core of high accessibility to secondary schools.

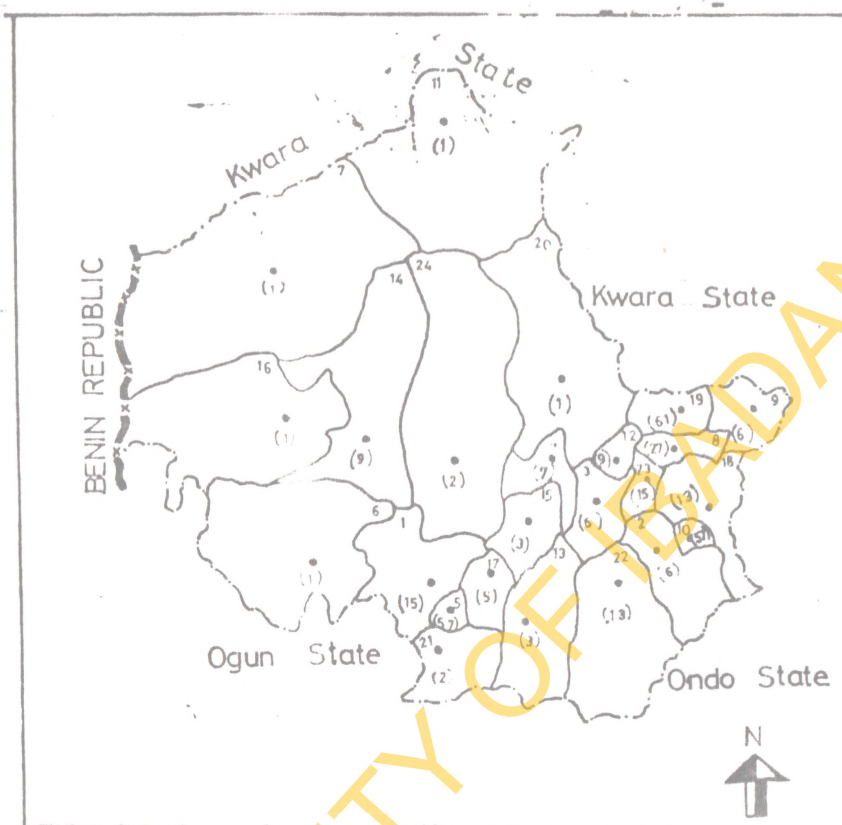
3.6 Variation In Accessibility to Secondary School Teachers

Secondary school teachers were privately recruited by voluntary agencies before 1979 and therefore the number and calibre of secondary school teachers varied tremendously among secondary schools. Between 1979 and 1983 the recruitement of teachers to various secondary schools in the study area became the sole responsibility of the State's Central Schools Board. The Board, up till now, handles the recruitment, promotion, posting and discipline of teachers in secondary schools in the state. The distributional principle for teachers among secondary schools was based on the ratio of one and a half classes to one teacher. The distributional principle notwithstanding,

Table 3.13: Coefficient of Variations in the Distribution of Population and Secondary School facilities among LGAs of Oyo State, 1978, 1983

Statistics and Spatial Units			Mean	Standard Deviation	Coefficient of Variation %
LGA Population	Urban	1978	28.71	27.75	96.68
		1983	32.88	29.67	90.23
	Rural	1978	19.33	14.11	72.96
		1983	19.54	15.38	78.72
LGA: Secondary Schools		1978	9.75	7.53	77.28
		1983	28.79	23.15	80.39
Secondary Schools (Urban)		1978	6.92	7.46	107.86
		1983	1654	23.56	142.43
Rural : Secondary Schools		1978	2.83	3.36	118.67
		1983	12.25	10.57	86.30
Teachers (Urban)		1978	151.21	200.63	132.68
		1983	494.33	832.02	168.31
Rural : Teachers		1978	3.30	4.96	150.29
		1983	209.04	202.18	96.72
Accessibility (Secondary Schools)		1978	3.30	4.96	150.29
		1983	7.90	13.18	166.77
Accessibility (Teachers)		1978	13.38	18.05	134.94
		1983	27.67	25.01	90.40

Source: Computed from Tables 3.5, 3.7, and 3.8



No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Ivo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary

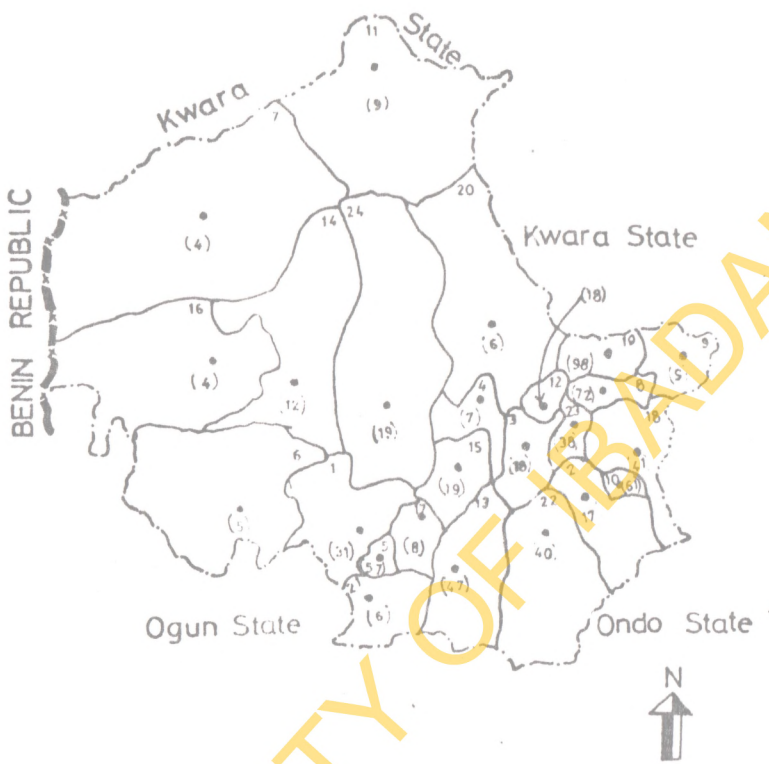
State boundary

L G Boundary

• L. G. headquarters

FIG.3.6: Index of accessibility to secondary school teachers, 1978.

NOTE: Figures in brackets are accessibility scores. Figures not in brackets are local goverment area code numbers.



No	G A
1	[illegible]ayele
2	[illegible]kunmosa
3	Ede
4	Ejigbo
5	I. M. G.
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary

State boundary

L G Boundary

L G headquarters

Scale: 1:50,000

FIG.3.7: Index of accessibility to secondary school teachers, 1983.

NOTE: Figures in brackets are accessibility scores.

Figures not in brackets are local government area code numbers

some school principals often obtaine more than their prorportional shares of teachers in the State. The extent of accessibility variations of secondary schools and/or student population to teaching staff is examined in this section.

In Table 3.11 it was shown that accessibility to secondary school teachers in 1983 improved in all the LGAs. Mean accessibility to secondary school teachers improved from 13.38 in 1978 to 27.67 in 1983 - an improvement of 106.80 percent (See Table 3.12). However, there are variations in the improvement rates among LGAs. Table 3.13 shows differences in the coefficients of variations in the accessibility scores. Coefficients of variation to secondary school teachers were 134.94 (1978) and 90.40 percent in 1983 implying greater spread of scores among LGAs in 1978 than in 1983.

Figures 3.6 and 3.7 show variations in accessibility scores to secondary school teaching staff in 1978 and 1983 respectively and the contour maps showing the variations among LGAs in form of potential surfaces are shown in Figures 3.8 and 3.9. Generally speaking, accessibility to secondary school teachers in 1978 was higher in the 'core area' formed by the cocoa-belt and dips gradually to the 'peripheral region' formed by the savannah area

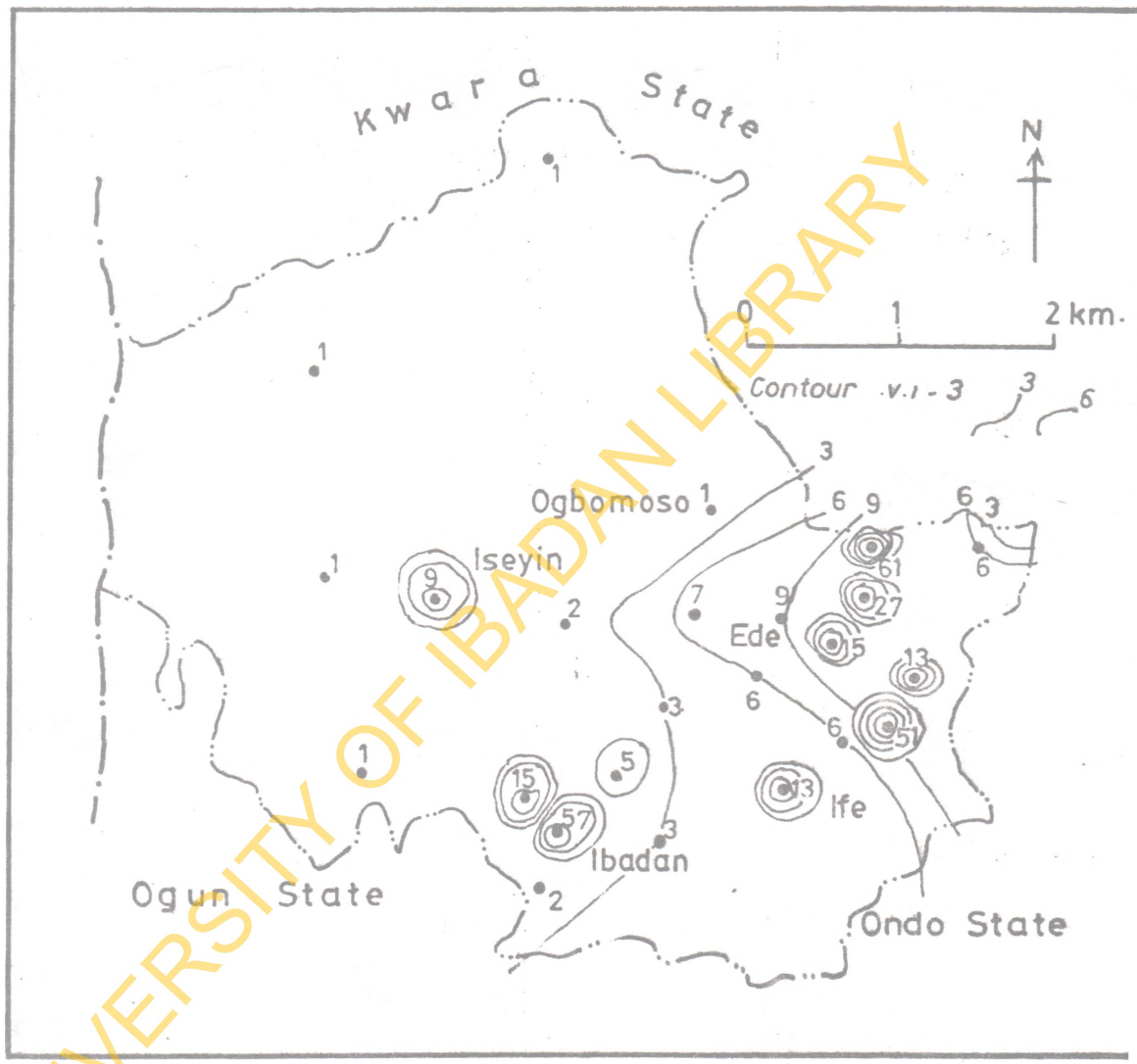


Fig.3.8 Potential accessibility surface to secondary school teachers in Oyo State 1978.

of the west and north. Along the boarders of the state are areas of low isopleths implying poor accessibility to secondary school teachers. The point of highest accessibility is at Okuku (61) which lies to the north-east of Ibadan. Another striking feature of the map is that there are numerous isolated inselbergs of high accessibility which are surrounded by area of low accessibility. Isolated dome shaped hills of high accissibility are associated with urban centres. Generally speaking urban centres of the sout and south-east have relatively high accessibility to secondary school teachers. In 1978, Secondary school teachers were spatially concentratated in few urban centres of the study area at the expense of rural areas.

The relatively low isopleths around Ibadan can be explained by the dominating role of Ibadan over the surrouding areas before the split of Ibadan into four LGAs in 1976. Before, there was backwash effect of Ibadan on the neighbouring towns and settlements and services such as schools, health services, roads and so on. Another reason is that Akinyele, Oluyole and Lagelu had no urban centres which could attract social services. Settlements in the three LGAs are scattered and of small sizes and therefore adequate threshold population which could justify the provision of secondary schools could not be obtained. Teachers throughout the world and especially in the

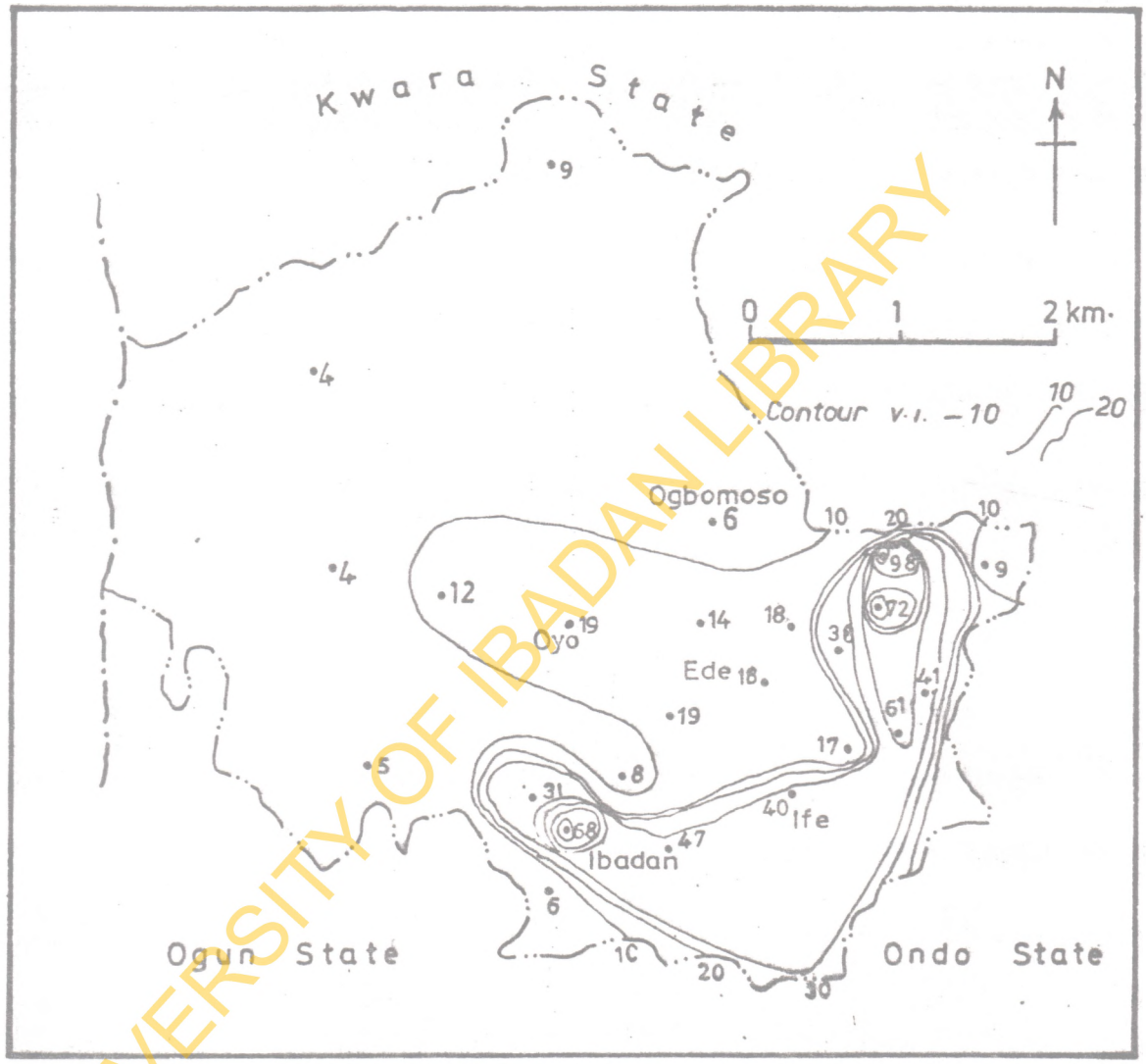


Fig. 3.9: Potential accessibility surface to secodary school teachers in Oyo State, 1983

developing countries of the world, prefer to work in urban centres where there is abundant supply of social services. There is a wide gulf of los accessibility south of Ife. The dome-shaped isolated hill of high accessibility at Ife stands in the inlet which embrace the whole of Irewole, Oluyole and Iwo LGAs. Fronting the state boarders in the West and North are vast areas of very poor accessibility to teachers.

In 1983, there was tremenfous improvement in the accessibility of the population to secondary school teachers (See Figures 3.7 and 3.9). Accessibility scores to secon-day school teachers were very high in Okuku and Ibadan. There is a ridge of high accessibility which starts from Moniya and embraces Ibadan, Ife and Ikirun and terminates at at Okuku in the north-west of Ibadan. The ridge dips to Ede and Oyo but slopes sharply to the south and south-east. There is a vast empty space of low isopleths in the west and the north of the study area implying that people in these areas travel long distances to avail themselves of teaching services.

The cartographic representations of accessibility to secondary schools and teachers show spatial patterns of relative advantage and deprivation in the state. That part of the study area which has the greateest population concentration, settlement nucleation, densiest communica-tions network and high missionary activities, as repre-

sented by the cocoa-belt, forms the 'core area' of high accessibility to both secondary schools and teaching personnel.

Based on their accessibility to schools and teachers the 24 Local government areas of the study area were classified. The next section examines the classifications of Local government areas (1978 and 1983) which are based on their accessibility scores to secondary schools and teaching staff. Disadvantaged and advantaged Local government areas in respect of schools and teachers are easily identified.

3.7 Classification Of Local Government Areas According to their Accessibility Scores to Secondary Schools

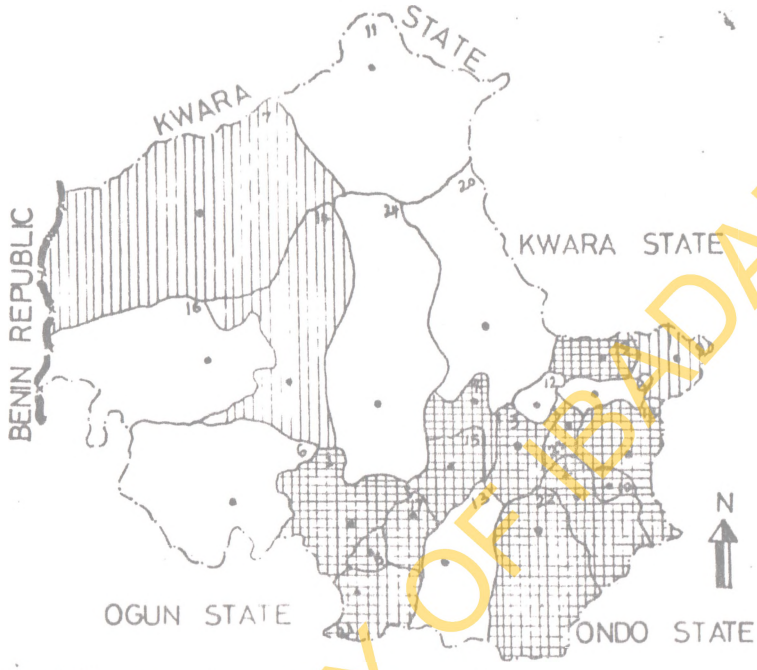
Classification in geography is of two types: by logically subdividing a population or by agglomerating like individuals. In logical subdivision the subdivision procedure is accomplished in a series of steps using carefully defined criteria. The agglomeration method takes a number of individuals and assembles them into classes according to some grouping procedure. Classification is based on two, three or more variables to define taxonomic spaces of two, three or more dimensions. The data gathered for this study do not permit the use of multifactor classification technique but logical subdivision. Whatever

the approach adopted in any geographic classification of areal units based on their attributes, some types of regions can be identified. Two of the regions are: (1) contiguous and (2) the uniform region. A contiguous region is a relatively homogenous area unit defined by specific criteria which contains no enclaves or other regions and no outliers of others except those of the same type. It is completely surrounded by the territory of others (Johnston, 1970). This term applies to both formal and functional regions. On the other hand uniform regions are a set of relatively homogenous area units based on specific criteria which are not necessarily conguous (Johnston, 1970).

Data (gathered on Local government area basis) on secondary schools and teachers are each arranged in a descending order. The means and their standard deviations are each computed. Both nested means and standard deviation from the means techniques are used; but nested means method seems to be approriate for the data at hand and more realistic and exhaustive. By scaling the scores three classes of Local government areas emerge, thus: High accessibility have more than 1.00; moderate accessibility areas have between 0.5 to 1.00, and low accessibility areas have below 0.5 accessibility scores. Every Local government area fits

into one of the classes. This logical subdivision of secondary schools enables a stepwise division of Local government areas of the study area into a hierarchy of classes. Based on the accessibility scores to secondary schools and teachers in 1978 and 1983 classes of Local government areas are identified. By classifying Local government areas according to whether they are above or below the State average details are eliminated and patterns emerge. The results are shown in Figures 3.10, 3.11, 3.12, and 3.13. In classifying Local government areas according to their accessibility scores to schools non-hierarchical grouping method was used while hierarchical grouping technique of classification was employed in the classification of Local government areas accoring to their accessibility to secondary school teachers. This is because grouping technique increases level of generalisation.

In 1978, accessibility to secondary schools was poor generally in the state with 3.3 as the stat average. Local government areas of high and moderate accessibility scores were regarded as being developed educationally while those with below 0.5 accessibility scores were poorly developed educationally. This method enables us to see how the Local government areas divide along educationally developed/non-developed lines.



No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Egbo
5	I M G
6	Ibarapa
7	Iledapo
8	Ifelodun
9	Ifa
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary
State boundary
LGA boundary
L G Headquarters

Scale: 1: 50,000

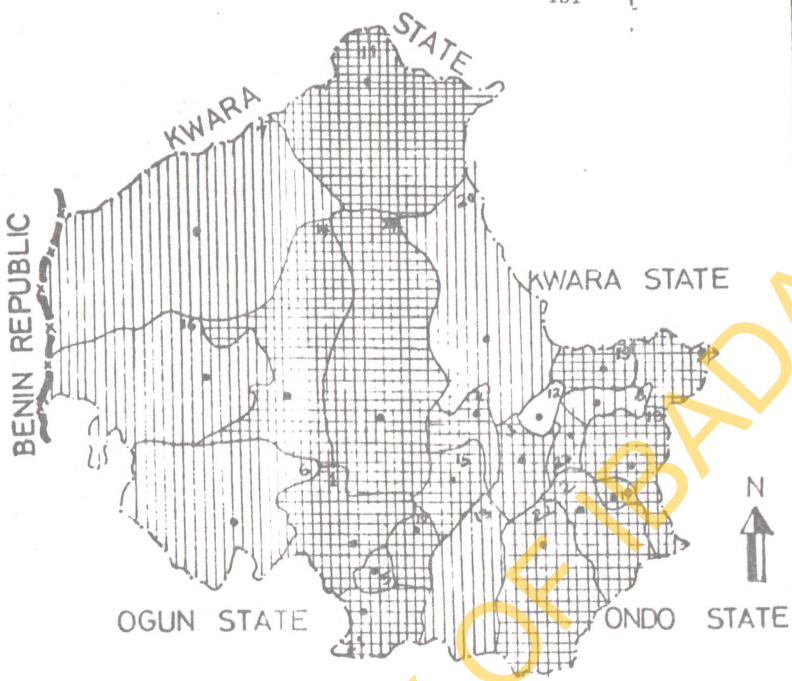
FIG. 3.10: Classification of LGAs of Oyo state according to their accessibility scores to secondary schools, 1978.

KEY
High accessibility
Moderate accessibility
Poor accessibility

As mentioned earlier there are two contrasting areas in Oyo State: the cocoa-belt of the south and south-east and the woodland savannah of the west and the north. The former comprises eleven Local government areas with relatively affluent population growing industrial crops such as cocoa, oil palm, kolanuts and coffee; while the latter is made up of thirteen Local government areas that are relatively poor growing food crops. Figure 3.10 shows that thirteen Local government areas were highly served with secondary schools, three were fairly served while eight were poorly served. All the eleven Local government areas of the cocoa-belt were highly developed educationslly except Irewole. The poor development of Secondary schools in Irewole Local government area could be accounted for perhaps by poor geographical spread of urban centres, the impact of 'Reserved Forest' which left a vast area of the Local government area unsettled and the domination of the area by muslim religion which, in the early period of colonisation in Nigeria, discouraged western education. Three Local government areas were fairly developed educationally. They include Ila, Iseyin and Ifedapo all of which are found in the woodland savannah of the west and the north. From Figures 3.11, it is clear that some forms of duality

exist in the development of secondary school education in Oyo State in the sense that the State can be grouped into a more developed south and south-east (cocoa-belt) and a less developed west and north (the woodland savannah). However these two dichotomies are not necessarily homogenous in so far as there are some educationally developed areas in the north such Ifedapo, Iseyin, Odo-Otin and Ejigbo just as there is less educationally developed Local government area in the south, for example Irewole.

In 1983 accessibility of population in the two contrasing regions improved tremendously owing to proliferation of secondary schools in the State. Figure 3.11 shows that educationally developed Local government areas have increased from sixteen in 1978 to twenty-three in 1983. The only disadvantaged Local government area was Irepodun. The most developed Local government areas increased from thirteen in 1978 to sixteen in 1983, while moderately developed ones increased from three in 1978 to six in 1983, and the poorly developed Local government areas decreased from eight in 1978 to one in 1983. The forms of duality in the educational development that existed in 1978 vanished in 1983 with mass provision of schools in the State. The poor development of secondary



No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

FIG.3.11. Classification of L G As of Oyo state according to their accessibility scores to secondary schools, 1983.

KEY
- High accessibility
- Moderate accessibility
- Poor accessibility

- International Boundary
- State boundary
- L G A boundary
- L G Headquarters

Scale: 1:50,000

schools in Irepodun Local government area could be due to poor development of settlements (the Local government is made up of three urban centres that are very close to each other), few settlements and perhaps the backwash effects of Osogbo on the Local government area and constant social and political misunderstanding among the people of the three urban centres (Erin, Ifon and Ilobu). The mass provision of schools in the State in 1983 and the free education policy of the State government has removed unequaldevelopment of secondary school education.

Physical inaccessibility of, and unavailability in settlements or Local government areas, secondary schools is only one aspect of educational deprivation in the State. Another aspect of ecuational deprivation is seen in the quality of educational services provided in respect of teaching staff. A community may possess secondary schools but may be deprived of trained and adequate teaching staff.

As mentioned earlier secondary school teachers were recruited by Oyo State Central Schools' Board in 1983 and before 1978 voluntary agencies recruited teachers. Based on these different approaches there could be differences in the number and quality of teachers in secondary schools. Some schools in certain Local government areas were deprived of adequate teaching staff in both 1978 and 1983.

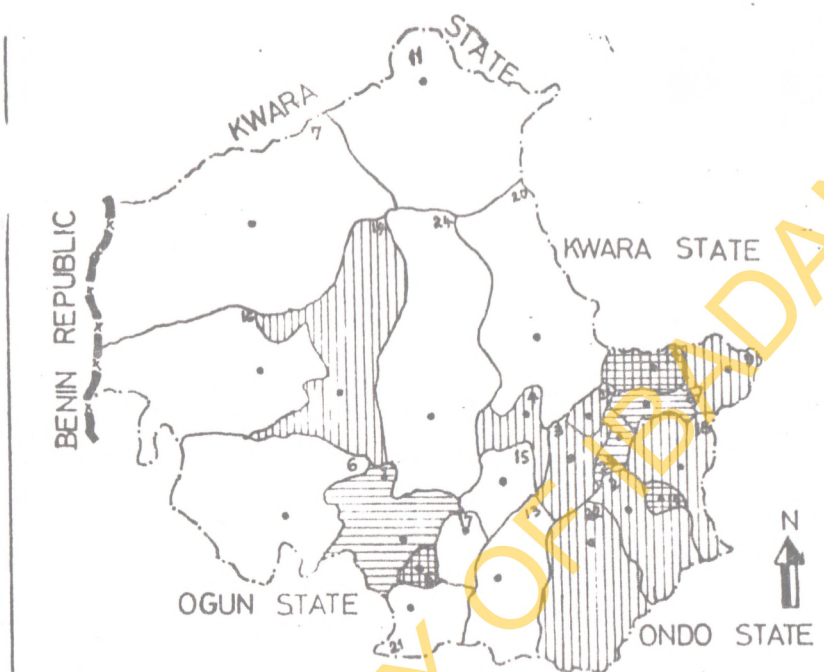


FIG.3.12: Classification of LGAs of Oyo state according to their accessibility scores to teachers, 1978.

KEY
- Very high accessibility
- High accessibility
- Moderate accessibility
- Low accessibility

No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwa
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

- International Boundary
- State boundary
- L G A boundary
- • L G Headquarters

Scale: 1: 50,000

Knowledge of the deprived areas could be useful to guide planners in their distributional effors in order to reduce inequalities in the allocation of teachers among Local government areas of Oyo State.

Figures 3.12 and 3.13 show differences in the distribution of teachers in 1978 and 1983 among Local government areas respectively. In Figure 3.12 it was shown that these Local government areas such as Ibadan Municipal, Ilesha and Odo-Otin were highly served with teachers. Although Ifelodun Local government area was inadequately provided with schools (see Fig. 3.10) yet it was adequately provided with teaching staff in 1978. Ifelodun Local government area could be attractive to teachers because it has many urban centres which are provided with modern amenities and the inter-state road which links Osogbo with Ilorin passes through the Local government area. The second class of high accessibility comprises three local government areas. The three Local government areas, include Akinyele, Ifelodun and Osogbo. Local government areas that were fairly served with teachers include Iseyin, Ejigbo, Ede, Irepodun and Atakumosa. Others include Oranmiyan, Obokun and Ila.

Another striking feature of the map is that Local government areas that are located along the State frontiers

suffer deprivation in respect of teaching staff. In 1978, ten Local government areas were denied access to teaching staff and out of which three of them: Oluyole, Irewole and Lagelu were from the cocoa-belt of the south. Most of the worst served Local government areas in both 1978 and 1983 have peripheral locations along the State boundaries with Benin Republic and the neighbouring States of Ogun, Ondo and Kwara .

In Figure 3.13, number of Local government areas with favourable access to sedondary school teachers increased from four in 1978 to ten in 1983. Out of the eight disadvantaged Local government areas in 1983 only Lagelu had interior location. Nine Local government areas were highly advantaged while Iseyin, Oyo, Ejigbo, Iwo, Atakumosa and Irepodun were fairly advantaged. The poor accessibility of Lagelu and Oluyole could be accounted for by the poor development or lack of urban centres which consequently led to inadequate provision of social infra-structures. In both 1978 and 1983 the 'cocoa-belt' was advantaged in respect of schools and teachers while the woodland savannah areas of the State were disadvantaged.

In both 1978 and 1983 the cocoa-belt of the south and south-east controlled about 62 percent of secondary schools in the State leaving 38 percent of schools to be

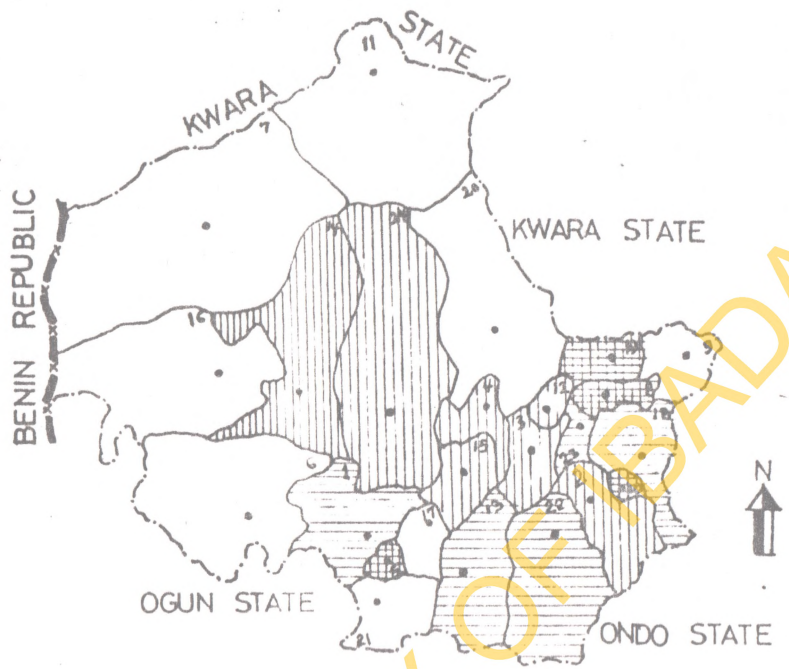


FIG. 3.13 Classification of LGAs of Oyo state according to their accessibility scores to teachers, 1983.

KEY
- Very high accessibility
- High accessibility
- Moderate accessibility
- Low accessibility

No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

- International Boundary
- State boundary
- L G A boundary
- L G Headquarters

Scale : 1:50,000

controlled by the thirteen Local government areas of the north and west. Teaching staff were unequally distributed between the woodland savannah and forest areas of the study area. In both 1978 and 1983 not less than 66 percent of secondary school teachers were located in the cocoa-belt of the south and south-east of Oyo State. The unequal distribution of population between cocoa-belt and savannah areas was reflected in the distribution of secondary schools and teachers in both 1978 and 1983 in the sense that the cocoa-belt controlled roughly 52 percent of the population of the study area and had access to about 66 percent schools or teachers in each of 1978 and 1983. However, there could be other reasons for spatial concentration of schools and teachers in the south and south-east of the study area.

The conclusions that can be drawn from the above analyses are: One, settlements that are far removed from the administrative centre of each Local government area have less accessibility advantage to secondary schools and teachers in the State; two, Local government areas that are far away from State headquarters and/or located along the state boundaries tend to suffer educational deprivation; three, in remote settlements, geographic isolation combined with indadequate threshold population and lack of community

efforts results in educational deprivation, spatial imbalalnces and territorial injustices in the allocation of secondary schools and teachers in the State. The next Chapter focuses attention on the level of inequalities in the allocation of secondary schools and teachers among Local government areas of Oyo State.

CHAPTER FOUR

INEQUALITIES IN THE DISTRIBUTION OF SECONDARY SCHOOL FACILITIES IN OYO STATE

4.1 Introduction

In the last chapter, it was revealed that accessibility to secondary schools facilities and services has improved over the years. With increasing number of schools in the state, between 1979 and 1983, there is corresponding decrease in the average travel distance and hence travel burden. For instance, the mean access opportunity to schools increased fron 3.3 in 1978 to 7.9 in 1983; while mean access opportunity to staff improved by 108% within the same period and the mean weighted population decreased from 2,758 person kilometres in 1978 to 1,399,999 person kilometres in 1983. The number of secondary schools in the state increased from 234 in 1978 to 691 in 1983. It is obvious however that increasing the number of schools does not necessarily improve the level of equitable allocation of schools among Local government areas and between urban and rural areas of the study area. This chapter examines the degree to which secondary schools were distributed in relation to population or need among Local government areas and between urban and rural areas of the study area.

The allocation of social services is often designed to give most to those in most need. The spatial distribution of secondary schools relative to the distribution of population, represents the basis for the definition of equity in this thesis in terms of the presence or absence of the facilities. It is therefore pertinent to find out whether or not the State government policy on education has led to a more equitable distribution of secondary schools.

The main thrust of this chapter, therefore, is to evaluate and describe the degrees of equality and equity in the allocation of secondary school facilitites and services among Local government areas and between urban and rural areas of the study area. In this respect it becomes relatively easier to compare Local government areas and regions in their relative advantage or disadvantage with respect to secondary schools facilities and services. Two null hypotheses are formulated for the issues considered. They are:

(i) The availability of secondary schools among Local government areas of Oyo State does not vary with the need of population served.

(ii) Inequalities in the distribution of secondary schools do not exist among Local

government areas and between urban and rural areas of Oyo State.

4.2 A Model for the Analysis of Equity in Service Distribution

Gini coefficient, Lorenz curves and ratio of advantage or disadvantage are some of the methods employed for measuring inequality and inequity in the distribution of wervices. Gini coefficient is a single measure of the extent to which a facility is concentrated arealy by comparison with some other distribution i.e. the percentage distribution of population between Local government areas of Oyo State. The G-coefficient is defined as follows:

$$G = \frac{1}{2} (X_1 - Y_1) \quad - - - (4)$$

where

X_1 = the proportion of secondary schools or teachers in Oyo State located within Local government area 'i';

Y_1 = the proportion of total secondary school-age population in Oyo State located within Local government area 'i'; (i.e. the index of need);

G = Gini coefficient.

In this study the G-index ranges from 0 to 100; the larger the G-value the more inequality is in the distribution

of secondary schools. The Gini coefficient and Lorenz curve are helpful devices for the evaluation of territorial distribution on the basis of equality. But they do have technical and conceptual limitations. One, is that data on ratio scale are required to calculate the percentage frequencies. Two, distributions with the same G-value can have somewhat different curves (Atkinson, 1970; 1975). Three, both Lorenz curve and Gini coefficient are sensitive to the level of territorial aggregation. Thus, what is unequal at one spatial scale may appear much more equal at another (Smith, 1877).

The Lorenz curve represents a graphical illustration of spatial inequality in the distribution of secondary school facilities in Oyo State. An important step in the production of the graphs is the computation of the ratios of advantage for the 24 Local government areas. The ratio of advantage was derived by dividing the respective share of a Local government facility by its share of secondary school-age population:

$$Rj = Sj \div Sj^* \quad - - - (5)$$

Where Rj is ratio of advantage in Local government areas; Sj is the proportional share of secondary school facility (secondary schools, or teachers) in LGAs; and Sj* is the

proportion of secondary school-age population. Although the ratios are essentially used for ranking the Local government areas (most advantaged to most disadvantaged) yet they contain some important information on the distribution pattern of facility in relation to need. A ratio of advantage of 1 indicates allocation of facility in relation to secondary school-age population; and ratios of advantage of below 1 and above 1 show relative under-provision and over-provision respectively.

The above stated methods were used in this thesis to analyse the degree of inequality and inequity in the allocation of secondary school facilities and services among Local government areas, urban and rural areas of the study area.

Another model of evaluating distributional equity and equality is the maximal or the set covering problem of location - allocation analysis (Morrill and Earickson, 1969). The maximal covering problem determines the location of say K facilities such that a specified maximum number of the population is covered by these facilities within a given distance standard. In this regard, distributional equity is seen as involving the imposition of some minimum standard with which patterns of location may be evaluated.

This model is not employed in the evaluation of secondary school services in the study area for some obvious reasons:

(1) not all settlements that utilize the facilities appear on the base map and as such distance separating the facility location point and settlement cannot be adequately measured;

(2) most of the settlement that appear on the map do not appear in the 1963 population census list and as such their population projections cannot be reliably made, and

(3) both the number of Local government areas and locations of secondary are so many that the time and resources at the disposal of the researcher could not cope with the problems.

4.3 The Distributions of Secondary School Facilities: An Explanation

Before 1978 the distribution of secondary schools had no laid down distributional principles and as such market forces played a dominant role in the allocation of secondary schools. The distributional principles that under-scored the allocation of secondary school services between 1979

and 1983 were that:

(1) Schools are to be allocated on the basis of geographical spread and even distribution;

(2) Schools are to be located on the basis of threshold population or need;

(3) In locating schools pupils are not to walk more than 3-5 kilometres away from their homes;

(4) Teachers are to be distributed among schools on the ratio of one teacher to one and half classrooms; and

(5) Pupils are to attend schools within their Local government area.

The question of spatial equity of access opportunity requires that the distribution of education services be related to the population that provides potential users. In this thesis spatial equity is defined as a distribution of resources to each area according to the needs of the population of that area. An inequitable distribution of schools will have a low or negative correlation with population (Tario, 1980). In other words, the most appropriate distribution between areas is to each according to the needs of the population of that area. Table 4.1

shows relationship between population and secondary school services.

Table 4.1: Correlation results: Population of LGA and Secondary School Services: Enrolments in Local government area and Distribution of Teachers

Product Moment Correlation		R	R^2	t-value
1. Population and Secondary Schools	1978	0.93	0.8649	11.86*
	1983	0.94	0.8836	12.93*
2. Enrolments and Teachers	1978	0.99	0.9801	32.89*
	1983	0.60	0.36	3.51*

* Significant at 0.05 level.

Table 4.1 shows that there are strong and significant relationship between schools and population among Local government areas of Oyo State in both 1978 and 1983. The population growth was accompanied by increase in the number of secondary schools in the State. There is need, however, for proper planning in the distribution of schools in the State in order to derive maximum efficiency in the allocation of schools in terms of quality of education that would be received. In 1978 there was strong and

significant relationship between enrolments in schools and number of teachers. In 1983 there was significant association between the number of teachers and enrolements. In 1978 the distribution of teachers among LGAs was determined by enrolment. The mass provision of schools in Oyo State (1979 - 1983) has led to growth of schools but no development. An important observation with regard to Table 4.1 has to do with the distributional criteria discussed earlier on. The correlation coefficient (r=0.60) shows that in 1983 enrolment was not an important distributional criterion of secondary school teachers in spite of stated policy objectives. By implication, distribution of teachers in 1983 was not necessarily related to need. The growth of schools was not correspondingly matched with the provision of teachers.

4.4 Inequality In The Distribution of Secondary School Facilities Among Local Government Areas of Oyo State 1978, 1983.

(i) Inequality Among Local Government Areas

Spatial variations in secondary schools entails spatial variations in accessibility of populations to the services provided. In chapter three it was observed that the spatial patterns formed by sedondary schools in both 1978 and 1983 showed spatial concentration in urban centres

Table 4.2: Variations in the Coefficient of Variations in the Distribution of Population and Secondary School facilities among LGAs of Oyo State, 1978, 1983.

Statistics and Spatial Units			Mean	Standard Deviation	Coefficient of Variation %
LGA Population	Urban	1978	27.75	27.75	96.68
		1983	29.67	29.67	90.23
	Rural	1978	19.33	14.11	72.96
		1983	19.54	15.38	78.72
LGA: Secondary Schools		1978	9.75	7.53	77.28
		1983	28.79	23.15	80.29
LGA: Teachers		1978	187.50	194.81	103.00
		1983	703.63	800.11	113.71
Secondary Schools (Urban)		1978	6.92	7.46	107.86
		1983	16.54	23.56	142.43
Secondary Schools (Rural)		1978	2.83	3.36	118.67
		1983	12.25	10.57	86.30
Teachers (Urban)		1978	151.21	200.63	132.68
		1983	494.33	832.02	168.31
Teachers (Rural)		1978	36.88	53.58	145.29
		1983	209.04	202.18	96.72
Accessibility (Secondary Schools)		1978	3.30	4.96	150.36
		1983	7.90	13.18	166.77
Accessibility (Teachers)		1978	13.38	18.05	134.94
		1983	27.67	25.01	90.40

Source: Computed from Tables 3.5 and 3.9.

as against rural areas. In both 1978 and 1983, roughly 71 and 58 percent of sedondary schools in the State were located in various urban centres respectively. The corresonding figures for rural areas were 29 and 42 percent. Variations in the distribution of Secondary Schools and teachers in both 1978 and 1983 and at urban and rural scales were revealed in Table 4.2 by their coefficients of variation. The Table shows that secondary schools were more dispersed among Local government areas of Oyo State in 1983 (cv = 80 percent) than in 1978 (cv = 77 percent). Secondary schools were more dispersed among urban centres in 1983 (cv = 42 percent) than in 1978 (cv = 142 percent)than in 1978 (cv = 108 percent). In the rural areas secondary schools were more concentrated in few settlements in 1983 (cv = 86 percent) than in 1978 (cv = 119 percent). Teachers were unequally distributed among Local government areas of Oyo State in both 1978 and 1983 (cv = 114 percent) than in 1978 (cv = 104 percent). Variations in the distribution of population among Local government areas of Oyo State is often accompanied by variations in the availability of social welfare facilities such as schools, hospitals and so on.

The root of inequality in the number of secondary schools among Local government areas of Oyo State may

Table 4.3: Percentage Variations in the Distribution of population, Secondary School Services Among L.G.A.s Urban and Rural Areas of Oyo State

	L.G.A.	State						Urban						Rural					
		Sec. School Age Popn.		Sec. School		Teachers		Sec. School Age Popn.		Sec. Schools		Teachers		Sec. Schls. Age Popn.		Sec. Schls.		Teachers	
		1978	1983	1978	1983	1978	1983	1978	1983	1978	1983	1978	1983	1978	1983	1978	1983	978	1983
1.	Akinyele	3.55	3.55	2.56	4.31	1.89	3.86	-	-	-	-	-	-	8.33	3.42	8.82	10.20	9.80	12.30
2.	Atakumosa	2.64	2.65	2.56	3.62	2.18	2.67	-	-	-	-	-	-	8.22	7.01	8.82	8.50	10.96	8.99
3.	Ede	3.49	3.96	2.99	2.17	2.78	2.31	4.14	4.20	3.61	2.02	3.14	2.37	2.16	2.31	1.47	2.38	1.24	2.17
4.	Ejigbo	2.14	2.15	1.71	1.88	1.73	1.49	1.43	1.42	1.81	1.51	1.79	1.40	2.96	3.34	1.47	2.38	1.47	2.41
5.	I.M.G.	11.99	11.99	14.96	17.33	21.58	25.08	19.29	19.25	21.08	30.23	26.76	35.70	0	0	0	0	0	0
6.	Ibarapa	2.23	2.23	2.99	3.15	2.20	2.22	2.45	2.44	2.41	2.77	2.12	2.07	1.68	1.89	4.41	3.24	2.49	2.57
7.	Ifedapo	2.67	2.67	2.14	2.69	2.31	2.24	2.35	2.34	1.20	1.76	2.87	2.74	2.86	3.21	4.41	3.24	1.58	1.08
8.	Ifelodun	4.04	4.04	4.27	3.16	4.76	3.38	5.23	5.25	4.22	3.53	4.30	3.16	1.87	2.05	4.41	2.72	6.55	1.91
9.	Ila	3.11	3.11	1.28	1.88	0.93	1.04	4.27	4.26	2.41	2.52	1.16	1.18	1.07	1.30	0	1.02	0	0.72
10.	Ilesa	3.17	3.17	5.98	3.03	7.11	4.26	5.10	5.09	8.43	5.29	8.82	6.06	0	0	0	0	0	0
11.	Ireno	3.04	3.04	1.28	1.45	1.04	1.06	3.52	3.51	1.81	2.02	1.30	1.37	2.00	2.38	0	0.68	0	0.32
12.	Irepodun	2.99	2.99	1.28	0.87	1.07	0.97	4.81	4.80	1.81	1.51	1.32	1.38	0	0	0	0	0	0
13.	Irewole	5.19	5.19	4.70	5.21	3.51	4.98	5.03	5.02	6.02	7.30	4.35	5.17	4.86	5.48	0	2.38	0	4.52
14.	Iseyin	3.14	3.15	3.42	2.75	2.55	2.44	2.93	2.92	1.81	2.27	2.17	1.54	3.11	3.51	7.35	3.40	3.28	4.44
15.	Iwo	6.43	6.44	3.85	3.76	4.20	3.86	6.11	7.24	4.22	4.03	3.97	4.00	6.20	5.11	2.94	3.40	1.36	3.51
16.	Kajola	2.18	2.18	2.56	2.17	1.36	1.58	2.50	2.49	3.61	2.77	1.35	1.63	1.17	1.66	0	1.36	0	1.47
17.	Lagelu	4.19	4.19	1.71	4.34	1.51	3.40	0.95	0.95	0.60	0.25	0.39	0.25	8.46	9.54	4.41	9.86	6.10	9.15
18.	Obokun	3.39	3.39	7.69	5.07	6.60	4.37	1.08	1.49	3.01	2.02	2.29	1.74	6.39	6.52	19.12	9.18	24.18	14.27
19.	Odo-Otin	3.39	3.39	3.42	2.46	2.20	1.93	3.75	3.74	3.01	1.76	2.34	1.46	2.51	2.83	4.41	3.40	1.58	3.05
20.	Ogbomoso	6.44	6.56	4.70	5.64	4.11	4.97	11.81	5.83	6.02	4.28	4.52	4.33	8.77	7.75	1.47	7.48	2.37	6.48
21.	Oluyole	2.08	2.09	3.85	3.13	3.64	2.49	0	0	0	0	0	0	1.91	5.53	13.24	7.82	18.53	8.37
22.	Oramiyan	7.20	7.20	11.99	10.27	11.09	9.61	4.51	4.50	12.05	9.07	12.12	9.12	10.36	11.66	11.76	11.90	5.88	8.69
23.	Osogbo	4.81	4.81	2.99	3.18	3.96	3.90	3.23	7.72	4.22	5.54	4.30	5.54	6.09	0	0	0	0	0
24.	Oyo	5.89	5.89	5.13	6.22	6.71	6.58	5.55	5.54	6.63	7.56	7.63	7.84	5.71	6.47	1.47	4.42	2.82	3.59
	State							62.12	62.27	70.94	57.45	80.64	70.29	37.86	37.71	29.06	42.55	19.67	29.71

Source Computed from Table 3.5

probably be associated with the factors of colonianism and capitalism, differences in agricultural opportunities and community development efforts, settlement and population characteristics, and so on. These differences are manifested in the quantity of educational institutions available in each Local government area, as well as urban and rural areas. Table 4.3 shows the percentage disrtibution of State's Secondary schools among Local government areas. In 1978 the Local government shares of the total secondary schools in the State varied from 14.96 percent in Ibadan Municipal through 5.98 percent in Ilesha to as low as 1.28 percent in each of Ila and Irepodun Local government areas of the State.

The unequal distribution of secondary schools among Local government areas of Oyo State is confirmed by the Lorenz curves in Figure 4.1. In the figure, the inequalities in both 1978 and 1983 are shown by the gaps between 45° diagonal plot and the Lorenz curves. Schools were more spread among Local government areas in 1983 than in 1978. The pattern of inequality in the distribution of secondary schools in 1978 (See Tables 3.5 and 4.2) was conspicuous to the extent that 5 or 21 percent of the 24 Local government areas controlled 107 or 46 percent secondary schools in the State. The redistributive

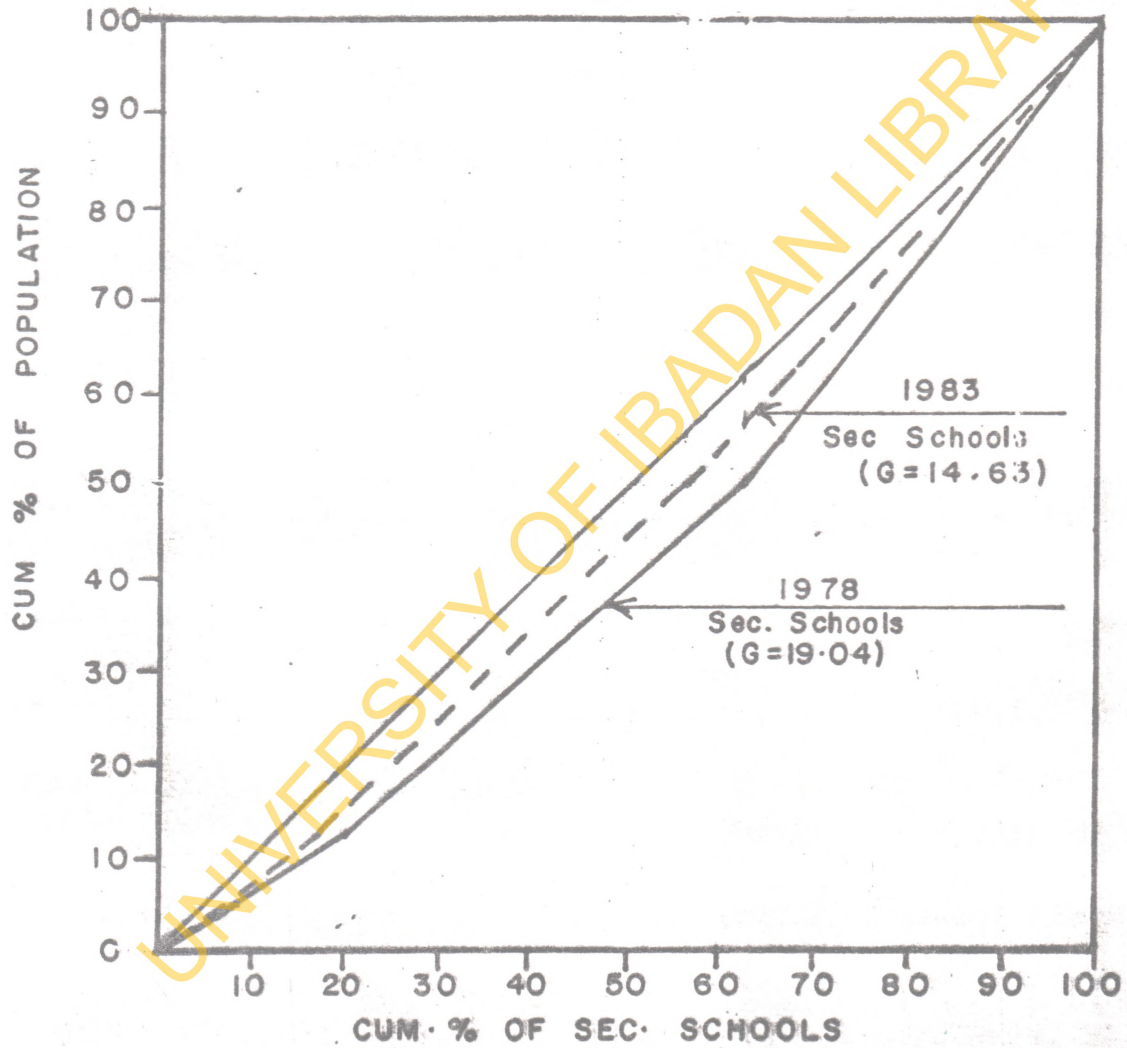


Fig 4.1 : Lorenz curves showing the distribution of Sec. Schools among LGAs of Oyo State, 1978 and 1983.

tendency of mass provision of secondary schools in the State in 1983 is seen in the fact that the same proportion of secondary schools was controlled by seven Local government areas in 1983. Inequality in the allocation of schools among Local government areas was more pronounced in 1978 than in 1983. In 1978 Ibadan Municipal, Ilesa, Irewole, Obokun, Ogbomoso, Oranmiyan and Oyo controlled 63.68 percent of all secondary schools in the State and in 1983 the same number of Local governments controlled 37.19 percent of all secondary schools in the State. The inequality was obvious in 1978.

Teachers were distributed in relation to enrolement in each school and enrolment are determined by the size of the school measured by number of classrooms. There were 4,500 and 16,887 teachers in Oyo State in 1978 and 1983 respe ly and these were variably located among Local government areas, and between urban and rural areas of the State on the basis of laid down criteria, however dedined. The distribution of Secondary school teachers ranged between 21.58 percent of teachers in the State in Ibadan Municipal to as low as 0.93 percent in Ila Local government area in 1978. Generally speaking, there was increase in the shares of teachers in the State in all the Local government areas in 1983. The LGAs' share ranged from 25 in Ibadan Municipal.

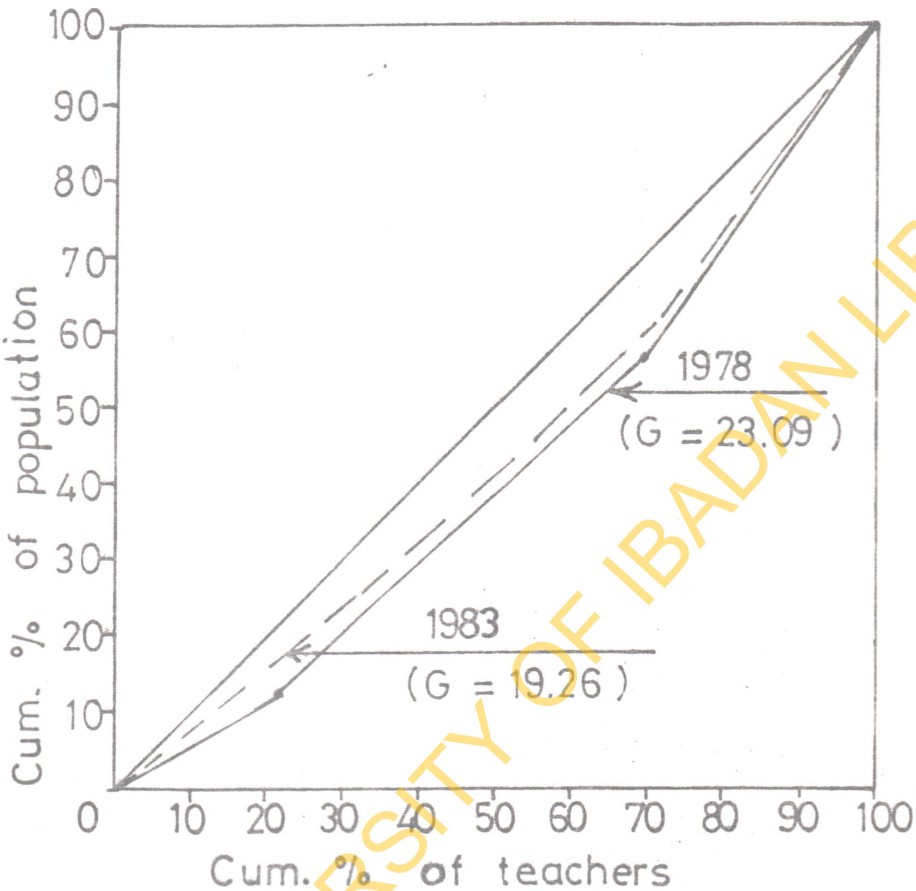


FIG. 4.2: Lorenz curves showing distributions of secondary school teachers among L G As of Oyo state, 1978 and 1983.

through 0.97 percent in Irepodun Local government area. The inequality in the allocation of teachers among Local government areas was confirmed in Figure 4.2 by the gaps between Lorenz curves and 45° diagonal plot. Secondary school teachers were more unequally distributed among Local goverment areas in 1978 than in 1983. The analysis show that both secondary schools and school teachers were more equally distributed among Local government areas of Oyo State in in 1983 than in 1978. People are aware of what they see, therefore, educational awareness and participation would be more pronounced among people in the Local government areas in 1983 than in 1978. Deffere-nces in the distribution of secondary school resources may vary between urban and rural areas of the State. The next section examines this problem.

(ii) Inequality in the Distribution of Secondary Schools and Teachers Between Urban and Rural Areas of Oyo State

At both urban and rural scales, secondary schools and teachers were unequally allocated. In 1978, 166 or 70.94 percent of all secondary schools in Oyo State were located in urban centres and by 1983 the value decreased to 57 percent (See Table 4.3). Since degree of urbanization varied among Local government areas in the State so also

the proportion of secondary schools in urban centres in each of the 24 Local government areas varied in 1978 and 1983. The proportion of secondary schools in urban centres varied from 21 percent in Ibadan Municipal area to as low as 0.60 percent in Lagelu Local government area in 1978; while in 1983 it varied from 30 percent in Ibadan Municipal area to 0.25 percent in Lagelu Local government area. The coefficients of variations of secondary schools in urban centres in 1978 and 1983 were 108 and 142 percent respectively meaning wider spread of secondary schools among urban centres in 1983 than in 1978. The proportion of State's secondary schools in the rural areas in 1978 was 29 percent but increased to 43 percent in 1983. In 1978 the number of State's secondary schools in the rural areas varied from 19 percent in Obokun to 1.47 percent in each of Ede and Ejigbo Local government areas ot the State. In 1983, the number of Secondary schools in the rural areas ranged between 35 or 12 percent in Oranmiyan Local Local government area to as low as 2 or 0.68 percent in Irepo Local government area of Oyo State (See Table 4.3). The coefficients of variation in the distribution of secondary schools among rural areas of Oyo State in 1978 and 1983 were 119 and 86 percent respectively implying wider spread of schools among the rural settlements of

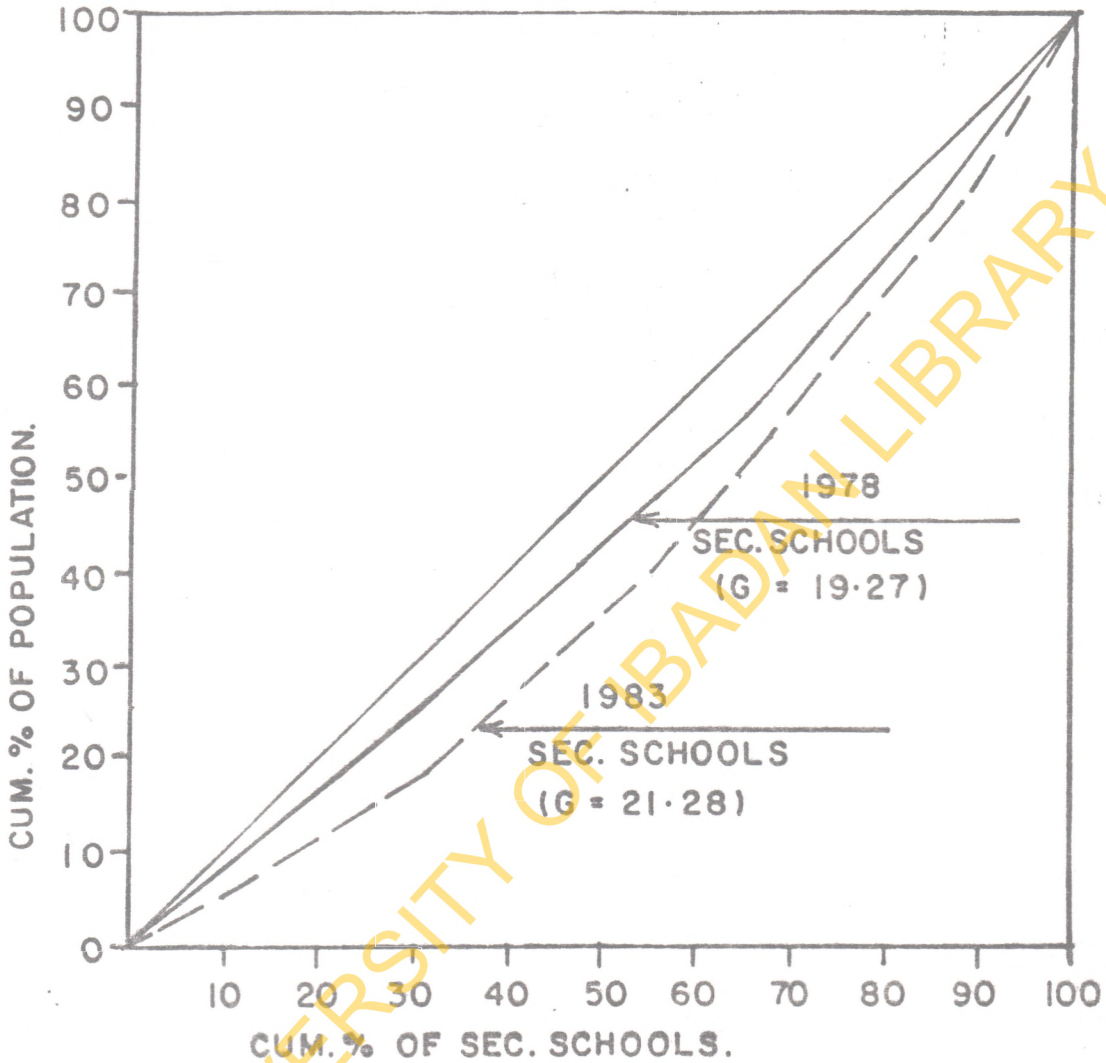


Fig. 4·3: Lorenz curves showing the distributions of Secondary schools among Urban populations in Oyo State, 1978 & 1983.

settlements of Oyo State in 1978 than in 1983. Figure 4.3 shows the graphical distribution of schools among urban areas in 1978 and 1983. The gaps between Lorenz curves and 45° diagonal line confirm the notion that secondary schools were more spread among urban centres in 1983 than in 1978.

In both developed and Third World countries teachers prefer to stay and work in urban centres that have social amenities as against the rural areas which lack 'good things of life'. In 1978, 81 percent of teachers in the State were located in various urban centres and this figure decreased to 70 percent in 1983. The highest proportion (27%) of secondary school teachers in urban centres in the State was found in Ibadan Municipal while the lowest (0.39% was found in Lagelu Local government area in 1978. In 1983 the share of Ibadan Municipal (36%) continued to increase while the share of Lagelu)0.25%) decreased by 36 percent (See Table 4.3). Table 4.2 shows that secondary school teachers were more widely spread among urban centres in 1983 (cv = 168 percent) than in 1978 (cv = 133 percent). In 1978 and 1983 about 20 and 30 percent of the State's secondary school teachers were located in the rural areas respectively. The proportion of teachers in Oblokun Local government area (24 percent

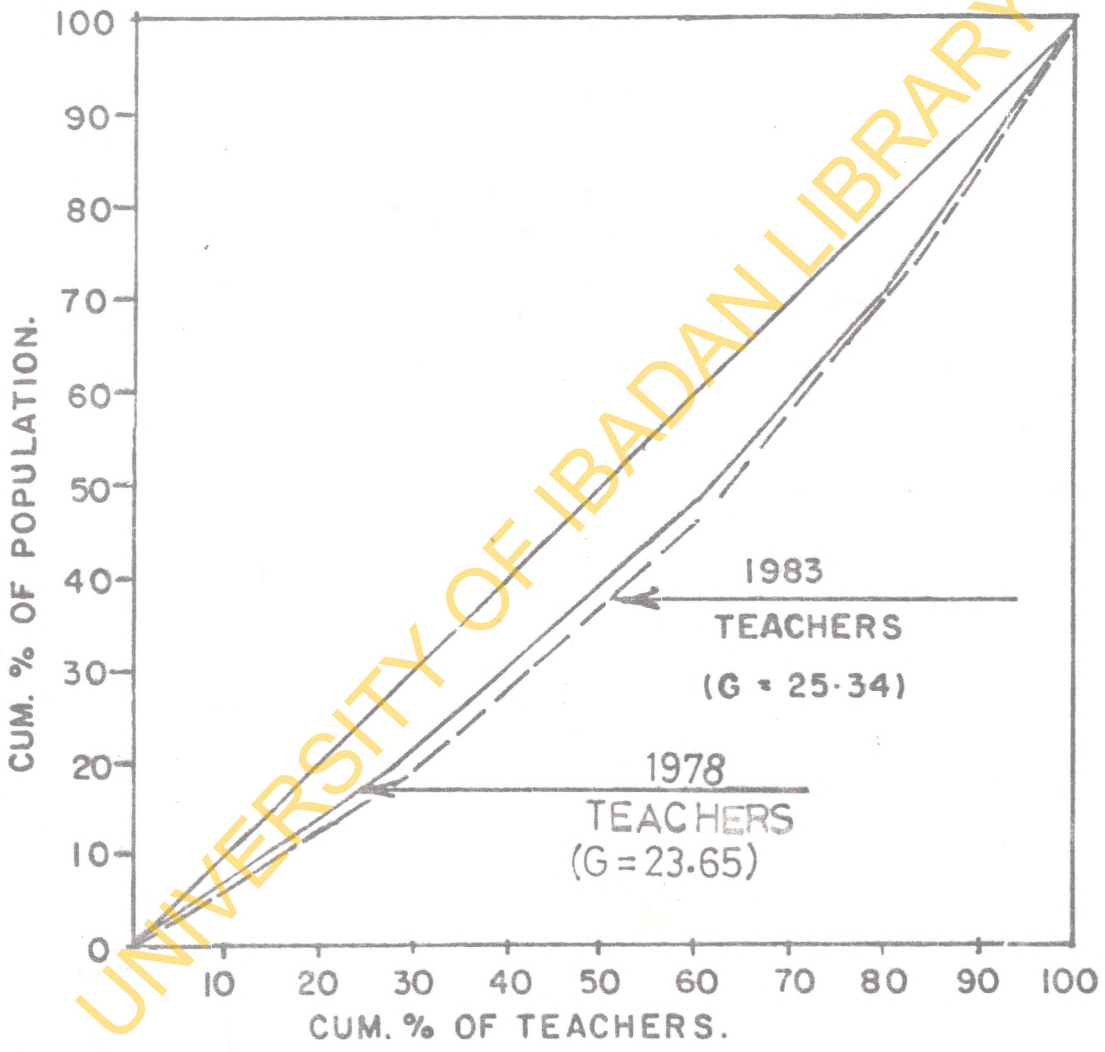


Fig.4·4: Lorenz curves showing the distribution of teachers among Urban areas of Oyo State, 1978 & 1983.

of teachers in the rural areas of the State) was the highest while Iwo recorded the lowest figure (See Table 4.3). In 1983, the proportions of teachers in the rural areas varied from 14 percent in Obokun, through 8.69 percent in Oranmiyan to as low as 1.06 percent in Ifedapo Local government areas (See Table 4.3). The Local government area with highest proportion of its population in the rural area did not necessarily control the highest share of both secondary schools and teachers in either 1978 or 1983. For instance in 1983 Akinyele Local government area had 9 percent of its population in the rural areas but cntrolled 10 and 12 percent of State's secondary schools and teachers respectively. On the other hand Obokun Local government area had about 7 percent of its population in its rural areas but controlled 9 and 14 percent of State's secondary schools and teachers respectively in 1983. This implies that Local government areas with nucleated rural settlements and densiest communications network are more attractive to social welfare facilities than Local govern ment areas with dispersed settlements and poor communications network.

Figures 4.4, 4.5 and 4.6 show that secondary schools and teachers were unequally distributed among Local government areas of Oyo State in 1978 and 1983.

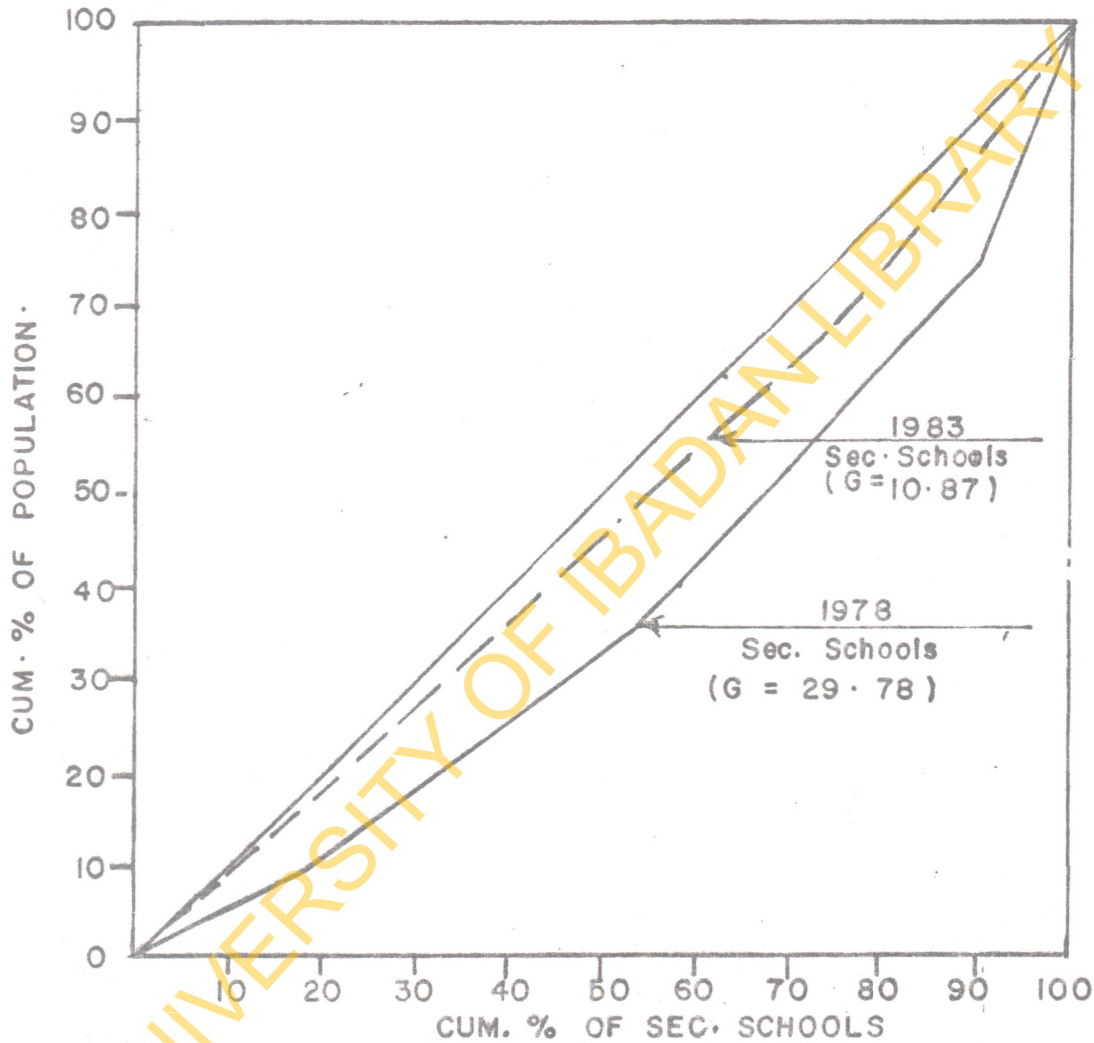


Fig. 4.5: Lorenz Curves showing the distributions of Sec. Schools among rural areas of Oyo State, 1978 & 1983.

Figure 4.5 also whows that schools were more widely spread among rural areas in the State in 1978 than in 1983. The gaps between 45° diagonal plot and Lorenz curve in 1983 show spatial concentration of schools in few rural settlements in 1983. In Figure 4.6 secondary school teachers were more unequally distributed among rural areas of the 24 Local government areas of Oyo State in 1978 than in 1983. The gaps between 45° diagonal line and Lorenz curves confirm this notion.

In this section it has been shown that there was spatial inequality in the distribution of secondary schools and teachers among Local government areas of Oyo State in 1978 and 1983. However, there is need to relate the distribution of schools and teachers to population needs (secondary school-age population) of each Local government area in order to see whether differentiation in the distribution of schools and teachers in 1978 and 1983 was justified. The next section examines the degree of equitable distribution of secondary schools and teachers among Local government areas of Oyo State in 1978 and 1983.

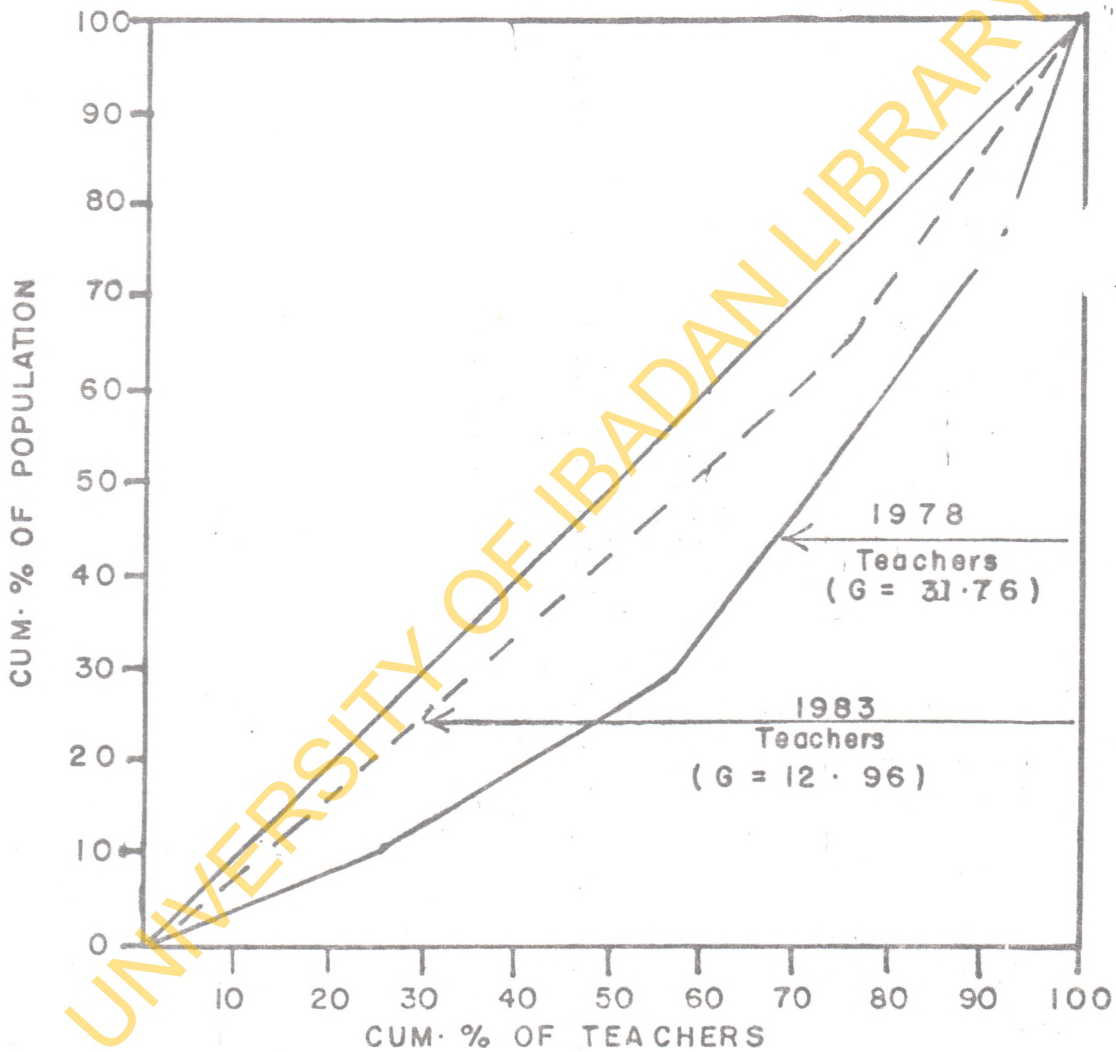


Fig. 4·6: Lorenz curves showing the distributions of Teach... rural areas of Oyo State, 1978 & 1983.

Table 4.4: Variations in the Ratio of Advantage to Secondary School Services in Oyo State - 1978 and 1983

		Among L.G.A.s				Among Urban Areas				Among Rural Areas			
		Sec. Schools		Teachers		Sec. Schools		Teachers		Sec. Schools		Teachers	
	L.G.A.	1978	1983	1978	1983	1978	1983	1978	1983	1978	1983	1978	1983
1.	Akinyele	0.72	1.29	0.53	1.03	-	-	-	-	1.06	1.08	1.15	1.31
2.	Atakumosa	0.97	1.37	0.82	1.01	-	-	-	-	1.42	1.21	1.76	1.28
3.	Ede	0.86	0.58	0.80	0.58	0.87	0.48	0.76	0.56	0.68	1.03	0.57	0.94
4.	Ejigbo	0.80	0.87	0.81	0.69	1.27	..06	1.25	0.77	0.50	0.71	0.50	0.72
5.	I.M.G.	1.25	1.45	1.80	2.09	1.09	1.57	1.39	1.85	0	0	0	0
6.	Ibarapa	1.34	1.44	0.99	1.00	0.98	0.41	0.87	0.85	2.63	1.98	1.48	1.36
7.	Ifedapo	0.80	0.95	0.87	0.84	0.51	0.75	1.22	1.17	1.55	1.17	0.55	0.33
8.	Ifelodun	1.06	0.79	1.18	0.84	0.81	0.67	0.82	0.60	2.36	1.33	3.50	0.93
9.	Ila	0.41	0.60	0.30	0.33	0.56	0.59	0.27	0.28	0	0.85	0	0.6
10.	Ilesa	1.89	0.96	2.24	1.34	1.65	1.04	1.73	1.19	0	0	0	0
11.	Irepo	0.42	0.48	0.34	0.35	0.51	0.58	0.37	0.39	0	0.30	0	0.14
12.	Irepodun	0.43	0.29	0.36	0.32	0.38	0.31	0.27	0.29	0	0	0	0
13.	Irewole	0.91	1.00	0.68	0.96	1.20	1.45	0.86	1.03	0	0.43	0	0.82
14.	Iseyin	1.09	0.87	0.81	0.77	0.62	0.78	0.81	0.53	2.36	0.97	1.05	1.26
15.	Iwo	0.60	0.58	0.50	0.60	0.69	0.50	0.65	0.55	0.47	0.67	0.22	0.39
16.	Kajola	1.17	1.03	0.62	0.72	1.44	1.11	0.54	0.65	0	0.92	0	0.89
17.	Lagelu	0.41	1.04	0.36	0.81	0.33	0.26	0.41	0.26	0.52	1.03	0.72	0.96
18.	Obokun	2.27	1.59	1.95	1.29	2.79	1.36	2.12	1.17	2.99	1.41	3.78	2.19
19.	Odo-Otin	1.01	0.73	0.65	0.57	0.80	0.47	0.62	0.39	1.76	1.20	0.63	1.08
20.	Ogbomoso	0.73	0.86	0.64	0.76	0.51	0.73	0.38	0.74	0.17	0.97	0.27	0.84
21.	Oluyole	1.85	1.59	1.75	1.19	0	0	0	0	2.30	1.41	3.77	1.51
22.	Oranmiyan	1.67	1.43	1.54	1.27	2.67	2.02	2.73	2.07	1.14	1.02	0.57	0.75
23	Osogbo	0.62	0.66	0.82	0.81	1.31	0.72	1.53	0.72	0	0	0	0
24	Oyo	0.87	1.06	1.14	1.12	1.19	1.36	1.37	1.42	0.26	0.68	0.49	0.55
	State					1.14	0.92	1.30	1.13	0.68	1.13	0.46	0.79

Source: Computed from Table 3.5

4.5 Inequality in the distribution of Secondary Schools and Teachers in Oyo State, 1978 and 1983.

It has been noted in section 4.3 that both the Federal and State governments aimed at locating schools among regions and within regions of Nigeria on the basis of even geographical spread and population. Distribution on the basis of need is often used to justify the legitimacy of spatial differentiation. An equitable distribution is one that shares out benefits and costs proportionately to people's needs and capacities, with equal treatment for persons of similar needs and capacities. On the assumption that all secondary school-age population require secondary school facilities, it follows that such facilities should be distributed according to population size. In the case of the allocation of secondary schools among Local government areas and urban and rural areas of Oyo State, significant variation is apparent, although it is doubtful that it is on the basis of need, that is with 'needy' areas receiving proportionately more facilities. The last section looked at 'arithmetic equality' in the distribution of schools and teachers across the three spatial scales of analysis but in this section 'proportional equality' in the allocation of secondary school facilities among Local government areas is closely examined in order to

to see whether each of the 24 Local government areas got what it deserved. This section uses the concept of 'proportional equality' to evaluate spatial distribution of secondary schools and teachers among the 24 Local government areas of Oyo State at the two time periods in order to find out whether accessibility to secondary schools has improved or not.

(i) Inequality in the Distribution of Schools among LGAs

Examination of Table 4.4 shows that significant spatial inequities in the provision of secondary school educational facilities existed between 1978 and 1983.

Table 4.5: Variations in the Gini-Coefficients in the allocation of secondary schools and teachers among LGAs and Urban and Rural Areas - 1978 and 1983

Statistics and Spatial Units	Gini-Coefficients	
	1978	1983
1. Among LGA		
(i) Secondary Schools	19.04	14.63
(ii) Teachers	23.09	19.26
2. Among Urban Areas		
(i) Secondary Schools	19.27	21.28
(ii) Teachers	23.65	25.34
3. Among Rural Areas		
(i) Secondary Schools	10.87	29.78
(ii) Teachers	31.76	12.96

Source: Computed with Data from Tables 4.2 and 4.3

Note: The higher the Gini coefficients the more inequitable is the facility among LGAs.

Ratios of advantage varied widely among Local government areas and between the two time periods. Ratio of advantage to secondary schools ranged between 2.27 in Obokun Local government area through 0.41 in Lagelu Local government area in 1978. In 1983 ratio of advantage to secondary schools ranged between 1.59 in Oluyole to 0.29 in Irepodun Local government areas. Table 4.4 shows that secondary schools were more inequitably distributed among Local government areas in 1978 (G = 19.04) than in 1983 (G = 14.63). This implies that the educational programme of the State government has undoubtedly increased people's accessibility to secondary school education in 1983. For instance in Table 4.6 number of advantaged Local government areas with favourable accessibility to secondary schools increased by 10 percent in 1983 in the State.

When services are decentralised lossees may be experienced in the urban centres and gains may be experienced in rural areas. Hence urban centres among Local government areas experienced loss in the proportion of secondary schools they controlled in 1983 while rural areas experienced gain in the proportion of State's seconday schools in the urban areas (See Table 4.6).

Table 4.6: Level of Improvement in the Accessibility LGA to Secondary School Education in Oyo State, 1978 and 1983

Statistics and Spatial Units		No. of Advantaged LGAs		% Change +/-
		1978	1983	
1. Among LGA:	Sec. Schools	10	11	+10
	Teachers	7	9	+28.57
2. Among Urban Areas:				
	Sec. Schools	9	8	-11.11
	Teachers	8	7	-12.5
3. Among Rural Areas:				
	Sec. Schools	10	11	+10
	Teachers	7	7	-

Source: Computed from Table 4.4

There was increased inequality in the allocation of secondary schools in the urban areas in 1983 while reduced inequity was experienced in the rural areas in 1983. This is confirmed by the Gini coefficients of 19.27 in 1978 and 21.28 in 1983 in the urban areas; while the Gini coefficients of 10.87 (1978) and 29.78 (1983) show increased inequity in the allocation of schools among rural areas. Generally speaking, there were no overwhelming discrepancies in the distribution of secondary schools

among Local government areas and urban and rural areas of Oyo State in both 1978 and 1983.

(ii) Inequity in the Allocation of teachers among Local Government, Urban and Rural Areas of Oyo State 1978 and 1983

The State government educational policy has spread secondary schools among Local government and among urban and rural populations and settlements thus making secondary schools to be more accessibile to the people. The distributional improvements in the allocation of secondary schools to the population across Local government areas and rural areas do not signify the same measure of improvements in the allocation of teaching personnel across local govenment areas of the State. The allocation of secondary school teachers was based on enrolments in schools. Schools with large enrolments controlled a large proportion of teachers.

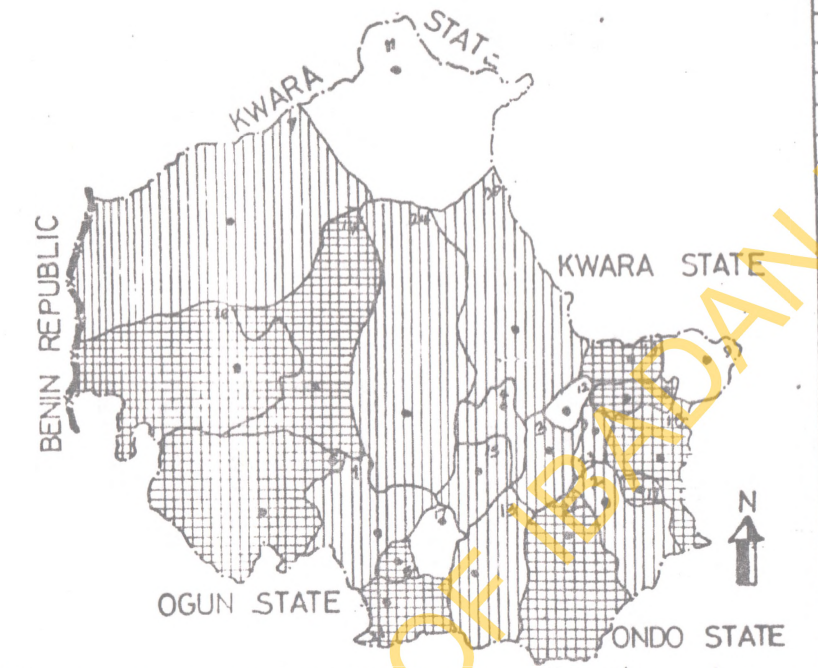
Examination of Table 4.5 shows that secondary school teachers were more inequitably distributed among Local government areas in 1978 (G = 23.09) than in 1983 (G = 19.26) implying more accessibility of the population to teaching personnel in 1983. Inequity in the distribution of teachers among Local government areas decreased by 16.59 percent in 1983. Inequity in the allocation of

teachers among urban centres in the Local government areas of Oyo State increased (from G = 23.65 in 1978 to G = 25.34 in 1983) by 7.15 percent. This implies that population in urban centres could experieince reduced accessbility to secondary school teachers. On the other hand, the redistributive tendency of State government policy on secondary education was felt more in the rural areas than in the urban centres of the State. This is because inequity in the allocation of teachers decreased from G = 31.76 in 1978 to G = 12.96 in 1983 or by 59.19 percent in 1983. By implication rural areas that had experienced poor accessibility to teaching personnel before 1979 enjoyed improved access to them in 1983. Generally speaking, the proliferation of secondary schools and teachers in the State improved accessibility of the State's population to schools and teachers by 23.16 and 16.59 percent respectively in 1983. The policy has decreased accessibility of urban population to secondary schools and teachers in the State by 10.43 and 7.15 percent respectively in 1983. Proliferation of secondary schools in Oyo State between October 1979 and October 1983 has reduced inequities in the distribution of secondary schools among Local government areas of Oyo State leading to more accessibility of the population to the service provided.

The goal of evaluation studies is concerned with efficiency, effectiveness, adequacy quality and quantity of service delivery. Evaluation research can be very helpful in improving and restructuring services (Seley, 1981). Need arises in knowing advantaged and disadvantaged Local government areas in Oyo State in respect of secondary schools. The question is, which Local government areas were better or worse off as a result of free education at att levels programme of Oyo State goverment? The next section examines this question.

4.6 Classification of Local Government Areas of Oyo State According to Their Ratio of Advantage to School Facilities, 1978 and 1983

Local government areas of Oyo State benefitted differently from State's educational policy in 1983. There is need to group Local government areas of the State according to their relative advantage or disadvantage in respect of secondary school facilities so as to guide planners in their future educational planning efforts. It is the researchers conceptualization that hierarchy that possesses three distinctive levels of advantage to secondary school facilities exists. Such classes are: High advantage class of Local government areas with more than 1.00 ratio of advantage; moderately served Local



No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary
State boundary
L G A boundary
• L G Headquarters

Scale : 1:50,000

FIG. 4.7: Patterns of inequity in the allocation of secondary schools to population among L G As of Oyo state, 1978.

KEY
High advantage
Moderate advantage
Poor advantage

government areas with 0.5 - 1.00 ratio of advantage and poorly served class of less than 0.5 ratio of advantage. Non-hierarchical grouping as used in this study enables identification of similarities in the educational development among Local government areas. Classifications derived by way of measured attribute, for example adequacy of secondary schools, contains a good deal of information and deepens researcher's insight into the understanding of the inter-relationships between availability of secondary schools and other variations such as natural resources, income, possession of political power, settlement and population characteristics, and so on. Given the above stated advantages of classification technique it is therefore employed in this study.

The pattern of educational development is shown in Figures 4.7 through 4.10. In Figure 4.7 it is shown that 10 Local government areas were highly developed educationally, 10 were moderately developed while four, Lagelu, Irepodun, Ila and Irepo were poorly developed. The backwash effects of Ibadan on Lagelu Local government area, poor development of urban centres could be some of the reasons for the poor educational development of Lagelu. Ila and Irepo Local government areas have suffered in the past for poor access roads, long distance from

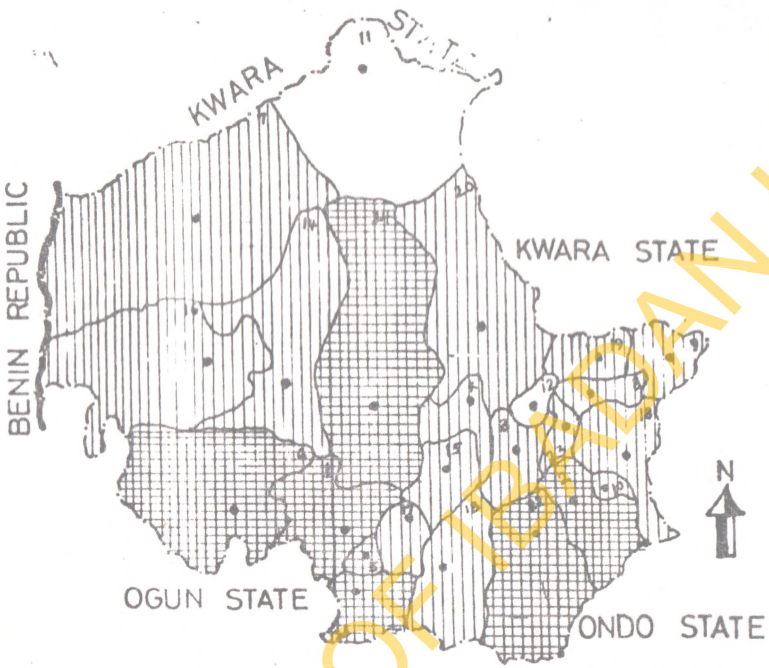


FIG.4.8: Patterns of inequity in the allocation of secondary schools to population among LGAs of Oyo state, 1983.

KEY
- High advantage
- Moderate advantage
- Poor advantage

No	L G A
1	Akinyele
2	Atakunmos
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole.
22	Oranmiyan
23	Osogbo
24	Oyo

- International Boundary
- State boundary
- LGA boundary
- L G Headquarters

Scale: 1:50,000

Ibadan (which reduce information flow) and poor soil conditions, which prove unattractive to local and migrant farmers to grow industrial crops. The poor educational development of these areas are therefore not surprising. The backwash effect of Osogbo on Irepodun Local government area could be a strong factor in the educational development of Irepodun Local government area.

The widespread educational facilities in 1983 manifested itself in widespread educational development among Local government areas of Oyo State. The poorly educationally developed Local government areas decreased from four to two. Irepodun and Irepo Local government areas maintained their poor educational status (See Figure 4.8).

Teachers are attracted to areas where there is abundant provision of socio-infrastructural facilities but the supply of these facilities is contingent on threshold population and development of urban centres. In Figure 4.9 it is revealed that seven Local government areas were well supplied with teachers while 12 were fairly provided with teachers and the rest five Local government areas (Irepo, Ifedapo, Ila, Irepodun and Lagelu were inequitably supplied with teaching personnel. The

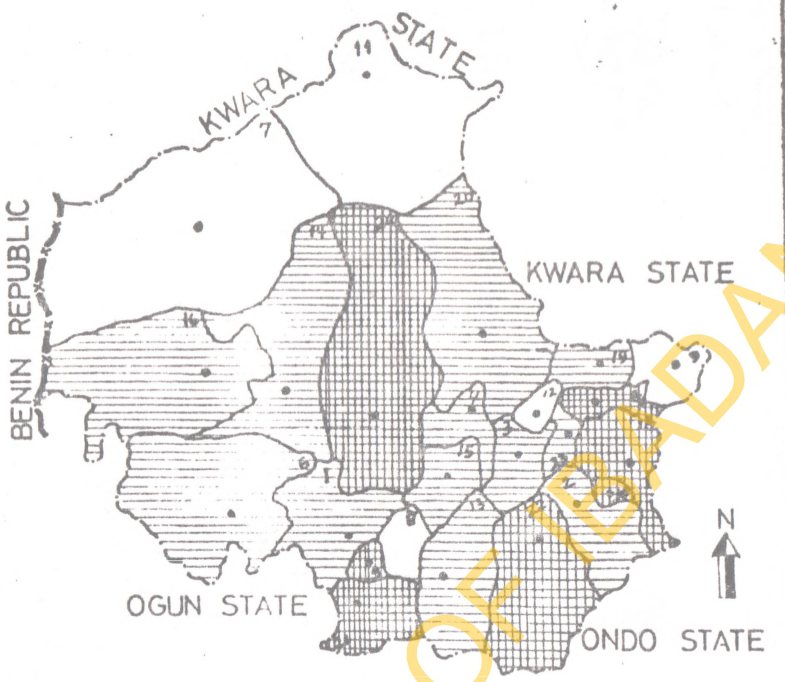


FIG.4.9: Patterns of inequity in the allocation of teachers to secondary schools among LGAs of Oyo state, 1978.

KEY

- High advantage
- Moderate advantage
- Poor advantage

No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Egbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

- International Boundary
- State boundary
- L G A boundary
- • L G Headquarters

Scale: 1:50,000

situation changed in 1983 when there was proliferation of secondary schools and teachers. Figure 4.10 shows that Irepo, Irepodun and Ila were indaequately provided with teaching staff in 1983 while the rest 21 Local government areas were adequately provided with staff. The pattern of inequity in the distribution of educational facilities shows that peripheral Local goverment areas fronting neighbouring States and Benin Republic were educationally disadvantaged at both time periods. The State government's educational policy has increased educationally developed Local government areas by 10 percent hence enrolments in secondary schools increased from 116,744 to 457,477 or by 292 percent.

The conclusions that can be drawn from the above analysis include: One, inspite of State government's policy of mass provision of secondary schools in Oyo State, inequalities and inequities in the distribution of secondary schools and teachers existed. Two, free education at all levels policy has redistributed secondary school facilities in a more egalitarian direction than hitherto experienced in 1979. The policy has benefitted rural areas more than the urban centres. This implies that the mass provision of secondary school education facilities has led to a proportionate increase of rural population

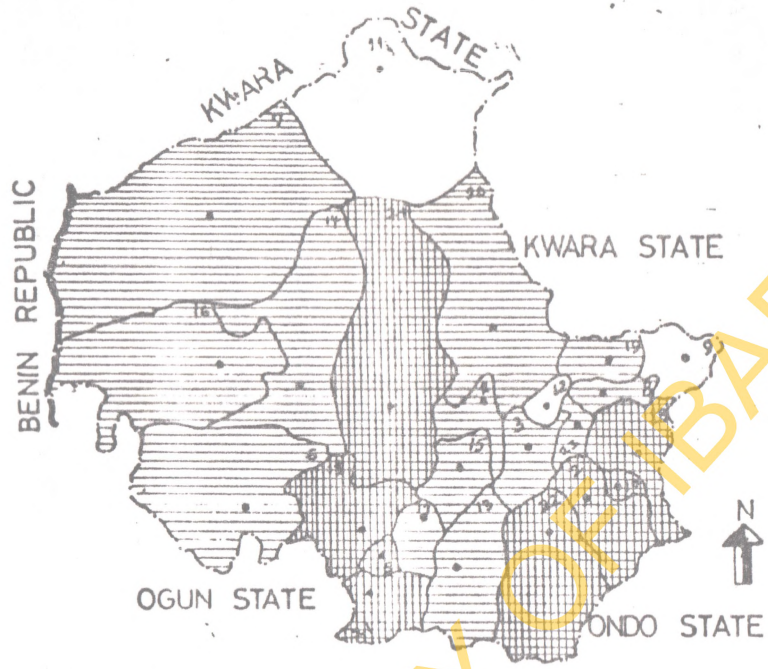


FIG.4.10: Patterns of inequity in the allocation of teachers to secondary schools among LGAs of Oyo state, 1983.

KEY
- High advantage
- Moderate advantage
- Poor advantage

	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Eruigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

- International Boundary
- State boundary
- L G A boundary
- L G Headquarters

Scale : 1:50,000

with access to secondary school education. Generally speaking, the educational policy of Oyo State government (1979-1983) has redistributed Secondary School facilities in a more egalitarian direction. The policy has led to decentralization of secondary school facilities from urban centres to rural parts of the State, thus making a greater proportion of the State population to have more access to secondary education than ever before.

CHAPTER FIVE

AN ANALYSIS OF DISTRIBUTIONAL EFFICIENCY OF SECONDARY SCHOOL FACILITIES IN OYO STATE

5.1 Introduction

In the last chapter attention was focused on the inequality and inequity in the distribution of secondary school facilities among Local government, urban and rural areas of Oyo State. The findings revealed that: one, there were no overwhelming discrepancies between secondary school-age population and secondary school facilities. Two, the State government educational policy has improved hence average distance covered by the people to reach secondary school decreased. Three, the mass provision of secondary schools in Oyo State has increased access of the people of the State in 1983 more than what obtained in 1978. In 1978 only 10.61 percent of Secondary School-age population were in schools and the figure increased to 36.31 percent in 1983 partly because of mass provision of secondary school services, and partly because of the education policy practiced in the State between 1979 and 1983. Since 1950s efforts have been made in the old Western Region of Nigeria in making the major planning objective by succeeding administrations in the region a just and egalitarian society particularly in the area of

social services. Since 1950s through 1979, the distribution of educational services had been left for a long time without an overall distributional strategy. Distributional efficiency is important to the providers and consumers partly because the consumers will benefit from the services.

The present chapter is designed to evaluate the distributional efficiency of secondary school facilities across Local government areas in both 1978 and 1983. Locational efficiency of secondary schools in their various points of location within each of the 24 Local government areas is not the focus of this chapter but distributional efficiency within each of the 24 Local government areas. The reasons for this include: One, the schools and Local government areas are too many for the time and resources at the disposal of the researcher. Two, population data for settlements are not available in the desired form; and since most of the settlement names in each of the 24 Local governments areas did not appear in 1963 population figures for those settlements. For these reasons the researcher analysed the distributional efficiency of secondary school services among Local government areas of Oyo State on the basis of the principles set by the government. Within the existing framework of distribution criteria this chapter

discusses the concept of distributional efficiency as it relates to the distribution and consumption of secondary school services across Local government areas of Oyo State. The extent to which State government policy on education (1979-1983) improves efficiency in the distribution of secondary schools is examined. Put another way, are policy statements and practical realities in less developed countries of the world often the same thing? What attempts have been made by the State government to ensure compliance with the laid down distributional principles? As mass provision of secondary schools or State government policy on education led to efficiency in the distribution of secondary school resources in the State? This chapter is set out to examine these questions.

5.2.1 A Model For The Analysis of Distribution of Secondary Schools

Distributional efficiency involves the degree to which the spatial organisation of a given public good approaches optimality defined with respect to a given criterion. While the criterion would differ from facility to facility, it is also reasonable to accept that it could differ from one ecological zone to another or from one region (for example, urban/rural) to another (Ayeni, et al, 1985). Nevertheless, one way of measuring the degree of

tributional efficiency of a social service is to anlyse the extent to which existing distributions of secondary schools conform with the State government laid-down principles. Development is about the people and consequetly the distributions of secondary schools should be directly related to specific population.

The threshold population of a secondary school in either the urban or rural area, can be described as the minimum population that justifies the allocation of scarce financial and personnel resources to its establishment and maintenance. Below that level there are too few pupils to allow the school to operate with acceptable efficiency. This threshold population again depends on the minimum acceptable enrolments for individual schools in different regions (See Table 5.1). Distributional standards as laid down by the State government posit that for any school to be efficiently run it should meet the required threshold population as measured by pupils enrolment. For instance there is little sense in locating secondary school in a small remote village which can neither provide basic infrastructure for the survival of the school nor whose population cannot provide enough enrolments to constitute a viable threshold within a certain range.

There is a distance limit within which secondary school-age population could walk to avail themselves of secondary school education. The demand field for secondary education is wide and the search for a central location becomes critical. The demand of secondary schools for other resources such as water, electricity supply, housing, and so on requires that they be located in settlements of fairly large size. Furthermore, also applicable is the deduction that persons wishing to consume a public facility are likely to be influenced by the distance separating them from the facility, and hence are likely to take advantage of the facility that is closest to them. The next section briefly examines the distributional standards of secondary schools and the methodology adopted in measuring efficiency level of the distribution of secondary schools before and during free education at all levels period.

5.2.2 Oyo State Government Distributional Standards of Secondary School Facilities

The State government realised that the provision of secondary school facilities in an egalitarian direction involved more financial outlay than was available, therefore the issue of efficiency of their distribution calls for basic principles within which to approve the provision of such facilities. In recent years, attention

is being called to issues of physical planning, accessibility, location and distribution of social services especially education. In both the Third National Development Plan (1975-1980) and National Policy on Education (Revised, 1981) specific attention was drawn to the allocation of educational facilities to overall community needs or the distribution of social services on a geographical and population basis. Planning standards may be defined as specification by which the qualities required of services may be tested. social planning therefore 'seeks to achieve expanding opportunities for the raising of the standard of life of the whole population, through deliberate steps initiated by government'(Bruton, 1974, ed). The purpose of planning lies in the equitable provision of facilities in relation to population needs, improvement of economic status of the people and improving the level of efficiency in service delivery.

There are both positive and normative planning standards. Normative planning standards deal with standards that are required of provision of services. Onokerhoraye (1982) identifies four types of normative planning standards. The first type relates a given population to recommended amounts of space allocated to establishments. while the second identifies the minimum physical structures and

and ancillary facilities that should be available in any establishment providing a particular public service. The third type relates a given population to demands for certain indivisible facilities and finally the fourth type focuses on the location and accessibility of indivisible facilities in relation to the population which is supposed to use them. It is obvious that where normative planning standards fail to provide a useful framework for planning, positive planning standards will become the answer (Onokerhoraye, 1982). However the distributional efficiency of secondary schools in 1978 and 1983 will be evaluated within the forth type of normative poanning standards as shown above.

Table 5.1 shows planning standards (set by the Ministry of Education, Research & Planning, Ibadan) relating to the provision of secondary school services in Oyo State at the two time periods and in two different regions. Planning standards for the distributions of secondary schools are influenced by the age composition of the population and/or threshold population. There are differences in the population characteristics in both urban and rural regions of Oyo State and as such differences exist in the planning standards acceptable in the two regions and at the two time periods. The State government, between 1979 and 1983, aimed at 100 percent transition from primary school to secondary school level; and

since education was made free, enrolment per class and per school equally increased. Since conditions relating to the provision of schools in the State were not identical in the two time periods therefore the distributional principles of schools among Local government areas differed (See Table 5.1).

The standard class sizes in most parts of Nigeria in 1978 and 1983 were about 35 and 40 pupils per class respectively. Small classes are clearly inefficient since the largest item of cost of secondary school education is the cost of teachers' salary. A low pupil/teacher ratio will be expensive per pupil-space (Callaway, 1881; Briggs, 1981; Oyo State, 1980). Consequently in 1979, the political party in power in the state increased class size so that the average class size ranged between forty and fifty. The planning literature of both the Federal and State governments, prior 1979, shows that the planning standard size of a secondary school in Nigeria was about three streams of 35 pupils per class for each of the five classes in the urban centres; while the corresponding figures for rural areas were two streams of about thirty pupils per class for each of the five classes (See Table 5.1). In 1983 the policy of the state government necessitated an increase in the number of streams and class enrolments

TABLE 5.1: Planning Standards relating to the Distribution of Secondary School Services in Urban and Rural Areas of Oyo State, 1978 and 1983

Statistics	1978		1983	
	Urban	Rural	Urban	Rural
Number of classes per School	15	10	25	15
Number of pupils per class	35	30	40	30
School/Pupil ratio	1:525	1:300	1:1,000	1:450
Teacher/Pupil ratio	1:52	1:45	1:60	1:45

Source: Ministry of Education (Research and Planning Division) Ibadan

TABLE 5.2: Summary Table Showing the Distribution of Secondary School Services in Oyo State 1978 and 1983

Statistics and Spatial Units	1978 Urban		1978 Rural		1983 Urban		1983 Rural		State total 1978		State total 1983		Level of inefficiency 1978	Level of inefficiency 1983
	Observed	Expected	Observed	Expected	Observed	Expected	Observed	Expd.	Obs.	Exp.	Obs.	Exp.		
i) L.G.A (a) Secondary Schools	166	175	68	86	397	323	294	309	234	261	691	632	11.54%	8.54%
(b) Teachers	3629	1752	885	556	11870	7108	5017	3085	4514	2308	16887	10166	48.87%	39.80%
ii) School/Enrolment ratio	1:549	1:498	1:368	1:237	1:805	1:990	1:468	1:450	1:499	1:426	1:662	1:2003	754%	202.57
iii) Teacher/Pupil ratio	1:22	1:394	1:28	1:850	1:64	1:110	1:27	1:154	1:26	1:482	1:27	1:124	1753.85	359.26

Source: Computed from Table 3.5

in order to cope with the huge demand for secondary school education at both urban and rural areas (See Table 5.1). The increase in enrolment per class demands additional increase in the number of teachers. However, the allocation principle of one teacher to one and half classes did not alter. Consequently, a secondary school would require 525 and 300 pupils in urban and rural areas respectively in 1978; while the corresponding figures were 1,000 and 450 pupils in 1983. The question is: How did secondary schools provided in 1978 and 1983, relate to the State government distributional standards as shown in Table 5.1.

The problem of inequalities for access to secondary schools may be related to inefficient distribution of facilities and services. In chapter three it has been shown that mass provision of secondary schools in Oyo State (1979-1983) has improved accessibility of the people to secondary education over the years.

In obtaining the expected number of schools and pupils in the state and among Local government areas, the official criteria as laid out in Table 5.1 were applied. Enrolments among Local government areas, in urban and rural areas of each of the 24 Local government areas were obtained from the official records. In 1978 urban-located secondary

school was expected to have three streams in a class of 35 pupils and in each of the five classes giving an expected and/or optimum enrolment per school of 525 as against 300 in a rural school. The observed enrolments per school was simply obtained by dividing actual enrolments in a Local government area by the number of schools in that Local government area. Secondary school-age population in each Local government area was obtained by multiplying the gross population in each Local government area by 14.6% (the nationally accepted secondary school-age population). Gross urban and rural population in each Local government area were obtained, and for each Local government area, the urban and/or rural populations were obtained by multiplying the projected urban and rural population by 14.6%, so as to obtain urban and/or rural secondary school-age populations for each Local government area. These form expected urban and rural enrolments for each Local government area. Having obtained expected urban and rural enrolments and the standard school/enrolments ratios; each projected urban and rural populations were divided by 525 (urban) and 300 (rural in order to obtain expected and hence optimum number of schools for each Local government area, urban and rural areas. The same process was applied to obtain optimum numbers of secondary schools in each Local government area, urban ane rural areas in 1983. By this the numbers of observed and expected numbers of schools in

in each of the Local government areas of the state were measured.

Distributional standards for teacher/pupil ratios in urban and rural areas were set out in Table 5.1. Total enrolments in urban centre and total number of teachers in urban centres per Local government area were given. To obtain the actual or observed teacher/pupil ratio in a Local government area, the enrolment figure was divided by the total number of teachers. The same process was applied to urban enrolments and/or urban and rural enrolments in 1983 (See Tables 5.6 & 5.7). To obtain the expected urban and rural teacher/pupil ratios in either 1978 or 1983, the expected enrolments in urban centres were divided by the expected number of teachers in urban centres of each Local government area. The same was applied to rural populations. By these methods the observed or actual and optimum numbers of secondary school teachers for each of the 24 Local government areas and in the urban and rural areas of each Local government area were measured (See Tables 5.3 & 5.4).

In the computation of optimal level of the distribution of secondary schools and teachers among Local government areas in the State, percentage difference was calculated. For instance, the difference between optimum

TABLE 5.1 Optimum allocation of Secondary Schools among Local Government Areas of Oyo State, 1978 & 1983

	L.G.A.	Total No. of Schools		Optimum No. of Schools		Optimum distribution of Schools, 1978		Optimum distribution of Schools, 1983	
		1978	1983	1978	1983	Urban	Rural	Urban	Rural
1.	Akinyele	6	30	8	33	0	8	0	33
2.	Atakumosa	6	25	8	26	0	8	0	26
3.	Ede	7	15	7	15	6	1	8	7
4.	Ejigbo	4	13	5	14	3	2	4	10
5.	I.M.G.	35	120	44	107	44	0	107	0
6.	Ibarapa	7	22	5	19	4	1	7	12
7.	Ifedapo	5	18	6	11	3	3	8	3
8.	Ifelodun	10	22	12	23	8	4	11	12
9.	Ila	3	13	2	9	2	0	6	3
10.	Ilesa	14	21	15	16	15	0	16	0
11.	Irepo	3	10	2	10	2	0	8	2
12.	Irepodun	3	6	2	4	2	0	4	0
13.	Irewole	11	36	9	29	9	0	21	8
14.	Iseyin	8	19	7	20	3	4	6	14
15.	Iwo	9	26	8	22	7	1	12	10
16.	Kajola	6	15	3	13	3	0	7	6
17.	Lagelu	4	30	7	28	1	6	1	27
18.	Obokun	18	35	20	36	4	16	6	30
19.	Odo-otin	8	17	16	15	8	8	7	8
20.	Ogbomoso	11	39	9	38	8	1	15	23
21.	Oluyole	9	23	15	24	0	15	0	24
22.	Oranmiyan	28	71	28	66	21	7	30	36
23.	Osogbo	7	22	9	16	9	0	16	0
24.	Oyo	12	43	14	38	13	1	23	15
	Total	214	691	261	632	175	86	323	309

Source: Computed from Tables 5.3 and 5.9

TABLE 5.4: Optimum Distribution of Secondary School Teachers among Local Government Areas of Oyo State, 1978 & 1983

	L.G.A.	Total No. of Teacher		Optimum No. of Teachers		Optimum distribution of Teachers, 1983		Optimum distribution of Teachers, 1978	
		1978	1983	1978	1983	Urban	Rural	Urban	Rural
1.	Akinyele	85	617	50	332	0	332	0	50
2.	Atakumosa	97	451	51	258	0	258	0	51
3.	Ede	125	390	64	248	175	73	60	4
4.	Ejigbo	78	251	47	190	85	105	32	15
5.	I.M.G	971	1,237	445	2,380	2,380	0	445	0
6.	Ibarapa	99	375	44	286	164	122	39	5
7.	Ifedapo	104	378	51	214	182	32	28	23
8.	Ifelodun	214	571	105	368	252	116	79	26
9.	Ila	42	176	19	170	137	33	19	0
10.	Ilesa	320	719	148	366	366	0	148	0
11.	Irepo	47	179	24	120	105	15	24	0
12.	Irepodun	48	163	22	98	98	0	22	0
13.	Irewole	158	841	91	544	462	82	91	0
14.	Iseyin	115	412	56	265	123	142	29	27
15.	Iwo	144	651	71	370	271	99	67	4
16.	Kajola	61	267	29	211	154	57	29	0
17.	Lagelu	68	575	43	282	15	267	6	37
18.	Obokun	297	738	149	418	123	295	40	109
19.	Odo-Otin	99	326	134	230	149	81	81	53
20.	Ogbomoso	185	839	83	556	331	225	79	4
21.	Oluyole	164	420	98	242	0	242	0	98
22.	Oranmiyan	499	1,542	260	1,034	671	363	216	44
23.	Osogbo	178	658	88	350	350	0	88	0
24.	Oyo	302	911	136	681	515	146	130	6
	Total	4,500	10,887	2,308	10,193	7,108	3,085	1,752	556

Source: As of Table 5.3

and actual numbers of secondary schools was calculated and divided by actual/or observed figure in the same year and then multiplied by 100. The same process was applied to urban and rural secondary school services (See Tables 5.3, 5.4 and 5.5). Maximal efficiency in the distribution was obtained when the observed number of secondary school service equalled the expected or optimum number. Most sub-optimality in the distribution occurs when the difference between observed and optimum secondary schools is equal to the observed secondary schools. Based on the state distributional standards the measure of efficiency applied in this thesis are set out in Table 5.2.

5.3 Optimum Distribution of Secondary School Facilities In Oyo State, 1978 & 1983

(i) Secondary Schools: In 1978 there were 234 secondary schools in the State and the distribution of the schools ranged between 35 in Ibadan Municipal to as low as 3 in Ila Local government area. If secondary schools were provided in the state in relation to population or need there should be 261 secondary schools instead of 234. An optimal and hence efficient pattern of distribution of people i.e. secondary school-age population as shown in Table 5.2 . indicates that the State was under-provided with secondary

schools by 11.54 percent. In 1983 education was made an object of political debate and in an attempt to fulfil its promises, the party in power provided secondary schools in all the Local government areas of the State without any reference to the population needs of each Local government area. Consequently there was over-provision of secondary schools in the State in 1983. A total of 691 instead of the efficient number of 632 secondary schools were provided in the State. Secondary schools were inefficiently provided in the State by 8.54 percent (See Table 5.5). Inefficiency in the provision of secondary schools among Local government areas in both 1978 and 1983 varied widely.

Table 5.5 also shows that secondary schools were inefficiently provided among urban areas in 1978 and 1983. Secondary schools were under-provided in 1978 by 5.42 percent and overprovided by 18.64 percent in 1983. In 1978, 166 schools instead of the optimum number of 175 were provided; and in 1983, 397 instead of 323 schools were provided. In the rural areas of the State the provision of schools was equally inefficient. In 1978, 68 instead of 86 schools were provided rural areas while in 1983, 294 instead of the optimum number of 309 schools were provided the rural areas of Oyo State. That is, to say, rural areas of Oyo State were under-provided with secondary schools

Table 5.5: Level of efficiency in the Distribution of Secondary School Facilities among Local Government Areas of Oyo State 1978 & 1983

Statistics and Spatial Units		Actual No.	Expected No.	Level of Inefficiency +/-
A Among LGAs				
(i) Secondary Schools				
	1978	234	261	-11.54
	1983	691	632	+ 8.54
(ii) Teachers				
	1978	4,514	2,308	+48.87
	1983	16,887	10,166	+39.80
B Among Urban Areas				
(iii) Secondary Schools				
	1978	166	175	- 5.42
	1983	397	323	+18.64
(iv) Teachers				
	1978	3,629	1,752	+51.72
	1983	11,870	7,108	+40.12
C Among Rural Areas				
(v) Secondary Schools				
	1978	68	86	-26.47
	1983	294	309	- 5.10
(vi) Teachers				
	1978	885	556	+37.18
	1983	5,017	3,085	+38.51

Source: Computed from Tables 5.3 & 5.4

Note: + = overprovision of facilities
- = underprovision of facilities.

Table 5.6 Variations in the ratios of Secondary School Services to Population in Urban and Rural Areas - 1978

		No. of Sec. Schools				Teachers				School/Enrolment Ratio				Teacher/Pupil Ratio			
		Urban		Rural		Urban		Rural		Urban		Rural		Urban		Rural	
		O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E
1.	Akinyele	0	0	6	8	0	0	85	50	0	0	378	225	0	0	27	76
2.	Atakumosa	0	0	6	8	0	0	97	51	0	0	383	225	0	0	24	77
3.	Ede	6	6	1	1	114	60	11	4	516	525	157	300	27	60	14	24
4.	Ejigbo	3	3	1	2	65	32	13	15	563	525	678	150	26	33	52	203
5.	I.M.G.	35	44	0	0	971	445	0	0	662	418	0	0	24	446	0	0
6.	Ibarapa	4	4	3	1	77	39	22	5	512	525	70	900	27	39	10	4
7.	Ifedapo	2	3	3	3	104	28	14	23	738	350	347	300	14	28	74	52
8.	Ifelodun	7	8	3	4	156	79	58	26	584	459	383	225	26	79	20	77
9.	Ila	4	2	0	0	42	19	0	0	242	1050	0	0	23	19	0	0
10.	Ilesa	14	15	0	0	320	148	0	0	551	490	0	0	24	148	0	0
11.	Irepo	3	2	0	0	47	24	0	0	408	788	0	0	26	24	0	0
12.	Irepodun	3	2	0	0	48	22	0	0	385	788	0	0	24	22	0	0
13.	Irewole	10	9	0	0	158	91	0	0	473	583	0	0	30	91	0	0
14.	Iseyin	3	3	5	4	86	29	29	27	497	525	240	375	17	29	41	29
15.	Iwo	7	7	2	1	144	67	12	4	499	525	89	60	24	67	15	67
16.	Kajola	6	3	0	0	49	29	0	0	253	1050	0	0	31	29	0	0
17.	Lagelu	1	1	3	6	14	6	54	37	321	525	558	150	23	6	31	167
18.	Obokun	5	4	13	16	83	40	214	109	411	656	379	244	25	40	23	70
19.	Odo-Otin	5	8	3	8	85	81	14	53	479	328	798	113	28	81	171	318
20.	Ogbomoso	10	8	1	1	164	79	21	4	411	656	173	300	25	79	8	26
21.	Oluyole	0	0	9	15	0	0	164	98	0	0	489	180	0	0	27	122
22.	Oranmiyan	20	21	8	7	447	216	52	44	562	500	250	343	25	216	38	33
23.	Osogbo	7	9	0	0	178	88	0	0	650	408	0	0	26	88	0	0
24.	Oyo	11	13	1	1	277	130	25	6	612	444	284	300	24	130	11	43
	Total	166	175	68	86	3629	1752	885	556	549	498	368	237	25	394	28	850

Source: Computed from Table 3.9

in both 1978 and 1983 by 26.47 and 5.10 percent respectively. The reasons for the high underprovision of secondary schools might be as a result of settlement isolation or dispersal, poor ability to orgnise community efforts to build schools and small size or rural settlements. At all scales of spatial consideration secondary schools (1978 and 1983) were not provided to meet the minimum standards required by the State government and hence they were inefficiently provided. Rural areas suffered deprivation in both 1978and 1983 and by implication rural population were being deprived of their right to education.

The recruitment of teachers in 1978 was done by individual schools' proprietors while in 1983 the recruitment and distribution of teachers among Local government areas was the responsibility of State Central Schools' Board. Differences in the efficiency of the distribution of teachers exist. Tables 5.4 shows that discrepancies exist between school enrolment as a surrogate of need and provision of teachers among Local government, urban and rural areas of Oyo State in 1978 and 1983. In 1978, there were 4,500 instead of the optimum number of 2,308 teachers in Oyo State. In effect teachers were inefficiently provided in the State by about 49 percent. In 1983, also lack of planning in the establishment of schools and provision

Table 5.7: Variations in the Ratio of Secondary School Services to Population in Urban and Rural Areas, 1983.

	L.G.A.	Number of Sec. Schools				Teachers				School/Enrol./Ratio				Teacher/Pupil Ratio				Teacher/Pupil Ratio
		Urban		Rural		Urban		Rural		Urban		Rural		Urban		Rural		
		O	E	O	E	O	E	O	E	O	E	O	E	O	E	O	E	1983
1.	Akinyele	0	0	30	33	0	0	617	332	0	0	498	452	0	0	24	17	24
2.	Atakumosa	0	0	25	26	0	0	431	258	0	0	464	446	0	0	26	17	26
3.	Ede	8	8	7	7	281	175	109	985	985	985	470	470	28	28	30	20	29
4.	Ejigbo	6	4	7	10	130	85	121	105	640	960	672	470	30	27	39	19	34
5.	IMG	120	107	0	0	4237	2380	0	0	892	1001	0	0	110	366	0	0	25
6.	Ibarapa	11	7	11	12	246	164	129	122	670	1053	499	457	30	47	43	10	34
7.	Ifedapo	7	8	1	3	325	182	53	32	1170	1024	130	475	25	45	27	61	25
8.	Ifelodun	14	11	8	12	375	252	96	116	810	1030	655	437	30	100	55	11	29
9.	Ila	10	6	3	3	140	137	36	33	615	1025	497	497	44	81	41	22	38
10.	Ilesa	21	16	0	0	719	366	0	0	785	1031	0	0	23	97	0	0	23
11.	Irepo	8	8	2	2	163	105	16	15	591	591	328	328	29	67	41	92	30
12.	Irepodun	6	4	0	0	164	98	0	0	737	1106	0	0	27	92	0	0	27
13.	Irewole	29	21	7	8	614	462	227	82	717	990	527	461	34	96	16	41	29
14.	Iseyin	9	6	10	14	183	123	223	142	613	920	639	457	30	56	29	15	29
15.	Iwo	16	12	10	10	475	271	176	99	763	1017	445	445	26	138	25	43	26
16.	Kajola	11	7	4	6	193	154	74	57	628	987	637	425	36	48	34	18	35
17.	Lagelu	1	1	29	27	30	15	459	267	673	673	414	445	22	30	26	22	22
18.	Obokun	8	6	27	30	207	123	716	295	691	921	492	443	27	29	19	15	25
19.	Odo-otin	7	7	10	8	173	149	153	81	956	956	366	457	39	71	24	21	32
20.	Ogbomoso	17-	15	22	23	514	331	325	225	875	992	460	440	29	111	31	27	30
21.	Oluyole	0	0	23	24	0	0	420	242	0	0	474	454	0	0	26	14	26
22.	Oranmiyan	36	30	35	36	1106	671	436	363	838	1006	467	454	27	86	38	20	30
23.	Osogbo	22	16	0	0	658	350	0	0	716	984	0	0	24	147	0	0	24
24.	Oyo	30	23	13	15	931	515	180	146	772	1007	506	438	25	106	37	27	27
	Total	397	323	294	309	11,870	7,108	5,017	3085	805	990	468	450	27	45	27	23	27

Source: Computed from Table 3.5

Table 5.5: Variations in the levels of Sub-Optimal Distributions of Secondary School Services in Oyo State 1978 and 1983

		Secondary Schools		Teachers		Secondary Schools (1978)		Secondary Schools (1983)		Teachers (1978)		Teachers (1983)	
		1978	1983	1978	1983	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1.	Akinyele	-33.33	-33.33	-41.18	-46.19	—	-33.33	—	-10	--	-41.18	—	-46.19
2.	Atakumosa	-33.33	-16	-47.42	-42.79	--	-33.33	--	- 4	--	-47.42	--	-42.79
3.	Ede	*100	*100	-48.8	-36.41	*100	*100	*100	*100	-37.5	-63.64	-37.72	-33.03
4.	Ejigbo	-75	- 7.69	-39.74	-24.30	*100	+100	-33.33	-42.86	-50.77	-15.38	-34.62	-13.22
5.	IMG	-25.71	-10.83	-54.17	-43.83	-25.71	--	-10.83	--	-54.17	—	-43.83	--
6.	Ibarapa	-28.59	-13.64	-55.56	-33.73	*100	-66.67	-36.36	-90.91	-49.35	-77.27	-33.33	-5.13
7.	Ifedapo	-20	-38.89	-50.96	-43.39	-50	*100	-14.29	-72.73	-73.08	-64.29	- 44	-39.62
8.	Ifelodun	-20	- 4.55	-50.93	-35.55	-14.29	-33.33	-21.43	- 50	-49.36	-55.17	-32.3	-20.83
9.	Ila	-33.33	-30.77	-54.76	- 3.41	- 50	---	- 40	*100	-54.76	——	- 2.14	- 8.33
10.	Ilesa	- 7.14	-23.81	-53.75	-49.37	- 7.14	---	-23.81	---	-53.75	——	-49.10	---
11.	Irepo	-33.33	*100	-48.94	-32.96	-33.33	---	*100	*100	-48.94	——	-35.56	- 6.25
12.	Irepodun	-33.33	-33.33	-54.17	-39.68	-33.33	---	-33.33	---	-54.17	——	-40.24	——
13.	Irewole	-18.18	-19.44	-42.41	-35.32	- 10	---	-27.59	-14.29	-42.41	——	-24.76	-63.64
14.	Iseyin	-12.5	- 5.26	-51.30	-35.58	*100	-20	-33.33	-40	-66.28	-6.90	-32.70	-36.32
15.	Iwo	-11.11	-15.38	-50.65	-43.16	*100	-50	-12.5	*100	-53.47	-66.67	-42.95	-43.75
16.	Kajola	- 50	-13.33	-52.46	-20.97	-33-33	--	-36.36	-50	-40.82	——	-20.21	-22.92
17.	Lagelu	- 75	-66.67	-36.76	-50.96	*100	+100	*100	-6.90	-57.14	-31.48	-50	-42.46
18.	Obokun	-11-11	- 2.86	-49.33	-43.36	-20	-23.08	-25	-11.11	-51.81	-19.07	-40.58	-56.60
19.	Odo-otin	+100	-11.76	-35.35	-29.45	-60	-166.67	*100	-20	- 4.71	-278.57	-15.67	-47.06
20.	Ogbomoso	-61.8	- 2.56	-55.14	-33.73	-20	*100	-11.76	- 4.55	-51.83	- 80.95	-25.60	-30.77
21.	Oluyole	-66.67	- 4.35	-40.24	-42.38	--	66.67	--	- 4.35	——	- 40.24	——	-42.38
22.	Oranmiyan	*100	- 7.04	-47.90	-32.94	-5	-12.5	-16.67	- 2.86	-51.66	-15.38	-39.53	-16.74
23.	Osogbo	-28.57	-27.27	-50.56	-46.81	-28.57	---	-27.27	----	-50.56	——	-46.81	---
24.	Oyo	-16.6	-11.63	-54.97	-40-50	-18.18	*100	-23.33	-15.38	-53.07	- 76	-44.66	-48.89
	State	11.11	8.54	48.71	38. 4	5.42	26.47	18.64	2.10	51.72	37.16	40.12	36.51

Note: * Optimal distribution
* Most inefficient level
- Below Optimum level.

Source: Computed from Tables 5.3 and 5.4

of teaching personnel is manifested in the overprovision of teachers by about 40 percent (See Table 5.5). Variations in the inefficiency level in the recruitement of teachers among Local government areas is shown in Table 5.8.

There are variations in the inefficient distribution of teachers among urban and rural areas too. In both 1978 and 1983 teachers were overprovided in urban areas of Oyo State. Teachers were inefficiently provided in urban centres of the State by roughly 52 percent in 1978 and by 40 percent in 1983. The urban centres of the State got more than their fair share of secondary school teachers in both 1978 and 1983 implying that pupils in areas with adequate teachers could perform better in the public examinations than areas that were underprovided with teachers. The situation in the rural areas in the two periods was not different from that of urban areas. In 1978, teachers were overprovided in the rural areas by about 37 percent and in 1983 roughly 39 percent of teachers in the rural areas were inefficiently located.

The foregoing analyses show that at all levels of spatial consideration secondary schools and teachers were inefficiently provided. There were underprovision and overprovision of secondary schools and teachers in 1978 and 1983. The source of inefficiency in the distribution

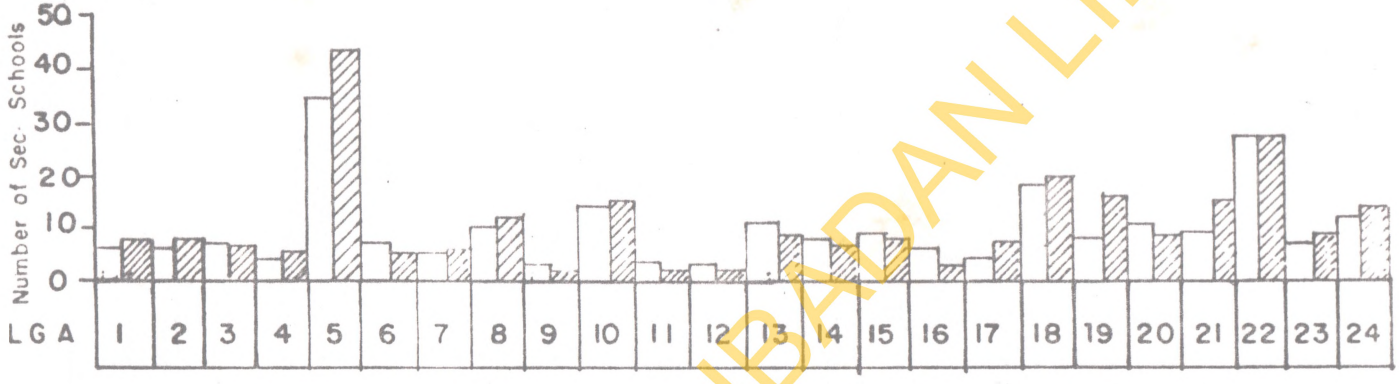


Fig 5·1 : Bar graph showing the actual number and optimum distribution of Secondary Schools among LGAs of Oyo State 1978

KEY

Actual number of Sec. Schools

Optimum number of Sec. Schools

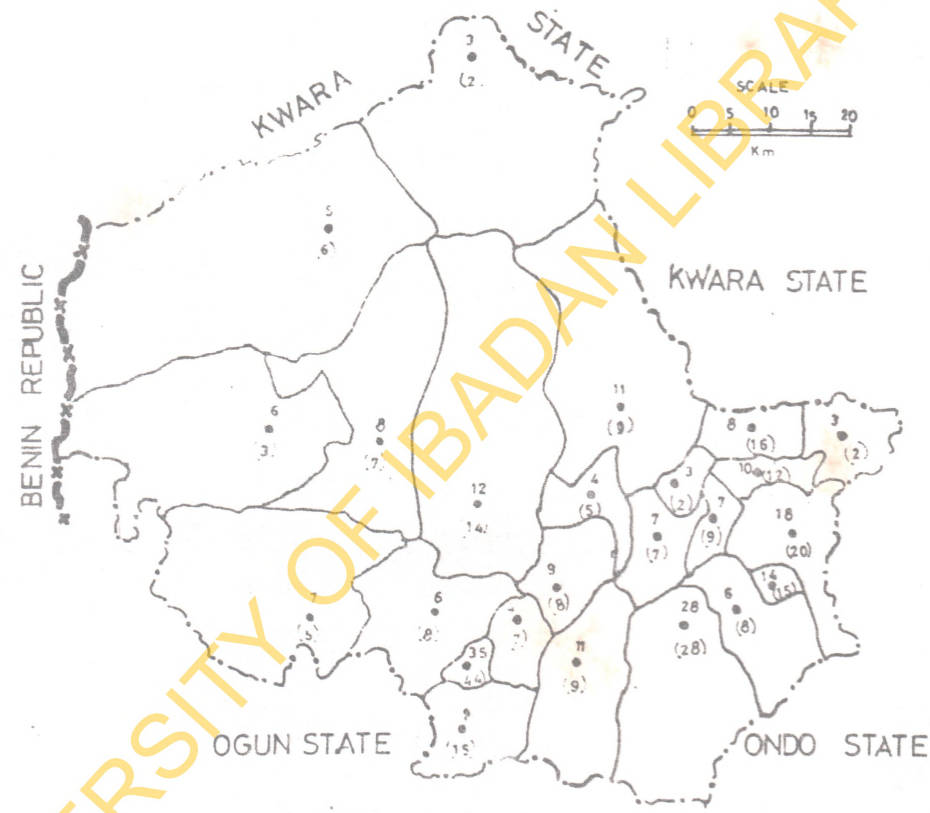


FIG. 5.2: Optimal distribution of secondary schools among L G As of Oyo state, 1978.

NOTE: Figures in brackets are optimum numbers of secondary schools in each L.G.A.
Figures not in brackets are actual numbers of secondary schools, 1978.

of schools and teachers in Oyo State (1978) and (1983) could be associated with poor or lack of educational planning in the provision and distribution of secondary schools and teachers. There is need to de-emphasisze politics of provision and distribution of educational facilities if maximum and good results are envisaged. In order to improve delivery of secondary school education in the State there is need to identify Local government areas that were over-provided and under-provided with secondary school facilities in both 1978 and 1983.

Figures 5.1 and 5.3 show the distributions of secondary schools among Local government areas of Oyo State graphically. The advantage of these graphs lies in the fact that deprived Local government areas and favoured ones can easily be identified. Figures 5 2 and 5.4 show the actual and expected numbers of secondary schools in 1978 and 1983 respectively. Figures 5.1 and 5.2 show that it was in two Local government areas (Ede and Oranmiyan) that secondary schools were efficiently provided in 1978 while in 1983 Ede and Irepo Local government areas were optimally served with secondary schools. The pattern of inefficiency in the distribution of secondary schools are shown in Figures 5.5 to 5.8. Scale method was used to identity degrees of

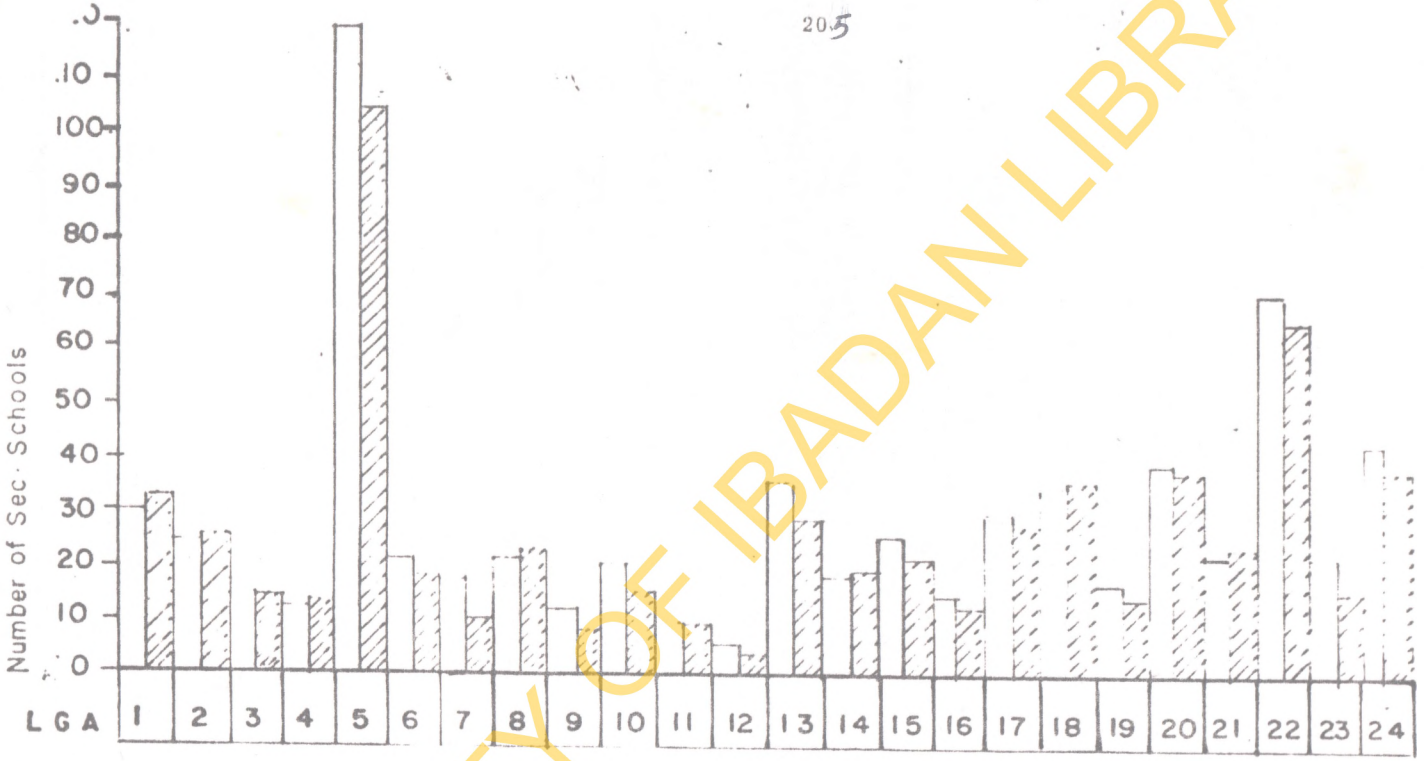


Fig. 5.3: Bar graph showing the actual and optimum distributions of Secondary Schools among LGAs of Oyo State, 1983.

KEY

Actual number of Sec. Schools

Optimum number of Sec. Schools

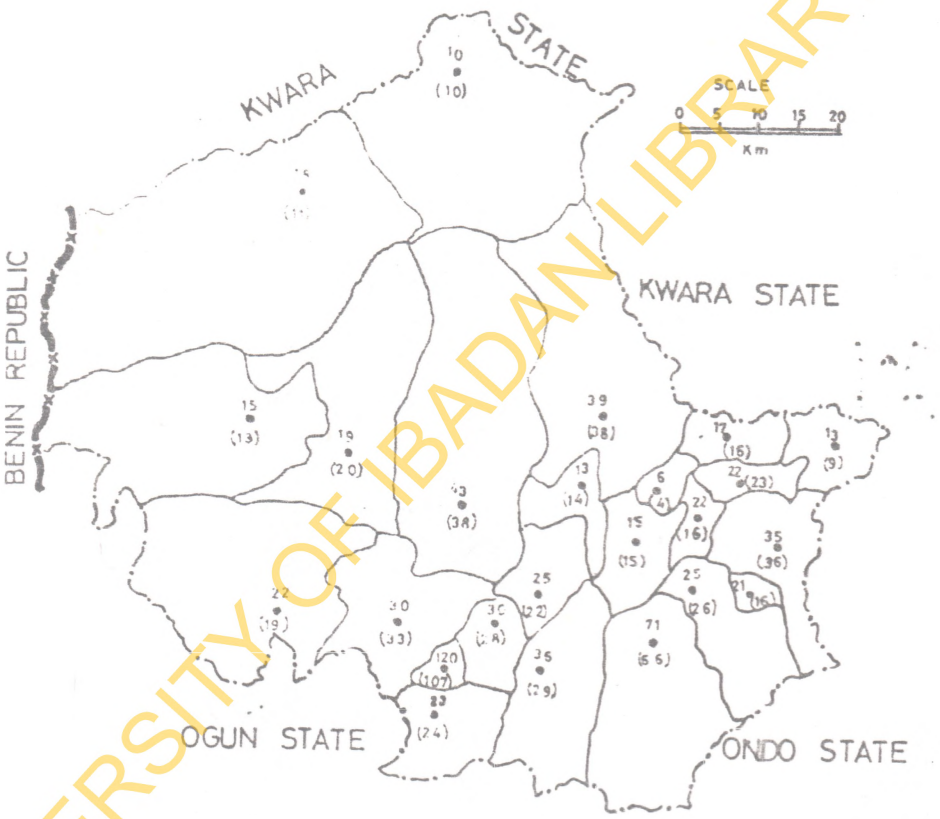
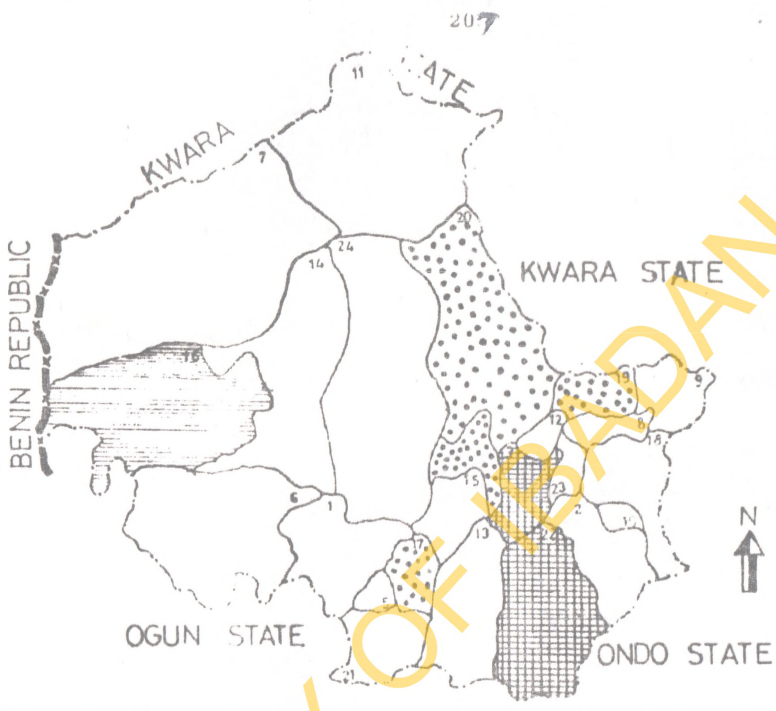


FIG. 5.4: Optimal distributions of secondary schools among L G As of Oyo state, 1983.

NOTE: Figures in bracket are optimum numbers of secondary schools in each L G A.

Figures not in brackets are actual numbers of secondary schools, 1983.



No	L
1	Akinye
2	Atakur
3	Ede
4	Eruigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

FIG.5.5: Optimal surface map showing the levels of efficiency in the allocation of secondary schools among LGAs of Oyo state, 1978.

KEY
- Efficient
- High inefficiency
- Low inefficiency
- Very low inefficiency

International Boundary
State boundary
L G A boundary

Scale: 1:50,000

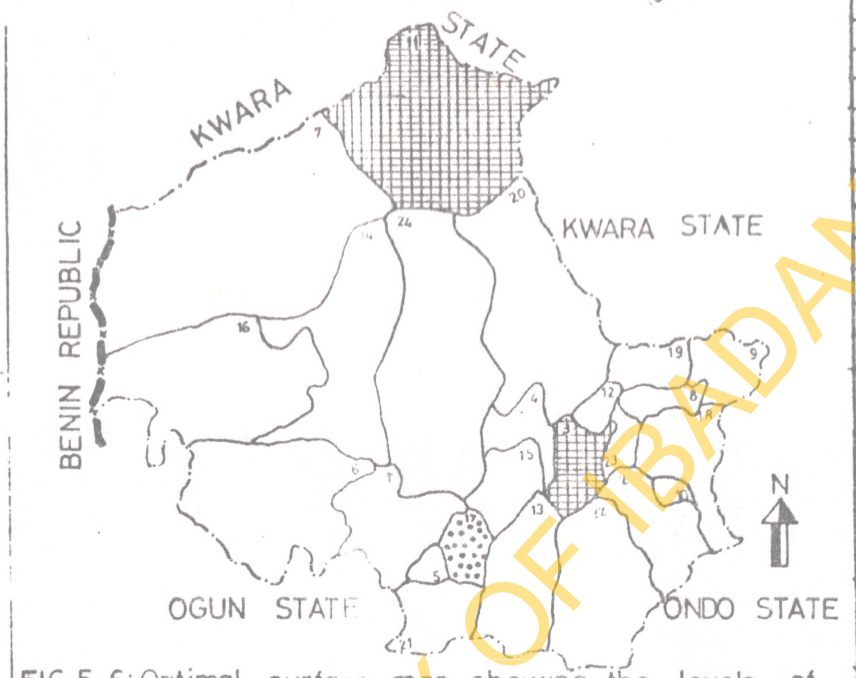


FIG.5.6: Optimal surface map showing the levels of efficiency in the distribution of secondary schls. among L G A. of Oyo state, 1983.

KEY

- Efficient
- High inefficiency
- Very low inefficiency

No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

- International Boundary
- State boundary
- L G A boundary

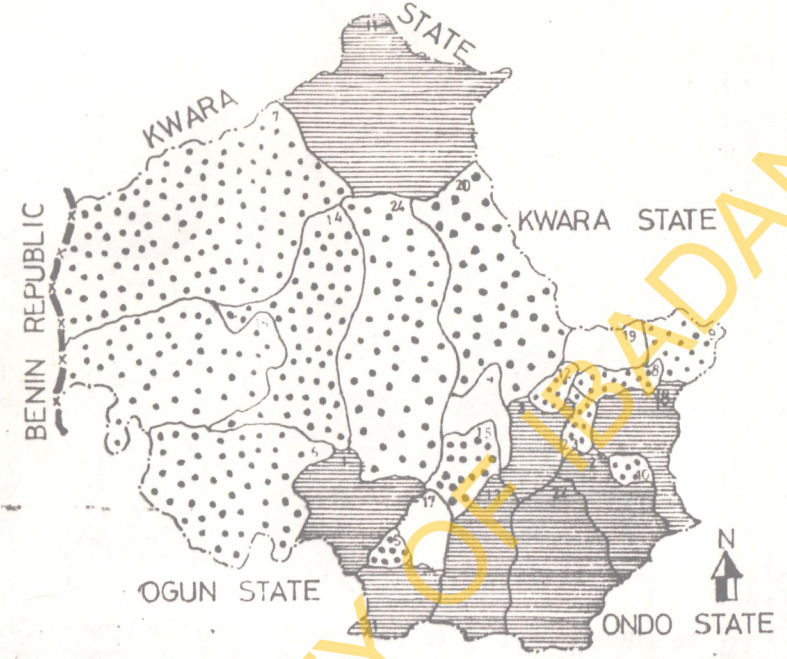
Scale: 1:50,000

inefficiency in the distribution of schools and teachers among Local government areas of Oyo State. Local government area with 100 to 60 percent score has very high inefficiency in the provision of secondary schools or teachers; Local government areas with 59-40 percent and below 40 percent are regarded as recording moderate and low inefficiency respectively. Based on these classification technique the levels of efficiency in the distribution of secondary schools or teachers are identified and mapped in Figures 5.5 to 5.8.

As noted earlier, secondary schooos and teachers were not distributed according to the State government distributional standards hence there was high level of inefficiency in the distribution of the facilities in the State and among Local government areas in both 1978 and 1983. Secondary schools were efficiently provided in Ede and Oranmiyan LGAs in 1978 but they were equally efficiently provided in Ede and Irepo Local government areas in 1983 (See Figure 5.5 and 5.6). The number of Local government areas with inefficient distribution of secondary schools decreased from 5 in 1978 to one 1983. Areas where secondary schools were inefficiently provided cut across rainforest and savannah regions of the State. Inefficiency

in the provision of schools is not limited to certain areas but a general phenomenon in the State. This shows that the provision of secondary schools before and during free education at all levels periods was not rigorously planned.

Figres 5.7 and 5.8 show the inefficiency pattern formed by the provision of secondary school teachers in both 1978 and 1983. Table 5.8 shows that teachers were underprovided in all the 24 Local government areas of Oyo State in 1978 and 1983. However, the number of Local government areas on high inefficiency scale decreases from 13 in 1978 to 1 in 1983 (See Figures 5.7 and 5.8); and those on very low inefficiency scale increased from 3 in 1978 to 13 in 1983. The reasons for the high level of inefficiency in the distribution of teachers among Local government areas of Oyo State could be associated with lack of rigorous educational planning, poor development of urban centres among Local government areas of the State. The inefficient provision of Secondary Schools have far reaching implications on people's accessibility to education. Inefficiency in the distribution of teachers would affect pupil's performance at public examinations and reduce the performance of teachers in their teaching assignments.



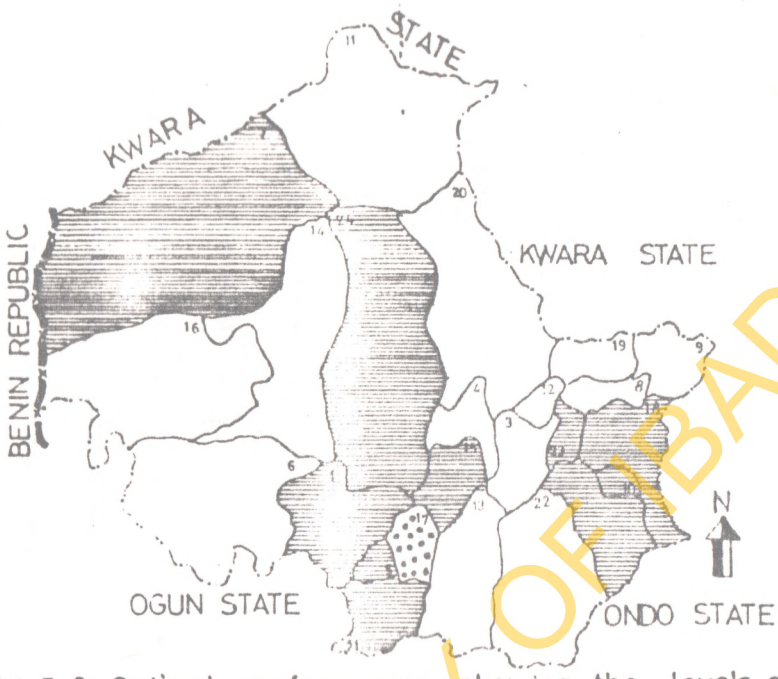
No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary
State boundary
L G A boundary

Scale: 1:50,000

FIG. 5.7: Optimal surface map showing the level of efficiency in the distribution of secondary school teachers among L G As of Oyo state, 1978.

KEY
High inefficiency
Low inefficiency
Very low inefficiency



No	L G A
1	Akinyele
2	Atakunmosa
3	Ede
4	Ejigbo
5	I M G
6	Ibarapa
7	Ifedapo
8	Ifelodun
9	Ila
10	Ilesa
11	Irepo
12	Irepodun
13	Irewole
14	Iseyin
15	Iwo
16	Kajola
17	Lagelu
18	Obokun
19	Odo-otin
20	Ogbomoso
21	Oluyole
22	Oranmiyan
23	Osogbo
24	Oyo

International Boundary

State boundary

L G A boundary

Scale: 1: 50,000

FIG. 5.8: Optimal surface map showing the levels of efficiency in the distribution of secondary school teachers among L G As of Oyo state, 1983.

KEY

High inefficiency

Low inefficiency

Very low inefficiency

In this thesis, it has been noted that inequities in the distribution of schools among Local government areas were not overwhelming whereas inefficiency in the distribution of secondary schools and teachers was real and undoubted. The proliferation of secondary schools and teachers in 1983 has reduced the levels of inequalities and inequities among Local government areas but the mass provision of Secondary schools did not improve the level of optimality in the delivery system. The proliferation of secondary schools in the State (1979-1983) increased the chances of the citizens of the State to secondary school education. This finding confirms Rich's (1979) postulate that in the social service delivery system equity and efficiency cannot be achieved simultaneously. Free education policy has not led to efficiency in the distribution of secondary school resources because its implementation was not based on compliance with distributional principles laid down by Ministry of Education, Ibadan. The party in power in the State was more concerned with pleassing the electorate in order to secure its political control hence it was not interested in efficiency in the distribution of resources or monitoring the spatial impacts and consequences of policy implementation.

CHAPTER SIX

Explanatory Frameworks For The Spatial Variations of Secondary School Facilities In Oyo State

6.1 Introduction

In the last three chapters, it has been shown that there is inequality in the distribution of Secondary School facilities in Oyo State. At all levels of consideration inequality and inequity exist in the distribution of secondary school facilities. Inequality and inequity in the distribution of secondary achool facilities entail differential spatial access to them. In a spatial context welfare geography has been defined as the study of 'who gets what, where and how' (Smith, 1977), and asking how requires the identification and understanding of the structure, and process leading to a particular pattern of who gets what and where. This definition raises the question of explanation. It involves identification of the factors that lead to the distribution in space of the social service of interest. The observed spatial pattern of secondary schools have not evolved by chance, but are the products of social, political, economic and demographic forces acting in termporal and spatial dimensions. There is need to know the origin of the geographical variations in the allocation of secondary schools if insights would be gained into the just or unfair distribution of the

facilities. The main focus of this chapter, therefore, is to identify explanatory factors which underscore the spatial pattern of secondary schools in Oyo State. The objective is to know the level of individual and joint contributions of each factor to the observed variations in the distribution of secondary schools.

6.2 Some Explanatory Factors

The spatial pattern formed by secondary schools in Oyo State are associated with some factors such as population density, number of settlements, settlement density, road density, and so on. In social welfare facility distribution, in developed countries of the world, these identified factors were found to explain patterns of 'consumption goods' (Harvey 1973; Johnson, 1943; Humphrey 1983; Knox 1979a, 1979b).

The ordinary Least Squares method of the Multiple Regression was employed in this study to determine the extent to which the spatial variations of secondary school facilities can be explained by the identified contextual variables or predictor variables. The essence in the use of this technique is that it provides a basis for confirming or refuting some of the inbuilt notions developed in the third hypothesis of the study. The technique is used to identify the major explanatory factors which have

considerable influence on the distribution of secondary school services and which may have shaped the spatial configuration of secondary schools and accessibility to classrooms and teaching staff in the study area.

The multiple regression equation utilised is of the form:

$$Y_n = a+b1x1+b2x2+b3x3+b4x4+b5x5+b6x6+b7x7+b8x8+b9x9+e \quad ...(6)$$

where:

Y_1 = number of secondary schools in each LGA;

Y_2 = number of classrooms;

Y3 = number of teachers;

X1 = total population;

X2 = total urban population;

X3 = degree of urbanization;

X4 = total land area (km^2);

X5 = population density;

X6 = number of settlements;

X7 = settlement density;

X8 = number of urban centres;

X9 = road density;

e = this term includes those aspects of the dependent variables not accounted for by independent variables.

Three regression runs were made with each of the three Ys serving as the dependent variables. The aim, as

noted earlier, was to guage the extent to which these explanatory variables explained the spatial pattern of secondary school facilities and services in Oyo State. The main factor that has determined the choice of the year (1983/84 academic year) and the type of variables used in this study was the focus of the research, data availability. An additional factor in the choice of the variables is theoretical and practical relevance to the Nigerian situation. However, the main hypothesis which will be tested in this chapter is that: total population and urban population are more important in explaining the spatial variation in the distributiions of secondary school facilities in Oyo State.

6.3 Justification for the Choice of Independent Variables

Population constitutes a vital component of the resource base and the development potential of any country. Development is about people and therefore, socio-economic development of an area is closely related to its population characteristics such as size, spatial distribution, its demographic structure and quality. As Afolayan (1978) has observed, the spatial pattern of development in Nigeria today has been determined to a large extent by the existing pattern of population distribution. The pattern of

population distribution itself reflects to an extent, the pattern of distribution of natural resources. During the Third National Development Plan (1975-80) the Federal government of Nigeria frowned at the uneven spatial distribution of educational facilities across the nation and henceforth, it pursued expansion of educational facilities with equity considerations and established educational institutions on a geographical and population basis. Since demographic variants reflect the distribution of social welfare services in Nigeria, it is therefore assumed that they will affect the spatial frequency of secondary schools in Oyo State.

Both the demand and supply functions for secondary schools tend to emphasize the importance of urban locations and underscore the difficulties which a state with defective urban structure will have to grapple with in order to bring this level of services to a large proportion of its youthful population (Mabogunje, 1974). At large scale of spatial considerations Mabogunje (1974) hypothesised that states with few urban centres or low degree of urbanization tend to have relatively few post-primary institutions. The extent to which degree of urbanization and number of urban centres influence the spatial variation of, and spatial accessibility to, secondary school services at a lower

level of spatial aggregation is worthy of examination.

Garner (1967) notes that settlements exist because certain activities can be carried on most efficiently if they are clustered rather than dispersed. Services which are provided in central places are not just for the nodes themselves, but for people living in surrounding tributary areas. In Nigeria, as elsewhere in ex-colonial territories in Africa, schools were established by community efforts since no government can provide all the needs of the people in all places at the same time. To this extent, settlements that are closely located relative to each other with a reasonable size of population will be more able to organize community efforts to establish secondary schools than dispersed settlements with scanty population. There could be association between secondary school services and number of settlements and/or settlement density in Oyo State.

Networks are not simply phenomena, they are also locational factors in their own right (Cox, 1972). Denser communication networks tend to be associated with more developed rather than less developed regions; more populous rather than scantily populated areas. The network is developed presumably in response to some demand for movement of people and goods. Therefore, networks of

communication can exercise a decisive effect on the locational patterns of a whole host of phenomena such as factories, agricultural development, social welfare facilities and services, and so on. There is thus justifiaction to view road density as an attractor variable to secondary school facilities and serivces.

There seems to hold what Rosen (1967) calls 'a form functional law' in the presence or absence of social services among states in Nigeria. It has been shown in many areas of biological and physical research that the form functional law described by the allometric law very frequently holds. The principle of allometric growth specifies how measures made on one part of a system must change proportionately to the growth of the system as a whole (Makinwa, 1981). Nordbeck (1985) shows that the areal of a city is related to its total population by the allometric law, and this suggests that a process of growth over time can be connected mathematically to size in space. There is every tendency therefore, to account for such phenomenon such as "Social Service - areal extent" in Oyo State. There could be a relationship between availability of social welfare services for example, secondary school education, and the total land area (km^2) covered by the spatial units

It has been noted earlier in this thesis that public facilities affect an individual's quality of life and shows the status of a settlement among others. Consequently, secondary school education facilities and services were examined in the context of how their location has been determined without considering the social implicationss of their locations. The issue of determining the explanatory factors for the distribution of secondary schools facilities and services is a problem which is addressed in this section. In this connection nine explanatory variables were identified as shown in Section 6.2. However, this approach, though a way out of the problem, has a number of short-comings. Firstly, the identified explanatory variables are not exhaustive; there are other variables that influence the spatial distribution of secondary school facilities and services in the State. such variables as community development activities, missionary activities, political pressure in terms of access to power and ability to influence decisions, the distribution of wealth, historical inertia, and so on are probably also important. These were ignored because data on them were not available in the form desired. Secondly, it is possible that the choice of the year, 1983/84, which covers the period of

intensive political activity in the State, might influence the outcome of the data.

The main factor that has determined the choice of the year and the variables used in this study is that of data availability and reliability. Nonetheless, these flaws in the choice of the year and variables, notwithstanding, the researcher holds the view that data on explanatory variables are adequate enough for the purpose at hand.

6.4 Statistical Inference in Multiple Regression Analysis

The model used to test the hypotheses is the ordinary Least Sauares method of the Multiple Regression. Multiple Regression analysis is a technique for describing how the variations in one phenomenon are related to variations in two or more phenomena. It is assumed that these other variables do influence or 'determine' the observed variations in the secondary school facilities and services across the Local Government Areas of Oyo State. In addition, the correlation coeffients so obtained summarise the strength of the association of the pair of variables and provide a means of comparing the strength of the relationship between one pair of variables and a different pair. The analysis is divided into two parts. In the first part,

simple linear correlation analysis is used to estimate the gross relationship between each of the secondary school components and explanatory factors considered in pairs.

Nonetheless, as the observed association may have been influenced by other variables operating through the pair being analysed, the second section of the analysis examines the way in which secondary school services are related to the various measures of the explanatory variables. A multivariate analysis allows the consideration of variables not in isolation from one another but jointly operating on the distribution of secondary school services and facilities in Oyo State. In the process secondary school services and facilities in Oyo State. In the process secondary school services and facilities are related to each of the nine explanatory variables taking one at a time in a stepwise manner. Altogether twenty-seven multiple regression equations are generated.

The partial regression coefficient B_1 as shown in equation 6 stands for the expected change in Y, with a change of one unit in X_1 when X_2, X_3 ---- X_j are held constant. Similarly, B_2 stands for the expected change in Y with a unit change in X_2 when X_1 and others are held constant. Most statistics computed from a regression

analysis have well known sampling distributions which allow the researcher to apply statistical inference procedures in determiningconfidence limits for the estimates and in testing hypothesis.

In general, there are three commonly used hypothesis testing procedures. They include (1) the "overall" test for goodness-of-fit of the regression equation (2) the test for specific regression coefficients. This study test for a subset of regression coefficients and (3) the test for a subset of regression coefficients. This study deals with small size samples therefore, the second procedure is employed. The common strategy used in testing the B involves the decomposition of the explained sum of squares into components attributable to each independent variable in the equation. The two basic methods of decomposition are the standard regression method and the hierarchical method.

In the standard regression method, each variable is treated as if it had been added to the regression equation in a separate step after all other variables had been included. The increment in R^2 (or in the explained sum of squares) due to the addition of a given variable is taken as the component or variation attributable to that variable.

In the hierarchical method, variables are added to the regression equation in an order predetermined by the researcher. Variables are added in single steps and the increment in R^2 (or in the explained sum of squares) in each step is taken as the component of variation attributable to the particular variable added on that step. The standard regression method and the hierarchical method yield different increments attributable to the independent variables, and the F-ratio employed in testing the significance of the regression coefficients will slightly be different in form (Kim and Kohout, 1970, 1975). If the standard regression method is used, the tests for B's would reflect only the direct linkages between the independent variable in the hierarchical order and therefore reflects the total influence of each variable

The criterion to be used in making a choice of strategy is whether the correlation among the independent variables is considered to be causal or non-causal. If the observed correlations are non-causal, the standard regression method is commonly used. On the other hand, if the correlations among the independent variables are the results of causal relations, the hierarchical method is used (Kim and Kohout, 1979, 1975).

Table 6.1 Matrix Correlation Between Secondary School Services and Explanatory Variables

	Y_1 (No. of Secondary Schools)	Y_2 (No. of Classrooms)	Y_3 (No. of Teachers)	X_1 (Total Population)	X_2 (Total Urban Population)	X_3 (degree of Urbanization)	X_4 (Total Land Area)	X_5 (Population density)	X_6 (No. of Settlements)	X_7 (Settlement density)	X_8 (No. of Urban Centres)	X_9 (Road density)
Y_1 (No. of Secondary Schools)	1.00000											
Y_2 (No. of Classrooms)	0.97840	1.00000										
Y_3 (No. of Teachers)	0.969927	0.99527	1.00000									
X_1 (Total Population)	0.90137	0.90715	0.89980	1.00000								
X_2 (Total Urban Population)	0.71695	0.82353	0.83024	0.85736	1.00000							
X_3 (Degree of Urbanization)	-0.27377	-0.22380	-0.27528	-0.09827	0.01384	1.00000						
X_4 (Total Land Area, Km^2)	-0.03445	-0.06386	-0.08196	-0.09568	-0.15797	0.31969	1.00000					
X_5 (Population density)	0.20694	0.31546	0.36304	0.33017	0.58622	-0.43765	-0.51784	1.00000				
X_6 (No. of Settlements)	0.11242	-0.00543	-0.05386	0.13824	-0.20778	0.17248	0.37260	-0.61028	1.00000			
X_7 (Settlement density)	-0.26819	-0.30902	-0.30369	-0.11785	-0.21574	-0.25766	-0.61687	0.24376	0.16214	1.00000		
X_8 (No. of Urban Centres	-0.07821	-0.04618	-0.07812	0.16225	0.23913	0.52733	0.02005	0.10359	0.17836	0.15187	1.00000	
X_9 (Road density)	0.59255	0.68653	0.72639	0.58644	0.77048	-0.41798	-0.38824	0.79216	-0.46323	-0.07932	-0.08574	1.00000

Source: Computer Output

In this study the hierarchical method was used to enter the variables in the equation. The order of inclusion was determined by the respective contribution of each variable to the explained variance in the dependent variables. Accordingly, the variable which explained the greatest amount of variance in the dependent variable was entered first in the equation. The next variable was the one which explained the greatest amount of variance in conjunction with the first variable, and so on. In other words, the variable that explained the greatest amount of variance unexplained by the variables already in the equation was entered in the equation at each step.

6.5 Interpretation of Regression Analysis for Spatial Pattern

First the correlation analysis and the coefficients are explained in Table 6.1. Table 6.1 shows the matrix or correlation coefficients between dependent variables (Y1, Y2 and Y3) and independent variables (X1 --- X9). From the table some facts emerge. The first is that total population, urban population and road density are positively correlated with secondary school facilities and services. The coefficients of these variables with secondary schools, classrooms and teachers ranged between

0.59 and 0.91. Population density is also possitively correlated with secondary schools, classrooms and teachers. Nevertheless, the correlation is weak, the highest being o.36. The strong positive relationship between total population (X_1), urban population (X_2), and road density (X_9) with secondary school facilities and services imply that highly populated Local government areas, and Local government areas with high urban population or dense road networks have more secondary school education services than Local government areas with sparse population, low population density or sparse road network. As noted earlier, development of road network is a derived demand hence areas of high population concentration attract social services. Secondary school services are attracted to Local government areas with high population concentration and highly urbanised areas. The low positive correlation betweeen road density and secondary school services seems to suggest that road density was not seriously considered as a factor in the allocation of secondary school services in Oyo State.

Secondly, the relationship between degree of urbanization (X_3), total land area (X_4), settlement density (X_7) and number of urban centres (X_8) with secondary school facilities are not only negatively correlated but low. The

correlation coefficients range between -0.04 and -0.28. This is because these factors have never at any time been considered as distributional factors in the planning scheme of the State government.

Thirdly, number of settlements is positively correlated with the distribution of secondary schools but negatively related to the distribution of classrooms and teaching personnel. This is understandable because the greater the number of settlements the higher will be their capacity to organise community development efforts to establish secondary schools in their locality, especially in the rural setting. Number of classrooms is influenced by enrolments and income of the people. The higher the income of the people the more classrooms they build, and the higher the enrolment, the higher the demand for classroom places. Therefore, number of settlements could not be positively related with number of classrooms. And again, the allocation of teachers to schools is the responsibility of the Central Schools' Board. Teachers are distributed to schools on the basis of enrolment strength and not on the number of settlements. Therefore, the negative relationship between the number of settlements and teachers is not unexpected. Settlement size rather than mere number is no doubt a more important factor in

the distribution of secondary school services. By implication this means that the spatial structure of rural settlements which is the outcome of many socio-economic processes, could limit the capacity of the State government to favour various small and scattered rural settlements in locating public facilities.

By and large, the correlation matrix shows that total population, urban population and road density are positively and strongly correlated with secondary school services, while relationship of secondary school services with population density is also positive but weak. This implies that as these factors increase the number of secondary school services also increases. Degree or urbanization, total land area, settlement density and number of urban centres are negatively correlated with secondary school services.

The analyses of relationships between dependent variables Y_1, Y_2, and Y_3 with the independent variables are linearly related with the independent variables. Four independent variables (total population, urban population, road density and population density) are positively correlated with secondary school facilities and services. Degree of urbanization, total land area,

number ofsettlements, settlement density and number of urban centres are negatively related with number of secondary schools, number of classroom and number of teachers.

However, a useful exercise is to know both the strength and direction of relationship between secondary school services and the explanatory factors. Tables 6.2 to 6.4 reveal these trends. The relationships between secondary school (Y_1) amd total population (X_1), degree of urbanization (X_3), population density (X_5), and road density X_9) are significant at 5% significance level. It can be concluded that the distribution of secondary schools among Local government areas of Oyo State is a function of total population, degree of urbanization, population density and road density. This means that the bigger a settlement node is the more attractive it is to secondary schools. The distribution of secondary school classrooms (X2) is also correlated with the distribution, of road density, population density and urban population. The correlation is highly significant at 5% significance level.

With respect to the relationships between number of teachers (Y_3) on one hand and total population (X_1), road density (X_9), population density (X_5), degree of urbani-

TABLE 6.2: REGRESSION RESULTS: SECONDARY SCHOOLS (Y_1) AND EXPLANATORY VARIABLES

Independent Variables	Multiple R	R^2	R^2 Change	% Variance Explained	F for Equation	t-value	B
X_1(Total Population)	0.90137	0.81246	0.81246	81.246	95.3**	4.29	0.00077
X_8(No of Urban Centres)	0.92963	0.86420	0.05174	5.174	66.8**	0.77	1.14120
X_7(Settlement Density)	0.93804	0.87991	0.01571	1.571	48.8**	0.86	-0.16374
X_3(Degree of Urbanization)	0.94904	0.90067	0.02076	2.076	43.0**	2.17	-0.02454
X_5(Population density)	0.95901	0.91970	0.01903	1.903	41.2**	2.09	-0.00955
X_9(Road Density)	0.96868	0.93833	0.01863	1.863	40.1**	1.93	0.03367
X_6(No. of Settlements)	0.97117	0.94317	0.00484	0.484	37.9**	0.71	-0.10323
X_2(Urban Population)	0.97142	0.94366	0.00049	0.049	31.4**	0.36	-0.00008
X_4(Total Land Area, Km^2)	0.97156	0.94393	0.00026	0.26	26.1**	0.25	-0.00000

Source: Computer Output

**Significant at 1% level

zation (K_3), settlement density (X_7), urban population (X_2) and number of settlements (X_6) on the other hand, significant relationships exist between them at P = 0.01 significance level. Table 6.4 shows the F-values to be significant at 5% probability level. This shows that the higher the total population, urban population, settlement density the more attractive they are to teaching personnel. Degree of urbanization rather than number of urban centres is more important in the distribution of secondary school teachers in the State. This trend is expected because the availability of services is theorectically related to population's needs for them and besides high population concentration increases the ability of the community to support services and facilities, at any one place and its barganing power. Since other social services such as medical, recreational, commercial, and security facilities are attracted to areas of high population, teachers are therefore able and willing to stay and work in such centres.

6.5.1 Regression of Y_1 (Secondary Schools) on independent Variables X_1 ---- X_9

The results of the regression Y_1 (Secondary Schools) on X_1 ---- X_9 are set out in Table 6.2. From Table 6.2, the multiple correlation coefficient (R) is 0.97156 while

the coefficient of determination (R^2) is 0.94393. This means that the nine factors jointly explain 94.39 percent of the variability in secondary schools in Oyo State. From the same Table, the most important variable in explaining the variation in Y_1 is total population (X_1) which accounts for 81.25% of the variation in secondary schools (Y_1). It is followed by variable X_3(degree of urbanisation) which explains 2.08% variance in Y_1. The other two significant variables that determine the spatial patterns formed by secondary schools in Oyo State are population density and road density which respectively explain 1.90% and 1.86% variance in Y_1. The four factors (total population (X_1), degree of urbanisation (X_3), population density (X_5) and road density (X_9) jointly explain 87.09% spatial variation of secondary schools (Y_1) out of which the contribution of total population (X_1) is 81.25%. The contribution of number of urban centres (X_8), settlement density (X_7), number of settlement (X_6), urban population (X_2) and total land area (X_4) is jointly 7.54%. However, the contribution is significant, which is to say that the nine factors do determine the spatial distribution of secondary schools.

As said earlier the nine explanatory variables contribute about 94.39% of the explained variance, there-

TABLE 6.3: Regression Results: Classrooms (Y_2) and Explanatory Variables

Independent Variables	Multiple R	R^2	R^2 Change	% Variance Explained	F - for Equation	t-value	B
X_1 (Total Population)	0.90715	0.82292	0.82292	82.292	102.23**	2.75	0.01053
X_7 (Settlement density)	0.92970	0.86434	0.04143	4.143	66.90**	0.76	-3.24130.
X_3 (Degree of Urbanization)	0.95061	0.90365	0.08931	8.931	62.50**	1.98	-0.40491
X_9 (Road density)	0.95683	0.91553	0.01188	1.188	51.40**	1.63	0.63699
X_5 (Population density)	0.96556	0.93230	0.01677	1.677	49.50**	1.99	-0.20450
X_2 (Urban Population)	0.96797	0.93697	0.00467	0.467	42.10**	1.13	0.00 72
X_6 (No. of Settlements)	0.96970	0.94031	0.00334	0.334	36.00**	0.64	-2.06400
X_8 (No. of Urban Centres)	0.97009	0.94108	0.00077	0.077	28.90**	0.41	13.41912
X_4 (Total Land Area, Km^2)	0.97028	0.94144	0.00036	0.036	25.00**	0.29	-0.00012

Source: Computer Outp

* Significant at the level

** Significant at the level

fore, a small amount 5.37% variance was unaccounted for by the nine explanatory variables. Thus one can logically argue that more variables especially community development effort, historical inertia, the distribution of wealth, political patronage in terms of access to power and ability to influence decisions, and so on, need be incorporated in order to fully account for variations in the spatial pattern of secondary schools in Oyo State. Okafor (1982) noted that a community's share of government patronage depends, to some extent, on the number of prominent or important politicians from the community and on where the community's political sympathy lies. If the leading political figures in a community belong to the party in power, then their chances of attracting government projects are usually very good, and vice versa. Harvey, (1973) equally said that the success of any group in obtaining a just share of public goods and benefits that are allocated spatially through the political planning process depends partly on its political bargaining strength. Future research needs to focus on the contribution of these variables to the spatial pattern of social services in the third world countries.

TABLE 6.6: Regression Results: Number of Teachers (Y_3) and Explanatory Variables

Independent Variables	Multiple R	R^2	R^2 Change	% Variance Explained	F - for Equation	t-value	B
X_1 (Total Population)	0.89980	0.90963	0.80963	80.963	92.5**	3.16	0.01584
X_9 (Road density)	0.93264	0.86982	0.06019	6.019	78.19**	2.21	1.09157
X_5 (Population density)	0.95309	0.90838	0.03856	3.856	66.04**	2.59	-0.32691
X_3 (Degree of Urbanization)	0.96067	0.92289	0.01451	1.451	56.84**	2.72	-0.90482
X_7 (Settlement density)	0.97250	0.94576	0.02287	2.287	62.70**	1.04	-3.75645
X_2 (Urban Population)	0.97508	0.95078	0.00502	0.502	56.70**	1.42	0.00944
X_6 (No. of Settlements)	0.97705	0.95579	0.00501	0.501	49.40**	1.37	-4.75582
X_8 (No. of Urban Centres)	0.97792	0.95633	0.00054	0.054	41.00**	0.43	18.63727

Source: Computer output

* Significant at the 5% level

** Significant at the 1% level

6.5.2 Regression of Y_2 (Secondary School Classrooms) On Independent Variables X_1 --- X_9

The spatial pattern of accessibility formed by the distribution of classrooms closely follow that of secondary schools. Table 6.3 shows the regression of classrooms on the explanatory variables. The Table shows that nine factors significantly determine the spatial pattern of classrooms distribution among Local government areas of the State. The coefficients of determination (R^2) show that total population, degree of urbanization, road density, population density and urban population contributed 82.29%, 8.93%, 1.19%, 1.68% and 0.45% to the explained variance respectively. The nine explanatory factors thus, contributed 99.15% explained variance leaving 0.85% to be accounted for by other variables that have entered the data. Again, the contribution of total pppulation (82.29% was the highest closely followed by degree or urbanization (8.93%).

6.5.3 Regression of Y_3 (Teachers) on Independent Variables X_1 ---- X_9

Table 6.4 shows the regression of number of teachers (Y_3) on the explanatory variables. A few facts emerge from the Table. One, all factors significantly determine

the allocation of teaching personnel in the study area. Two, total population explains 80.96% of variance as against 81.25% and 82.29% of secondary schools and classrooms respectively. Three, the nine explanatory variables jointly accounted for 95.63% of the explained variance in the distribution of teachers. Four, nine factors significantly determine variations in the distribution of teaching personnel in the State. The nine variables accounted for 95.58% of the explained variance. Five, in the distributional planning of secondary school teachers, special note ought to be taken ot total population, road density, population density, degree of urbanization, and settlement density. This is because, the analyses above show that settlement size and degree of nucleation of settlements or settlement density are more important than mere number of settlements in determining the distribution of secondary schools services such as teachers.

In conclusion, the analyses clearly show that total population, urban population and road density are functionally related to the spatial variations in accessibility to secondary school facilities; while total population predominantly determines the distribution of secondary school facilities among Local government areas of Oyo State.

However, the analysis shows that the identified nine explanatory factors could not account for the distribution of secondary school facilities in Oyo State. Need arises to identify additional variables to explain the distribution of the facilities. This is because service location patterns are the result of a series of facility location decisions made at different historical contexts. The identified nine explanatory variables can, however, be used to explain and plan the spatial distribution of secondary schools among Local government areas of Oyo State.

CHAPTER SEVEN

SUMMARY AND CONCLUSIONS

The main focus of this study is to describe and explain spatial variations in accessibility to secondary school facilities among a set of settlements of a a region in a typical developing country of the world. The objectives are to: examine the implications of free secondary school education policy (1979-1983) and mass provision of secondary school on accessibility of the people to secondary school services; determine the extent to which secondary school services were provided among Local government areas of Oyo State in relation to population or needs; examine whether mass provision of schools has improved distributional efficiency of the schools over the years and finally, to find out the major factors that influence the distribution of schools in the study area. The study has revealed some findings.

The findings of the study include: One, with increasing number of secondary schools (1979-1983) there is increase in the accessibility of settlements and/or population to Secondary School facilities. Generally speaking therefore, average access opportunity to secondary schools and teaching personnel improved by 140.51 and 108.80 percent respectively over the years. Total popula-

tion without secondary schools and total weighted distance decreased by 54.23% and 69.24% respectively. Two, the distribution of secondary school in 1978 and 1983 were closely related to population. The coefficients of correlation between population and secondary schools in 1978 ($r = 0.93$) and in 1983 ($r = 0.94$) corroborate this postulate. However, the correlation coefficients between enrolments and teachers were high in 1978 but low in 1983. Therefore, there was growth in the number of secondary schools in the State but there was no development. Large numbers of secondary schools in all the 24 Local government areas are meaningless without adequate trained teaching personnel to teach pupils. Territorial justice cannot be said to exist with regard to the allocation of secondary school teachers in 1983 and among Local government areas of Oyo State.

Three, mass provision of secondary schools has spread the facilities among urban and rural areas in 1983 more than ever before. In other words, proliferation of secondary schools in Oyo State (1983) has ensured a wider geographical dispersal of secondary schools among LGAs, urban and rural areas of Oyo State. Secondary school educational policy (1979-1983) has increased the spread out of secondary schools among urban centres by 13.49%

and by the same amount among rural areas in 1983. The localization of teachers in the urban centres (1978) was reduced by 10% in 1983; while access opportunity of rural population to teachers improved by 10.10%. Mass provision of secondary schools reduced the rate of deprivation of rural areas in the allocation of secondary school facilities in 1983. A situation of territorial justice between LGAs, however, does not necessarily imply a situation of social justice amongst the individuals within each of the 24 LGAs. This implies that territorial justice is not a sufficient condition for achieving social justice, but it is nevertheless a necessary condition. Four, the study also revealed the fact that efficiency in the distribution of secondary school facilities could not be improved by sheer establishment of more and more schools among Local government areas. Although the objective of the State government was to distribute secondary schools among LGAs of Oyo State in order to enhance equity and efficiency yet inefficiency is still much apparent in the State. The government policy on secondary school education has aided the equitable distribution of schools among LGAs but not necessarily efficiency criterion. Inefficiency in the distribution of schools and teaching personnel (1979-1983) could be

a reflection of poor or total lack of planning in the distribution of schools. Decentralization of secondary schools may be less efficient, but it is more equitable in the sense that the levels of differnces among LGAs, regions and zones have been reduced.

Five, Local government areas with high population concentration, and more urbanized ones have larger shares of secondary school facilities than the predominantly rural ones. Total population is, in fact, an important distributional criterion in the State. In spite of the stated policy of one and a half classrooms to one teacher, enrolments in schools is not an important distributional criterion. By implication, therefore, distribution of teachers is not related to enrolments in schools. The higher the population of a node or an area the more attractive it is to secondary schools. Conversely, the lower the population of a settlement the more unattractive it is to secondary school facilities.

There are theoretical and practical implications of the findings to all developing countries of the world. Secondary schools are provided at higher order central places and they demand a minimum threshold population that justifies the allocation of scarce financial and human resources to their establishment and maintenance.

Developing countries of the world have a sizeable proportion of their populations in rural areas and they also have defective urban structure. Settlements are scanty and scattered and far in between. The pattern of infrastructural investments favours State capitals, adminstrative centres and urban nodes, the creation of urban centres or planning zones which are groups of LGAs is therefore seen as a means of tackling problems of distributional inequalities, inefficiency and inequities.

In remote areas of the third world countries, it is the rural population who unfortunately experience the least favourable distribution, not only of secondary schools, but also of other developmental infrastructures, and who must bear the considerable costs of overcoming poor accessibility to secondary school education resources or go without. Moreover, in terms of population and settlement patterns the rural areas are most likely to loose in the competition for society's scarce resources. They are isolated and far away from the seats of power, and so it is more difficult to organise collective social action to lobby for the redress of inequalities and inequities of social services. Rural settlements remain less visible and more easily ignored, and their peripheral representation can only be overcome at greater costs to

themselves mostly by integrating isolated and scattered settlements which they occupy to form integrated 'aggro-villes'.

To develop visible and efficient social services in the rural areas, developing countries should plan and create second or third order urban centres within which social services of all types and categories should be located. The creation of such urban centres will make social services to be accessible to rural population thereby improving their living standards, stem rural-urban exodus of population and ensure regular supply of consumers of services. In the case of secondary school facilities adequate number of primary schools should be located within the neighbourhood of planned rural urban centres so that rural secondary schools will be assured of regular consumers. Experience has shown that urban primary school leavers would not be pleased to attend rural-based secondary schools, but primary school leavers in the rural areas would be pleased, for many reasons, to attend schools located in their rural environments.

An objective aimed at the attainment of national economic and social equity on settlement of national economic and social equity on settlement or Local

government area basis, may overstretch national resources and frustrate future planning efforts. Such an objective may improve access to national resources by ensuring a wider geographical dispersal of social and economic infrastructures or may be politically and socially desirable but economically unfeasible. The current distributional pattern of income, economic and social opportunities in the Third World countries does not appear to be politically, socially and economically desirable. There is need to identify planning zones which are made up of LGAs or States that cut across jurisdictional boundaries as target areas for development. States or LGAs that have attained the same development level should be grouped. States or LGAs with different levels of economic development grouped together as a planning zone will aggravate economic destitution in the less developed states because of backwash effects of developed states or LGAs.

A government policy that focuses solely on the provision of more and more social services without a rational distributional or locaional planning is bound, on the long run, to lead to the founding of secondary schools, for example, that may not be viable and also to unnecessary increase in the cost of burden of education at this level. If less developed countries would take

improvement of human living standards seriously, social welfare components such as health and education, for example, should not be made an object of political horse-, trading rather they should be provided and made accessible to all irrespective of people's political sympathy. National governments of Third World countries should make the planning, provision, distribution and financing of health and education services their sole responsibility rather than sharing their delivery system with local or state governments. If the services are delivered at this level their planning provision and distribution will be based on equity, efficiency and equality considerations. The problems posed by frontier states, LGAs or settlements will then be tackled through establishment of social services with catchment areas that cut across nations, States or LGAs. Governments of the Third World countries, considering their financial, socio-cultural circumstances, population and settlement characteristics, should pursue a policy of compromise options. In this regard, welfare and efficiency goals are to be blended when it comes to actual provision, distribution and location of social services. To insist on outright welfare goal in the face of dwindling financial resources will make other sectors of the economy to suffer or totally neglected; and to

insist on efficiency goal will further accentuate polarised economic and social development between urban and rural areas of their respective countries.

Third World government policies on provision of Social Welfare components have been 'incrementalist rather than resitributive' thus leading to areas of great need not necessarily getting more than areas of less need. Research on government policies in the developing parts of the world should concentrate on evaluating government policies in view of the realities of the situation in each country so as to guide planners in their choice of planning strategy. Although mass provision of education has reoccurred several times in the planning schemes of most developing countries yet little has been done so far to assess the impact of proliferation of educationa facilities on the spatial structure of the public environment. Future research on social welfare facility provision should focus on selecting the best locations from among the many that are possible for the existing social services, for example, Secondary Schools in order to minimize the cost of service provision. Knowledge of the optimum numbers of secondary schools in a spatial unit is not enough, there is need to find out the efficient locations of secondary school(s) among settlements. It is important to note that there is

a subtle but important difference between an increase in the quantity and geographical spread of secondary schools and their equitable distribution. There is need for integrated approach to the study of spatial inequality in social well-being of the Third World countries in order to draw a comprehensive picture of inequalities in well-being of any country. Need arises to find the spatial pattern formed by other social welfare indicators the likes of health; incomes and employment; recreation and leisure and so on. Since less than 100% variations are explained by the identified explanatory variables future research dimensions should be focussed on the the effect of self-help community efforts, missionary activities, the distribution of wealth or income and political patronage in explaining spatial variations in accessibility to secondary school education in the ex-colonial territories of Africa.

REFERENCES

Abler, R.J.S. Adams and Gould, P. (1977): Spatial Organisation - the geographers view of the world (Prentice-Hall, London).

Abumere, S.I. (1984): "The Future Population of The Federal Capital Territory Abuja" Nigerian Journal of Economic and Social Studies. 287-313

_____ (1985): "Regional Development Policy Options: a case study of Bendel State, Nigeria" in J. O. Abiodun, ed. Urban and Regional Planning Problems in Nigeria (University of Ife Press). pp 93-120.

Abrams, M. (1973): Subjective Social Indicators, Social Trends (4) 35. pp 35-49.

Aboyade, O. ed. (1978): The National Account of Nigeria, 1973-1975. (Federal Ministry of National Planning Lagos).

Adejuyigbe, O. (1971): 'Location of social Service Centres in Western Nigeria, The Case of Medical Facilities" (Mimeo Dept. of Geography, University of Ife, Ile-Ife).

Adeyemo, A.M. (1979): The Take-over of Secondary Schools and its effects on academic performance - A case study of St. Bernadines Grammar School, Oyo (P.G.D.E. Thesis, Institute of Education , A.B.U., Zaria, 1979).

Adrian, C. (1983): Centralised Service Provision: an examination of the facts. Australian Geographical Studies, 1983 (21) 251-258).

Afolayan, A.A. (1978): 'Population' in J.S. Oguntoyinbo; O.O. Areola and M.O. Filani, eds. (1978): A Geography of Nigerian Development (Heineman, Ibadan).

Alonso, W. (1972): "Equity and Its Relation to Efficiency in Urbanization". University of California, Berkeley Centre for Planning and Development Research, Working Paper No. 78.

Annunsionwu, E.C. (1980): 'Regional inequalities in Nigeria during the Military Era: Problems and Imbalance in Income, Social and Economic Opportunities; in The Nigerian Economy under the Military. (Proceedings of Annual Conference of NES, 1980, 89-134.

Atkinson, A.B. (1975): The Economics of Inequality. (Clarendon Press, Oxford).

_____ (1970): 'On Measurement of Inequality'. Journal of Economic Theory (2) 244-263.

Ayeni, M.A.O. (1978): 'Patterns, Processes and Problems of Urban Development' in J.S. Oguntoyinbo et. al (eds) 1978 Op. Cit. pp 156-174.

Ayeni, B.; Rushton, G.; McNulty, M.L. (1985): "Improving the Accessibility of Health Care Delivery Facilities in Rural Areas of Ogun State". Nigerian Journal of Economic and Social Studies, Vol. 27 No. 3, 345-269

_____ (1987): 'Access, Equity and Efficiency in the location of rural public services" in E.E. Okpara and G.A. Wigwe eds. (1987). Resource Mobilization for Rural Development (Book of Abstract). School of Environmental Studies Imo State University, Okigwe.

Bach, L. (1981): 'The Problem of aggregation and distance for analysis of accessibility and access opportunity in location - allocation Models' Environment and Planning A, 1981. Vol 13, 955-976.

Badcock, B.A. (1977): 'Educational attainment and participation Rates in Sydney'. Australian Geographers (13) 325-331.

Barclay, G.W. (1958): Techniques of Population Analysis (John Wiley, New York).

Berry. B.J.L. and Garrison, W.L. (1958): 'Functional Bases of the Central Place Hierarchy. Economic Geography Vol. 34 145-154.

_____ (1967): Geography of Market Centres and Retail Distribution. Eglewood Cliffs: Prentice-Hall.

Black, J. (1977): Public convenience. (Canberra, B.N.V. Press).

Boulding, K. (1971): "The Boundaries of Social Policy" Social Work. 12 (1971) p. 7.

Burns, L.D. (1978): Transportation, Temporal and Spatial Components of Accessibility. (Lexington Books, Lexington, Massachusetts).

Burnett, P. (1973): "The Dimension of Alternatives in Spatial Choice Processes". Geographical Analysis 5, pp 53-68.

Bruton, M.J. ed. (1974): The Spirit and Purpose of Planning. (Hutchinson, London).

Castells, M. (1975): 'Advanced Capitalism, Collective Consumption and Urban Contradictions; in L. Lindberg et. al.; Stress and Contradiction in Modern Capitalism. Massachusetts, Lexington Book, 175-197.

Chorley, R.J. and P. Haggett, eds. (1967): Socio-Economic Models in Geography (Methuen, London).

Christallar, W. (1986): Central Places in Western Germany. Trans. By C.W. Baskings (Englewood Cliffs, New Jersey).

Clark, P.J. and Evans, F.C. (1954): 'Distance to Nearest-Neighbour as a Measure of Relationships in Populations'. Ecology 35, 445-53.

Cole, K.J. and A.C. Gatrell (1986): 'Public Libraries in Stafford: A geographical analysis of provision and access'. Environment and Planning A. 1986 Vol. 18 253-268.

Combs, P.K. and J. Hallak (1972): 'The Determinants of Educational Costs'. in Managing Educational Costs (London, O.U.P.) 89-92.

Coutler, P. (1980): 'Measuring the inequity of Urban Public Serivces: A Methodological discussion with applications'. Policy Studies Journal (8) 612-706.

Cox, K.R. (1972): Man, Location and Behaviour - An Introduction to Human Geography (John Wiley, London).

Curry, L. (1964): 'The random Spatial Economy: An exploration on settlement theory'. Ann. Association of American Geographers (54) 138-146.

_____ (1972): 'A Spatial Analysis of Gravity Flows'. Regional Studies, Vol., 131-147.

Curry, L. Griffith, D., and E.S. Sheppart (1975): 'Those Gravity Parameters again'. Regional Studies 9, 289-296.

_____ (1962): 'Analysis of Central Place and Point Patterns by a nearest-neighbour method' in Norbog, K. (ed.) I.G.U. Symposium in Urban Geography (1962) Lund.

Davies, B. (1968): Social Needs and Resources In Local Services (Joseph, London).

Dear, M. (1978): 'Planning for Mental Health Care: a reconsideration of Public facility location Theory'. International Regional Science Review (3) 93-111.

DeJong, G.A. and F.F. Rutten (1983): 'Justice and Health for all' Social Science and Medicine, (17) 1085-95

Duncan, S.I. (1974): 'Cosmetic Planning or Social Engineering'. Area 6, (4) 259-270.

Ebdon, D. (1977): Statistics in Geography (Basil Blackwell, England).

Egunjobi, T. O. (1977): Implications of Health Resources for Regional Plannings: The Example of the Oyo Health Zone in Oyo State. (Unpublished Ph.D. Thesis, University of Nottingham, England).

Everley, D. (1975): 'Regional Development and Environmental Planning' E. Graven (ed.) Regional Development and Social Policy (Macmillan, London).

Fafunwa, A.B. (1974): History of Education in Nigeria (George Allen and Unwin, London).

Feldman, S. and Gonen, A. (1975):"The Spatio-Temporal Pricing of some Urban Services, Urban Ecology, Equity and Efficiency". Environment and Planning. Vol. 7 315-323.

Filani, M.O. and J.O.C. Onyemelukwe (1977): A Geographical Analysis of Development Planning Probllems in developing countries: The Nigerian Example. (University of Ibadan, Department of Geography, Memeo).

Filani, M.O. (1981): "The need to Modify Centre - Down Development Planning" in W,B. Stohr and D.R. Frasser - Taylor, eds. Development from Above or Below?

Gana, J. A. (1978): 'Rural Settlements' in J.S. Oguntoyinbo, et. al. eds., 1978, op. cit. pp 138-155.

Galper, J. (1975): The Politics of Social Services. Englewood Cliffs, New Jersey: Prentice-Hall.

Garner, B. J. (1967): "Models of Urban Geography and Settlement Location" in Chorley, R.J. and P. Haggett eds. 1967. op. cit. pp 243-287.

Getis, A. (1964): 'Temporal Analysis of land use patterns with the use of nearest-neighbour and quadrant methods'. Annals of Association of American Geographers (54) 391-399.

Gunwardena, K.A. (1964): Service Centres in souther Ceylon. University of Cambridge Ph.D. Thesis. Quoted from Hagget, P. et. al. 1977 op. cit.

Gillespe D. and S. Marten (1978) 'Assessing Service Accessibility'. Administration in Social Work (2) 183-197.

Godlunds, S. (1958) Population, Regional Hospitals, Transport Facilities and Regions: Planning the Location of Regional Hospitals in Sweden, Lundi: Gleerup, 196). Lund Studies in Geography, Series B, Human Geography No. 21.

_____ (1973): Planning the Location of Schools; Ankole, Uganda(IIEP, UNESCO, Paris).

_____ (1974): 'Movements of School Children and Provision of Secondary Schools in Uganda'. East African Geographical Review April, 1974, No. 12, 65-76.

Goulet, Dennis (1971): The Cruel Choice: A New Concept In The Theory of Development (New York; Atheneum).

Greig-Smith, P. (1964): Quantitative Plant Ecology (London).

Haggett, P.A.D. Cliff and A. Frey (1977): Locational Analysis in Human Geography, 2nd Edition (Arnole).

Hakimi, S.L. (1965): 'Optimum Distribution of Switching Centres in a communication Network and Some Related Graph Theoretic Problems". Operations Research, Vol. 13(3), 462-475.

Hallak, J. (1969): The Analysis of Educational costs and Expenditure (IIEP, Paris).

Hammond, R. and P. S. McCullaph (1978): Quantitative Techniques in Geography - An Introduction 2nd Edition. (Clarendon Press, Oxgord).

Hart, J.J. (1971): 'The Inverse Care Law' Lancet I, 405-412.

Hauger, D. (1972): Some Problems in the Use of Stepwise Regression Techniques in Geographicl Research'. Paper submitted to the Anglo-Romanian Geographical Seminar on Modern Methods and Techniques in Geographical Study (RSG) London, 14-15, September.

Harvey, D. (1968): Some Methodological Problems in the use of Neyman Type A and negative binomial probability distributions for the analysis of spatial point patterns'. Institute of British Geographers, publications, 44, 85-95.

_____ (1973): Explanation in Geography (London, Edward Arnold).

_____ (1973): Social Justice and the City (London, Edward Arnold).

_____ (1978): 'On Countering the Marxian Myth-Chicago Style'. Comparative Urban Research 6, 28-45

Harworth, L. (1968): 'Deprivation and the Good City', W. Bloomberg and J.S. Schmandt, eds. "Power, Poverty and Urban Policy". Urban Affairs Annual Review 2, Sage Publications. Beverley Hills, Calif. 27-47.

Hodder, B.W. and U.I. Ukwu (1969): Markets in West Africa. (Ibadan University Press).

Hodge, D. and Gattrell, A. (1976): 'Spatial Constraint and the Location of Urban Public Facilities'. Environment and Planning A 8, 215-30.

Holm, S. (1970): 'Accessibility to National Dental Service in the Province of Norbotten in 1950 and 1965'. Geografiska Annaler 1970. Vol. 52B, 141-152.

Humphreys, J.S. (1985): 'A Political Economy Approach to the allocation of Queensland'. Australian Geographical Studies, Journal of Institute of Australian Geographers Vol. 1, 23(2) October 1985; 222-240

ILO (1976): 'Employment, Growth and Basic Needs: A one world Problem (Geneva, ILO).

Ingram, D.R. (1971): 'The concept of Accessibility: A Search for Operational Form'. Regional Studies, Vol. 5 101-107.

Isard, W. (1986): Location and Space Economy: (New York, John Wiley).

Iyun, B.F. (1978): Spatial Analysis of Health Care Delivery In Ibadan City. (Unpublished Ph.D. Thesis, University of Ghana, Legon).

Johnson, C.S. (1943): Patterns of Negro Segregation. (Harper and Brothers, New York).

Johnston, R.J. (1966): 'Central Places and the settlement patterns'. Annals of the Association of American Geographers Vol. 56 (3) 1966, 541-549.

_____ (1970): 'Grouping and Regionalising: Some Methodological and Technical Observation' Economic Geography, Vol. 46. Supplement Pages 293-305.

_____ (1968): "Choice in Classification". A.A.A.G 58, 575-589.

Jones, K. and A. Kirby (1980): 'Provision' and Wellbeing: An agenda for Public Resources: Environment and Planning A. 14 September, 1980, 297-310.

Kane, R. (1969): 'Determinants of Health Care Priorities and Expectations among rural consumers'. Health Services Research 4, 142-151.

Kendall, M.G. and P.A.P. Moran (1963): Geometrical Problems (London).

Kendall, M.G. (1966): 'Distribution and Classification' Proceedings at the Symposium on the Multivariate Analysis. Academic Press. New York

King, L.J. (1969): Statistical Analysis in Geography. (Prentice-Hall, New Jersey).

_____ (1962): 'A Quantitative Expression of the Pattern of Urban Settlements in Selected Areas of the United States". Tijdschrift Voor Economche en Sociale Geografie 53, 1-7, Quoted from _ Haggett et. al. 1977, Op. Cit.

Kim, P. and Kohout, M.S. (1970): 'Multiple Regression Analysis: Subprogram regression'. Norman, H. et. al. (ed.), Statistical Package for the social Sciences (SPSS) (2nd ed.) McGraw-Hill Book Company New York.

Kizra, L. and Serman, K. (1979): Distribution Rules and Differential Location of Public Services in Urban Delhi Duh).

Knox, P.L. (1979a): 'The accessibility of primary care to urban patients: a geographical analysis', Journal of the Royal College of General Practitioners, March 1979, 160-168.

_____ (1979b): 'Medical Deprivation, Area Deprivation and Public Policy' Social Science and Medicine, Vol. 13, D. 111-121

Lea, A.C. (1979): 'Welfare Theory, Public goods and Public Facility Location'. Geographic Analysis, Vol. II, 217-239.

_____ (1981): 'Public Facility Location Model and the Theory of Impure Public goods'. Sistemi Urbani Vol. 3. 345-390.

Lee, Eddy (1981): 'Basic-Needs Strategies: A frustrated Response to Development from Below' in W.R. Sohr and D.R.F Taylor eds. 1981 op. cit. pp 107-122.

Limberry, R. (1976): 'Equality, Public Policy and Public Services: The underclass hypothesis and the limits to equality'. Policy and Politics, 1976, (4)67-84/

_____ (1977): Equality and Urban Policy. (Beverly Hills, Califf, Sage Publications).

Losch, A. (1954): The Economics of Location. Trans. by W.H. Wolglom with the assistance of W.F. Stoper, (New Haven, Yale University).

Mabogunje, A.L. (1974): Cities and Social Order. Inaugural Lecture, University of Ibadan, Ibadan (I.U.P.).

_____ (1976): 'The Population Census of Nigeria, 1973, in J.T. Coppock and W.R.D. Sewell eds. (1976), Spatial Dimension of Public Policy (Pergamon Press, Oxford).

_____ (1978): On Developing and Development (Ibadan University Press).

_____ (1980): The Development Process: A Spatial Perspective (Hutchinson, London).

_____ (1868): Urbanization in Nigeria (London University Press.

Makinwa, P.K. (1981): Internal Migration and Rural Development in Nigeria Lessons from Bendel State Heinemann, Ibadan.

Maro, P. S. and Mlay, W.F.I. (1977): "Decentralisation and Spatial Equity in Tanzania: A Proposal for Assessing Achievements'. East African Geographical Review No. 15, 33-42.

Maos, O.J. (1983): "The Efficiency of Services in Dispersed and Concentrated Land Settlement: A Comparison". Geografiska Annalar, Vol. 65B No. 1983, 47-54

McAllister, D.M. (1976): "Equity and Efficiency in Public Facility Location". Geographical Analysis Vol. 8, 47-63.

McLafferty, S. and Ghosh, A. (1982): "Issues in Measuring Differential Access to Public Serivces". Urban Studies, Vol. 19, 383-389.

McLafferty, S. (1982): "Urban Structure and Geographical Access to Public Service" Annals of the Association American Geographers. 72(3), 347-354.

McGuire, M.C. and Garn, H.A. (1969): "The Integration of Equity and Efficiency criteria in Public Project Selection". Economic Journal, Vol. 79, 832-893.

McNulty, M.L., Ayeni, M.A.O., Filani, M.O. and Olaore, G. (1984): "Access to Rural Services in Nigeria" in Lonsdale, R.E. and Enyedi, G. eds. Rural Public Services: International Comparisons. (Westview Press Boulder and London). 315-337.

Miller, R.L. and J.S. Kahn (1962): Statistical Analysis in the Geological Sciences, New York.

Morrill, R. L. and Earickson, R. (1969): "Locational Efficiency of Chicago Hospitals". Health Services Research Vol. II, 127-141.

Morrill, R.L. and Sumons, J. (1977): "Efficiency and Equity Aspects of Optimum Location", Geographical Analysis Vol 9, 262-270.

Mladenka, K. (1978): Orgnisational Rules, Service Equality and Distributional Decisions in Urban Politics. Social Science Quarterly 59, 192-201

Mladenka, K. and K. Hill (1977): "The distriburion of benefits in an urban environment". Urban Affairs Quarterly, 13, 73-94.

Nigeria (1962): First National Development Plan 1962-1968. (Federal Ministry of Economic Development, Lagos).

Nigeria (1970): Second National Development Plan (1970-74) (Federal Ministry Economic Planning, Lagos).

_____(1975): Third National Development Plan 1975-1980. (Ministry of Economic Planning, Lagos).

_____(1981): Outline of the Fourth National Development Plan 1981-1985. (Federal Ministry of Economic Planning, Lagos).

_____(1984): National Population Bureau (Demographic Division) Lagos.

_____ (1985): Stattistics of Education of the Federal Republic of Nigeria. Federal Ministry of Information, Printing Division, Lagos).

Nordbeck, S. (1965): 'The Law of Allometric Growth'. Michigan Int-Com. Math. Geog. No. 7 Quoted in D. Harvey, 1973.

Nutley, S.D. (1979): 'Patterns of Regional Accessibility in the NW Highlands and Island' Scottish Geographical Magazine December, 1979, 143-154.

O'Conor, J. (1974): The Corporations and the State (New Harper and Row).

Okafor, S.I. (1977): 'Spatial Efficiency of General Hospitals in Afenmai'. Unpublished Ph.D. Thesis. Department of Geography , University of Ibadan, Ibadan, Nigeria.

_____ (1982): 'Policy and Practice - The Case of Medical Facilities in Nigeria' Social Science and Medicine (16) 1971-77.

_____ (1985): Inequalities in the distribution of Health Care Facilities in Nigeria. University of Ibadan, Departement of Geography, Mimeo.

_____ (1986a): Spatial Variations in Educational Development in Nigeria. Department of Geography, Mimeo.

_____ (1986b): Intra-Urban Ecology of Health Care: A Nigerian Case Studies. Staff/Post-graduate Students Seminar. Department of Geography, University of Ibadan, Ibadan.

Omoyeni, S.A. (1982): 'School Mapping as a tool for Rationalization of Spatial distribution of Secondary Schools in Ondo State'. Unpublished Ph.D. Thesis, Department of Educational Management, University of Ibadan, Ibadan.

Onibokun, Poju (1979): Oyo State: A Survey of Resources for Development. (NISER, Ibadan).

Onokerhoraye, A.G. (1979): Planning the Location of Social Services in Nigeria (NISER, Ibadan Mimeo).

_____ (1982): Public Serivces in Nigerian Urban Areas: A Case Study. (NISER, Ibadan).

_____ (1984): Social Services in Nigeria - An Introduction (Kegan Paul, London).

Onyemelukwe, J.O.C. (1977): 'Rural Amenities Provision in Nigeria: A Spatial Equity and Socio-cultural Problems' in O. Adejuyigbe and F.M. Helleniner, eds. (1977) Proceedings of the 20the Annual General Conference of the Nigeria Geographical Association. University of Ife, Ile-Ife, March 20-26, 1977.

Oyebanji, J.O. (1986): Coat of Many Colours. Inaugural Lecture. University of Ilorin, Nigeria December 11, 1986.

Oyo State (1978): Approved Estimates, 1978-79, including Budget Speecth by Brigadier David Jemibewon. (Government Printer, Ibadan).

Oyo State (1981): Approved Estimates Including Budget Speech, by Chief Bola Ige (Government Printer, Ibadan).

Oyo State (1982): Approved Estimates including Budget Speech, by Chief Bola Ige (Government Printer, Ibadan).

_____ (1985): Approved Estimates including Budget Speech, by Lt. Col. Oladayo Popoola. (Government Printer, Ibadan).

_____ (1986): Approved Estimates, including Budget Speech, by Col. Adetunji Idowu Olurin. (Government Printer, Ibadan).

Oyo State (1983): Statistical Abstract. (Ministry of Economic Planning Statistics Division, Ibadan), 1984.

Owens, E. and Shaw, R. (1972): Development Reconsidered: Bridging the Gap Between Government and People (D.C. Health Lexinghton, Massachusetts).

Pacione, M. (1984): 'Evaluating life quality - An Application of the Welfare approach to human geography'. University of Strathclyde, Department of Geography. Research Seminar Series No. 8

Parking, A. (1982): Governing the cities: the Austrian Experience in Perspective (Melbourn, Macmillan).

Pirie, G.H. (1979): "Measuring Accessibility: A Review and Proposal". Environmental Planning A. 1979 Vol. 11, 299-312.

Piven, F.F. and R.A. Cloward (1971): Regulating the Poor. (New York, Random House) 1971.

Rich, R.C. (1979): 'Neglected Issues in the Study of Urban Service Distributions', Urban Studies 16, 143-156

_____ (1982): 'Urban Development and the Political Economy of Public Production of Serices', in A.M. Kirby and S. Ponch, eds. (1982) Public Provision and Urban Politics, University of Reading, Department of Geography GP.80.

Rosenberg, M.W. (1983): 'Accessibility to Health Care: A North American Perspective'. Progress In Human Geography (7) 1, 78-87.

Rosen, R. (1976): Optimality Principles in Biology (London)

Sada, B. and J.S. Oguntoyinbo eds. (1981): Urbanization Processes and Problems in Nigeria. (Ibadan University Press, Ibadan).

Sax, S. (1972): Medical Care in the Melting Pot: An Australian Review (Sydney, Augus Robertson).

Seley, E.J. (1981): 'Introduction: New Directions in Public Services'. Econ. Geog. Vol. 57(10-19)

Schneider, J.B. and J.G. Symons (1971): 'Regional Health Facilities System Planning: An Accessibility Opportunity Approach'. Discussion Papers No. 48. Regional Science Research Institute, Philadelphia.

Scott, A. (1971): Combinatorial Programming, Spatial Analysis and Planning, (Methuen, London).

Smith, D.M. (1977): Human Geography - A Welfare Approach. (Edward Arnold).

_____ (1975): Patterns in Human Geography: An Introduction to Numerical Methods (David and Charles, Newton).

Stefford, M. (1963): "The Functional Bases of Small Towns", Economic Geography Vol. 39, 165-175.

Streeten, P. (1977): The Distinctive Features of Basic-Needs Approach to Development. (Mimeo, Washington, D.C.: World Bank).

Stimson, R.F. (1982): The Australian City: A Welfare Geography. (Melbourne, Longman, Chesire).

Tarlo, K.G. (1980): 'The Location of Social Facilities: Equity and Local Autonomy in Service Provision' Social Science and Medicine Vol. 14D, 233-235.

Teiz, M. (1968): "Towards a Theory of Urban Public Facility Location". Papers of the Regional Science Association 13, 35-51

Tornqvist, Gunner (1963): Studies Industrilokalisering) Stockholm: Geografiska Institutionen Vid Stockholm Universitet, quoted in Hom, S. (1970) op. cit.

Ulman, E.L. and M.P. Dacey (1962): "The Minimum Requirements Approach to the Urban Economic Base" Land Studies in Geography. Human Geography Series B. 24, 121-143.

Walker, S.R. (1979): "Educational Services in Sydney, Some Spatial Variations". Australian Geographical Studies 1979, (17) 175-192.

_____ (1981): Welfare Economics and Urban Problems, (London, Hutchinson).

White, A.N. (1979): 'Accessibility and Public Facility Location'. Economic Geography, Vol. 55, 1979, 18-35.

Yeates, M.H. (1963): 'Hinterland Delimitation: a distance minimizing approach'. Professional Geographer 15 (6), 7-10.

Yamane, T. (1973): Statistics: An Introductory Analysis (3rd Edition) Harper International.

Young, D.R. (1975): "Introduction to Part II" Urban Problems and Public Policy Choices. Bergsman, J. and H. Wiener eds.