THE IMPACT OF PROPOSED IRON AND STEEL C0MPLEX AT AJAOKUTA ON ITS INFLUENCE REGION

M.Sc. (URP) THESIS

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TO THE MEMORY OF MY FATHER

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CERTIFICATE

This is to certify that this Thesis has been submitted in partial fulfillment of the requirements for the award of the Degree of Master of Science, Urban and Regional Planning.

APPROVED

ZARIA
JUNE 1977

PROFESSOR S. JUCHNOVIC
HEAD OF THE DEPARTMENT

TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENT	.. ..	i
List of Tables	.. ..	iii
List of Diagrams	.. ..	iv

PART ONE

CHAPTER ONE

1.0	Introduction	1
1.1	Preamble	1
1.2	Aims and Objectives ..	2
1.3	Limitations	3
1.31	Delineation of Influence Region ..	4
1.32	Data Collection	6
1.33	Lack of Literature ..	7
1.4	Methodology	7
1.5	Review of Literature and analytical techniques.	10

PART TWO

CHAPTER TWO

2.0	Background to Study Area ..	19
2.1	Location	19
2.2	Topography	19
2.3	Soils	21
2.4	Climatic Conditions ..	21
2.5	Vegetation	22
2.6	Socio-Economic Conditions ..	24

CHAPTER THREE

3.0	Assessement of existing conditions and Potentials	29
3.1	Population	29
3.2	Settlement Patterns ..	32
3.3	Transportation	37
3.4	Infrastructure	41

Page.

CHAPTER FOUR

4.0 Review of Programme of Development of the Steel Plant by N.S.D.A. .. 44

4.1 Introduction 44

4.2 Preparatory Stage .. 45

4.3 Initial production Stage .. 48

4.4 Sustained Phase 51

4.41 Sustained Phase Stage I .. 53

4.42 Sustained Phase Stage II .. 53

4.43 Full Capacity .. 54

4.5 In-Migration 56

PART THREE

CHAPTER FIVE

5.0 Assessment of the Impact of the Steel Complex on the Region

5.1 Introduction 63

5.2 Population 63

5.3 Settlement Patterns .. 68

5.4 Transportation Networks .. 71

5.5 Quality of Environment .. 74

5.51 Dust, Smoke and Particulate Matters .. 76

5.52 Waste Water 77

5.53 Noise 77

5.54 Quarrying and Mining .. 78

5.6 Infrastructure 79

5.61 Electricity 80

5.62 Water Supply 80

CHAPTER SIX

6.0 Summary of findings, Policies and Recommendations 83

6.1 Summary of Findings .. 83

6.2 Broad Policy Decisions based on Findings and Objectives .. 84

Page

6.21 Settlements 84
6.22 Transportation 85
6.23 Environmental Problems .. 86
6.3 Recommendations .. 86
6.4 Proposals 87

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LIST OF TABLES

Page

TABLES

III - i	Igbirra division, population by district for 1963, 1973 and 1976 ..	30
III - II	Distribution of Settlements by population and function	33
III - III	Provision within the Region by type and length	38
III - IV	Distribution of Services and facilities in the study region ..	42
IV - I	Volume of In-migration (1976-80) ..	46
IV - II	Volume of In-migration(1981 - 84) ..	48
IV - III	Volume of In-migration (1985-1995)	52
IV - IV	Estimated in-migration 1976 - 1995	54
V - I	Population of Settlements by Year 2000	65
V - II	'Breaking Point' from Ajaokuta to Neighbouring Urban Centres ..	67
V - III	Expected annual Input of Steel Plant at 1.3 million tons output ..	72
VI - I	Programme of land use development in some settlements by year 2000 ..	89

LIST OF DIAGRAMS

FIGURE		Page
2.1	Locational map of the proposed Steel Complex in Kwara State ..	20
2.2	Physical Setting of the Study Region	21
2.3	Ajaokuta Area detailed Relief ..	21
2.4	Percentage Distribution of Existing workers by occupation by area ..	25
3.1	Ajaokuta Area population distribution	30
3.2	Distribution of Existing Settlements by size 1976	32
3.3	Existing transportation Networks ..	38
3.4	A Wooden bridge along Okene to Ajaokuta Road	39
3.5	Distribution of Existing Facilities	42
5.1	Relationship between Steel Production and number of workers ..	54
5.2	Unadjusted population of Existing Settlements by year 2000 ..	64
5.3	Estimating changes in Ajaokuta Trading Area between 1976 and 2000. Using breaking point formula ..	67
5.3	Settlements to be displaced by the Steel Complex	68
5.4	Sources of raw materials for the Steel works.	70
5.5	Direction of movement of raw materials and goods. Transport desire Lines	72
6.1	Proposed Settlement patterns for year 2000 by size and location ..	88
6.2	Proposed Transportation Networks. ..	90

PART ONE

CHAPTER ONE.

I N T R O D U C T I O N.

1:1 PREAMBLE.

Iron and Steel Industry is one of the basic industries whose establishment may be linked to local users and other industries. It is also of strategic importance to nations economy, the realization of which will lead to increase job opportunities and regional development.

The establishment of an integrated iron and steel plant in Nigeria has been under active consideration for almost twenty years. The project was included in the first and second National Development Plans but it was not until the third plan that measurable progress took place. The problems of location caused by regional pressure groups were resolved and Ajaokuta, a village along the Western bank of river Niger in Kwara State was selected as the proposed site.

In 1971 under the second National Development Plan, a Nigerian Steel Development Authority (N.S.D.A.) was charged with the responsibility of establishing the first integrated steel complex in the country. A Russian firm of consultants know as TECHNO EXPORT was

selected as the technical paterner. Techno export was commissioned to carry out a detailed analysis of the requirements of the project and also to determine the adequacy of the local raw materials. This led to the discovery of good iron ore at Itakpe hill near Okene and also coking coal at Lafia in Plateau State.

In the third National Development Plan tentative sum of ₦800 million was allocated to N.S.D.A. for the excution of the project. In the plan, the Federal Government announced its intention to actively encourage the establishment of two direct reduction plants in addition to the proposed blast furnace. Detailed plans for the construction of the Steel mill are being prepared by the Soviet Techno export in consultation with the Nigerian Steel Development Authority.

1.2 AIMS AND OBJECTIVES.

In an establishment of such a magnitude as the proposed steel complex, it is essential that adequate planning is carried out so as to elucidate some of the inherent problems and also attempt at their solutions. The realization of this fact led me to attempt an impact study of the proposed iron and steel complex on its influence region. This study attempted to bring out some of the

regional implications and also suggest reasoned solutions, so that the spill over from the industry can be better utilized for regional upliftment of the area. This aspect of the scheme, to my knowledge, has not been investigated. The aims and objectives of the thesis therefore are:

(a) To examine and analyse the existing conditions in the area in order to assess their potentials with respect to the proposed steel plant.

(b) To examine the programme of actions of N.S.D.A. towards implementation of the project and thereby predicting expected inmigration.

(c) To determine the impact of the project on its influence region with respect to (i) population distribution (ii) settlement patterns (iii) transportation (iv) infrastructure. (v) Quality of environment

(d) To give recommendations, policies and proposals on a new regional order for the region to reflect my findings.

1.3 LIMITATIONS.

A number of problems were encountered during the research, which invariably affect my findings and proposals. The most important ones are discussed below.

1.3.1 Delineation of Influence Region:

There is no universally agreed definition of what a region is. Political boundaries are often employed to delimit planning areas but in a study that transends political boundary, like the one at hand; this willnot be appropriate.

Friedman[1], in his contribution to the problem of regional delineation identified five types of regions. These are (i) Core Regions (ii) Upward Transtional Region (ii) Downward Transitional Region (iv) Resource Frontier Region which may be either contigous or non-contiguous (v) Special Problem Areas. The non-contiguous Resource Frontier Region which is defined as areas of large scale investment with reference to developing a mineral resource or Hydro Electric Power, aptly define my present study area.

In the report of the Interregional Seminar on Industrial Location and Regional Development held at Minsk in August 1968 under the auspices of UNIDO, four types of regions were identified[2]. (i) Developed Region (ii) Less developed region (iii) New opportunity region (iv) Depressed fegion. My present study area falls within the category classified as New Opportunity Region. This type of region is described as a region withi a country that is characterised by sparse population and by an undeveloped natural resourse potential whose economic

utilization could lead to the development of the region and faster National growth.

At the Regional Planning Conference held at Ibadan in 1972, a region was described as the most effective unit for decision making[3].

Keeble[4] described a region as an area of land possessing characteristics which make it a ~~reality~~ readily identifiable entity; these characteristics may be physical, economic or social. He went further to describe ideal region as an area which is large and self contained enough to enable substantial changes in the distribution of population and employment to take place within its boundaries, yet which is small enough for its planning problems to be comprehended as a whole.

All the above definitions and descriptions failed to give clear cut method to delineate such regions. Gravity model which could have been used to solve this problem is also inappropriate due to lack of quantifiable data with which to establish the zones of absolute and overlapping region.

For the purpose of this study therefore my region was determined by using the available data for gravity

model analysis, areas covered by Nigerian Institute of Social and Economic Research (NISER) in their socio-economic survey of the area, sources of raw materials, areas of potential local food production and all those areas likely to be affected by physical development of the steel complex.

1.3.2 Data Collection:

This study involves wide areal coverage, skilled man-power, large financila resource and length of time to collect the data from primary sources. In addition to this, NISER, at Ibadan had very recently completed a socio-economic study of the area for the Nigerian Steel Development Authority. I will therefore rely heavily on that data and reports of planning consultants appointed by Kwara State Government to study some towns in the area. Unfortunately, N.I.S.E.R.'s report covered only the Kwara sections and some riverine villages in Benue State. This further complicate my problems.

Population data for the area still dates back to 1963 census as in all other parts of Nigeria, but necessary provisions were made to bring them up to date.

1.3.3 Lack of Literature:

The dearth of relevant literature is one of my greatest constraint. This is even more so, when most impact studies are retrospective and none has been carried out in this area. The little literature that are available are too generlised and scanty to be of immense help.

None availability of documents on the details of the steel plant makes it impossible for me to quantify the extent of environmental degeneration expected in the vicinity of the steel plant. However, the likely pollutants at different stages of production were identified and appropriate measures were recommended. These measures were based on comparative study and international standards.

1.4 METHODOLOGY.

This study has been divided into three parts. Part one deals with the aims and objectives of the study, collection of data and a review of literature and analytical techniques.

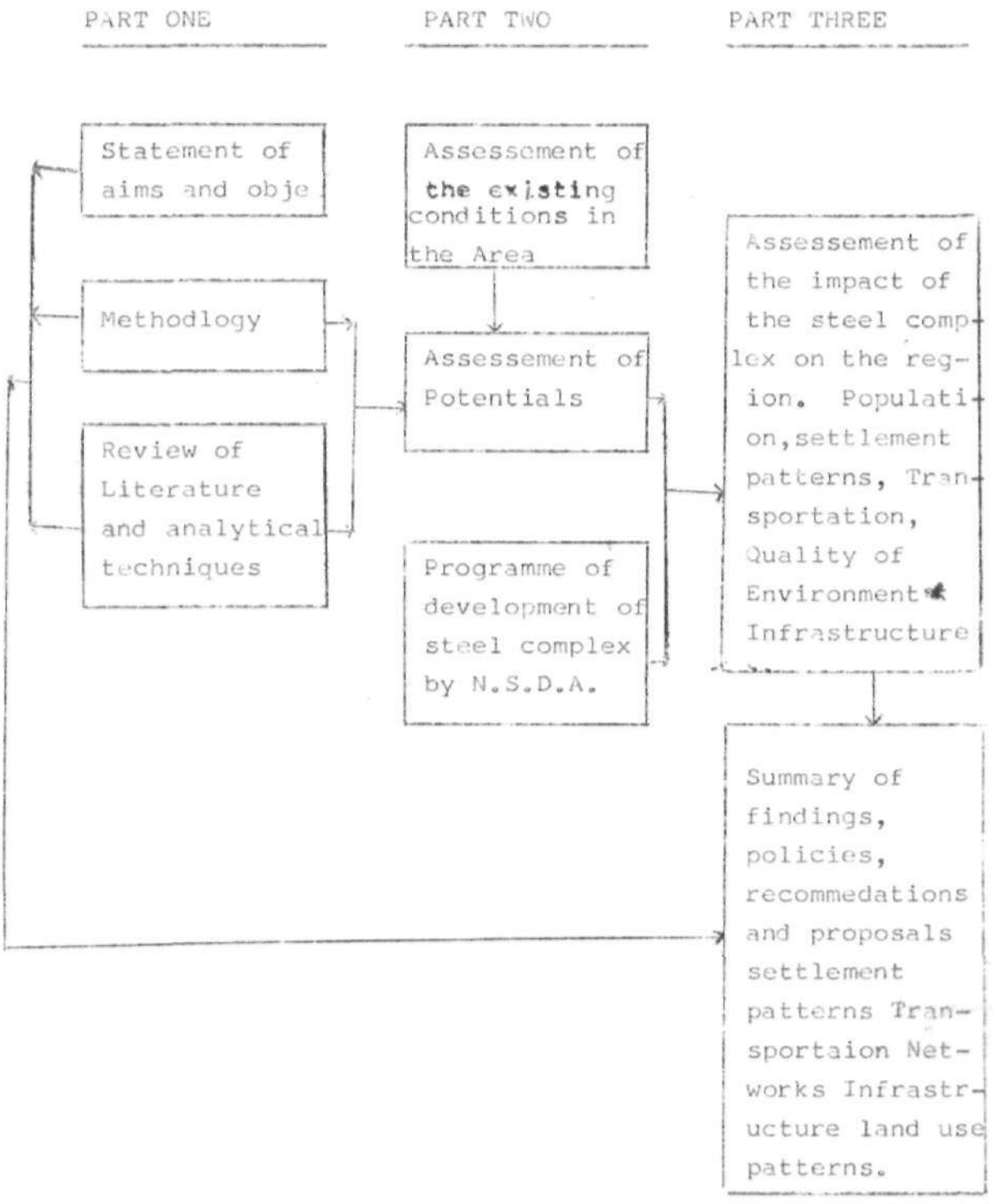
Part two has been devoted to analysis and assessment of existing conditions in the area and also an

analysis of programme of development of the steel plant by N.S.D.A. This gives guidelines as to the possible rural-urban migration and restrcturing of settlement patterns in the area.

Part three forms the major section of the study and it contains (a) an assessement of the impact of the proposed steel plant on the various aspects discussed in the objectives; (b) Recommendations, Policies and Proposals that will ultimately lead to a regional plan of the area under study.

Through comparative study of existing steel plants in other parts of developing nations, some standards were evolved and used to determine net in-migration at different stages of production. Gravity model has also been employed using the only data available - population. The accuracy of this method can not be better than the premise on which it is computed. The method, however, revealed changes in degree of attractiveness of the major surrounding settlements with respect to the proposed Steel city.

METHODOLOGY.



1.5 REVIEW OF LITERATUTE AND ANALYTICAL TECHNIQUES.

Regional Studies encompass many aspects of physical planning thought and it is as diversed as the member of regions themselves. The techniques and analysis are multivarious depending on the natute of the problems and the data available. This review briefly discusses various methods of regional delineation, use of gravity model in spatial analysis and recent works on regional studies with a view to apply them to the study area.

A region is normally determined with reference to a focal point, which may be a major urban centre, mining centre or industrial centre as in this case of proposed iron and steel city Ajaokuta. The sphere of influence of any such centres depends on availability of transport, and number of attrations in form of job opportunities, goods and services available.

The earliest method used to delimit spheres of influence is the isochrones. This is defined as line joining places that can be reached from a particular settlement at a given time[5]. In those days a distance of about 8 - 10 kilometers which can be covered in about two hours while trecking is regarded as optimal sphere of influence. This principle no longer holds as

the incidence of moter cars, train ways, electric trains have drastically reduced travel time.

Regional delineation of a city can also be arrived at through census count of all workers in that city. This method aimed at determing the recruitment area which invariably gives the periphery area where the power of attraction of the city is considerable. The power of attraction of any city varies according to its size and its dynamism measured in terms of function. This method could not be applied to the present study due to unavailability of data.

The influence of a town on its region vary with time and circumstance[6]. W. Christaller (1953) developed a formular based on retail trade to determine the centrality of a given centre. Thus:-

$$Ct = St - \frac{Pt \; St}{Pr}$$

where Ct = Centrality of the Centre

St = No. of Inhabitants in the city employed in retail trade.

Pt = Population of the city.

Sr = No. of Inhabitants in the region employed in retail trade.

Pr = Population of the region.

Various attempts have been made in different parts

of the world to apply this Chrisfaller's theory. Jean Coppolan: (1954) has used it to determine the zones of influence of Toulouse while J.E. Brush (1953) used same for the city of Wisconsin in America. J.H. Schultse applied the same principles ~~of~~ to forty towns in Western Germnay.

Professor Vagale (1969) while writing on the city of Chandigarh and its environs wrote unter-alia that, "The delineation of city centred region is a complex task and it involves several factors such as retail and wholesale, catchment area for education and health facilitites ..... All the above factors must be mapped and supperimposed to determine the common boundary".

In another contribution on the impact of Bhilai Steel Complex on its influence region he identified nine variables which by interpolation with respect to a ~~datrus~~ date n positive and negative values are determined.[7] He marked eight cardinal axis with Bhilai as the centre and plotted the variables by interpolation. These he later superimposed to find the common area which was adjusted to the boundary of the nearest settlement. The limit thus determined was regarded as the end of the sphere of influence of Bhilai. This is rather

comprehensive but due to lack of relevant data on the variables, it can not be used in the present study.

The technique developed by Dr. Learmoth and Dr. Rao could also be used to delineate the influence region of the proposed steel complex[8]. Their technique is based on the formular:

$$d = \sqrt{\frac{TA}{\Pi V}}$$

where d = vadius of the circle of urban influence

T = Popl of the Centre.

A = Total area of the district

V Population of the Urban Centres in the district.

The stortcomings of this simple techinique stem from lack of precise definations of a district and urban population.

W.J. Reilly (1929) make siginificant contribution towards evolving mathematical model for delimiting the breakpoint between two competing centres. His work was improved upon by P.D. Converse (1949) who made it possible to delineate city's ~~vethil~~ retail trading area through simple calculations thus:

$$Db = \frac{D\ ab}{1 + \sqrt{\frac{Pa}{Pb}}}$$

where Db = the breaking point between city A and B in Kilometers

D ab = Distance between A and B.

Pa = Population of city A.

Pb = Population of city B.

This method was applied to the present study to evaluate the impact of the city by the year 2000. Details will be discussed in the text.

Recently increasing attention is being paid to gravity and potential concepts of human interaction with a view of utilizing same to predict the future[9]. The gravity concept briefly states that the attractive force between two areas of human activities is directly proportional to the product of their population and inversely as a function of distance apart. Thus mathematically

$$Iij = \frac{f\ (Pi\ Pj)}{f\ (Dij\ )}$$

where Iij = Interaction between Centres i and j

Pi = Population of Centre i

Pj = Population of Centre j

Dij = Distance between centres i and j

H.C. Lavey (1859) was the earliest to formulate this concept explicitly. E.G. Ravenstesin (1889) presented empirical evidence to suggest that migratory movement tends to be towards cities of large population and that the volume of migration decreases with distance between source of migration and centre of absorption.

$$\text{i.e } iMj = \frac{f(Pi)}{Dij}$$

iMj = Migration from j to centre i.

Pi = Popl of centre i.

Dij = Distance between source j and centre i.

E.C. Young (1924) while working on the same premise developed a formular to estimate the in-migration to a given centre. He posstulated that the relative volume of in-migration to a given destination from each of the several sources varies directly with the force of attraction of the destination and iversely with the square of the distance between the source and the destination.

$$\text{i.e } iMj = \frac{K\angle i}{Dij^2}$$

where Zi = the force of attraction of destination.

K = constant of proportionality.

The model was applied in this study using job opportunities as force of attraction to determine net migration from neighbouring centres to the steel complex. (See chapter 4.)

In 1940s J.Q. Stewart and G.K. Zipf developed a generlised gravity concept of human interaction[6]. It says that the force of interaction between two concentrations of population acting along a line joining their

centres is directly proportional to the product of the population in the two centres and inversely preportional to the square of the distance between them.

$$\text{i.e } Fij = \frac{PiPi}{Dij}_2$$

where Fij = Force of interaction between centre i and j.

This concept was extended to include the concept of 'potential of population'. Briefly the concept states that at a given location i, the potential influence with respect to any individual at i which is generated by the population of an given area j, will be greater as the population of j and will be less as the distance between i and j increases.

$$\text{i.e } iVj = \frac{K\ Pi}{Dij}$$

where iVj = Potential at i of the population of area j.

K = Constant of proportionality equal to the grenistational constant of physics.

The gravity potential can be mapped to show places of equal potential.

J.D. Caroll (1955) modified this technique and came out with a formular that can be used to determine the

sphere of influence of a given town. He assumed that (a) there is a flat terrain (b) urban influence is proportional to size/population (c) constant rate of change with distance He errected a pole at each centre to represent the population. The tent thus formed by the pole over the surrounding area corresponds to the area of influence of the centre. The formular used is:

$$jUi = \frac{K\ Pi}{Dij^{\not s}}$$

where jUi = Urban sphere of influence of centre i upon any point j.

$\not s$ = A constant exprineat deterained to be 2.8.

It is pertinent to mention here that Stewarts idea of population has greatly been modified to reflect the characteristics of urban population. Weightages are now assigned to the population to reflect the activities under consideration. Thus the original formular becomes

$$Eij = \frac{K\ Mi\ Pi\ Mj\ Pj}{Dij}$$

where Eij = Energy of interaction i at j.

Mi = Molecular weight of individual at i.

Mj = Molecular weight of individual at j.

R E F E R E N C E S.

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PART TWO

CHAPTER TWO.

BACKGROUND TO THE STUDY AREA.

2.1 LOCATION:

The study area lies between latitudes 7°-8°N and longitudes 6°-7°E in the central part of the Nigerian middle belt. The area consist of Adabi and Lokoja districts of Kwara State and former Idah and Dekina divisions in Benue State. (See Fig. 1).

Ajaokuta, the proposed steel city is presently a small village on the Western side of river Niger and approximately 70 kilometers from Okene, due West of it, and 36 kilometers South of Lokoja - the confluence town. The proposed iron and steel complex falls within Ajaokuta district with approximately 80 percent of the proposed projects lying within it, while the remaining falls into the surrounding areas.[1]

2.2 TOPOGRAPHY:

The area under study lies entirely over the basement complex which have been covered with alluvial deposits along the river Niger. The land rises gently from the Niger valley at a height of about 150 meters to a height of over 330 meters above see level (a.s.l.) around Okene.



KWARA STATE LOCAL GOVERNMENT AREAS

20 0 20 40 60 80 100 km

40000 HECT

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Drg 2.1

NEW BUSSA

BORGU

BODE SADU

MORO

LAFIAJI

SHARE

ASA

ILORIN

IFELODUN

EDU

AFON

OYUN

OFFA

IREPODUN

OMUARAN

OYI

KOGI

KABBA

OKEHI

OBAJIGEDE

OKENE

EKOJA

STEEL PLANT SITE

AJAOKUTA

OKENE

IDAH

LEGEND

INTERNATIONAL BOUNDARY

STATE "

LOCAL GOVERNMENT BOUNDARY

AFON ADMINISTRATIVE HEADQUARTERS

KWARA STATE LOCAL GOVERNMENT AREAS

20 0 20 40 60 80 100 km

40000 HECT

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1976/77

Drg 2.1

Lokoja area is however, characterised by sudden rise of Mt Patti and adjacent Agbaja Plateaux . To the eastern side of river Niger the rise from the Niger valley is rather steeper and highly undulating. The average height is about 225 meters a.s.l. ~~maps 2~~ fig 2.2 refers to the terrain generally while ~~map 3~~ fig 2.3 is the detail around Ajaokuta itself

Along the laterite road from Itobe to Araba the ~~gratlicent~~ gradient is very steep and it reaches a height of about 300 meters within about 40 kilometers. The only major hills are Itekpe hils (525 meters) and Mt. Patti (400 meters). The spradic occurence of granite domes and hiselbergs intersparsed by wooded valleys lend some beauty to the whole area.

Apart from river Niger that formed the main drainage, there are other numerous tributaries of the Niger out of which rivers Ero and Mimi stand out prominently. This section of the Niger is navigable throughout the year for small barges. At the height of the raining season, the immediate areas are often flooded but in the dry season, Islands of sand dunes are exposed and navigation becomes hazardous. The occurence of these sand dunes is a major problem that ~~inlitates~~ militates against the us of river Niger by bigger boats.



AJAOKUTA IRON AND STEEL PROJECT. PHYSICAL SETTING

0 4 8 12 16 20 KM

1600 HECT

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Drg 2.2

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AJAOKUTA AREA RELIEF

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planning
a. b. u. zaria

2.3 SOILS:

Soil fertility depends on the topographic position and composition of the base rock of the area under consideration. In the Niger valley, hydromorphic soils which develop in alluvium predominate. This is more fertile than the upland soils. In most cases sandy deposits overlie the richer subsoil made of clay materials. As one moves up the Niger valley on either sides, the effect of water and alluvial deposits reduces to form ferruginous tropical soils. This is characterized by brownish colour, indurate zones and ironstone concretions which may be as thick as one meter in some cases. The axis between Okene, Lokoja and Kabba area contain more than its fair share of these iron pans. Agricultural production will therefore be limited in this zone around Dekina and Ayangba the land is relatively more fertilie and very suitable for production of food crops.

2.4 CLIMATIC CONDITIONS:

Climatically, this region belongs to the continental type of Kopen's air zones[2]. It is under the influence of two major air masses, namely the hot, moist tropical maritime (ME) air mass and the dry continental air mass (CTS). The tropical maritime prevailed from late March to early October. It is during this period that most of

the precipitation are recorded. From October to March, the area is under the influence of the dessicating continental northerly with winds known as harmattan with associated dust and cold spells.

The average annual temperature ranges between 18°C and 25°C at the height of dry season and wet season respectively. This is the major reason while the area is generally very hot in the wet season with high percentage relative humidity.

The onset and the end of raining seasons are characterised by thunderstorms while the August break is associated with thick cloud cover. Total average annual rainfall varies from about 1500mm in the south and 1250 mm in the north around Lokoja. The average raining days for the area is about 86 days in the North and 90 days in the South at Idah.

2.5 VEGETATION:

Vegetation is a direct result of soil types, climatic conditions and human activities. This study area falls within the zone normally referred to as guinea savana[3]. It is characterized by tall elephant grasses - (Isoberlina doka) during the wet season which is dotted

by scattered trees. These ~~areas~~ trees are decidous with broad leaves and short trunks. The leaves are shed during the drier part of the year when all the grasses turned brownish and burnt off by the local farmers. The most prominent among these trees are shea butter tree and mango trees which serve as both shade tree and food crop. Palm trees are scattered all over the area but are more prominent along the river channels. It is noteworthy to mention that the vegetal cover vary from river valley that are associated with tall trees and thick undergrowth to the hill tops that are associated with grasses and lichens. The hill tops form the graze land for the cattle ~~which~~ while agricultural activities are limited to the valley floors or gently undulating topography.

Though the area is sparsely populated, the long period of human occupation of the study area has led to elimination of original forest to produce secondary forest that are now the common sight.

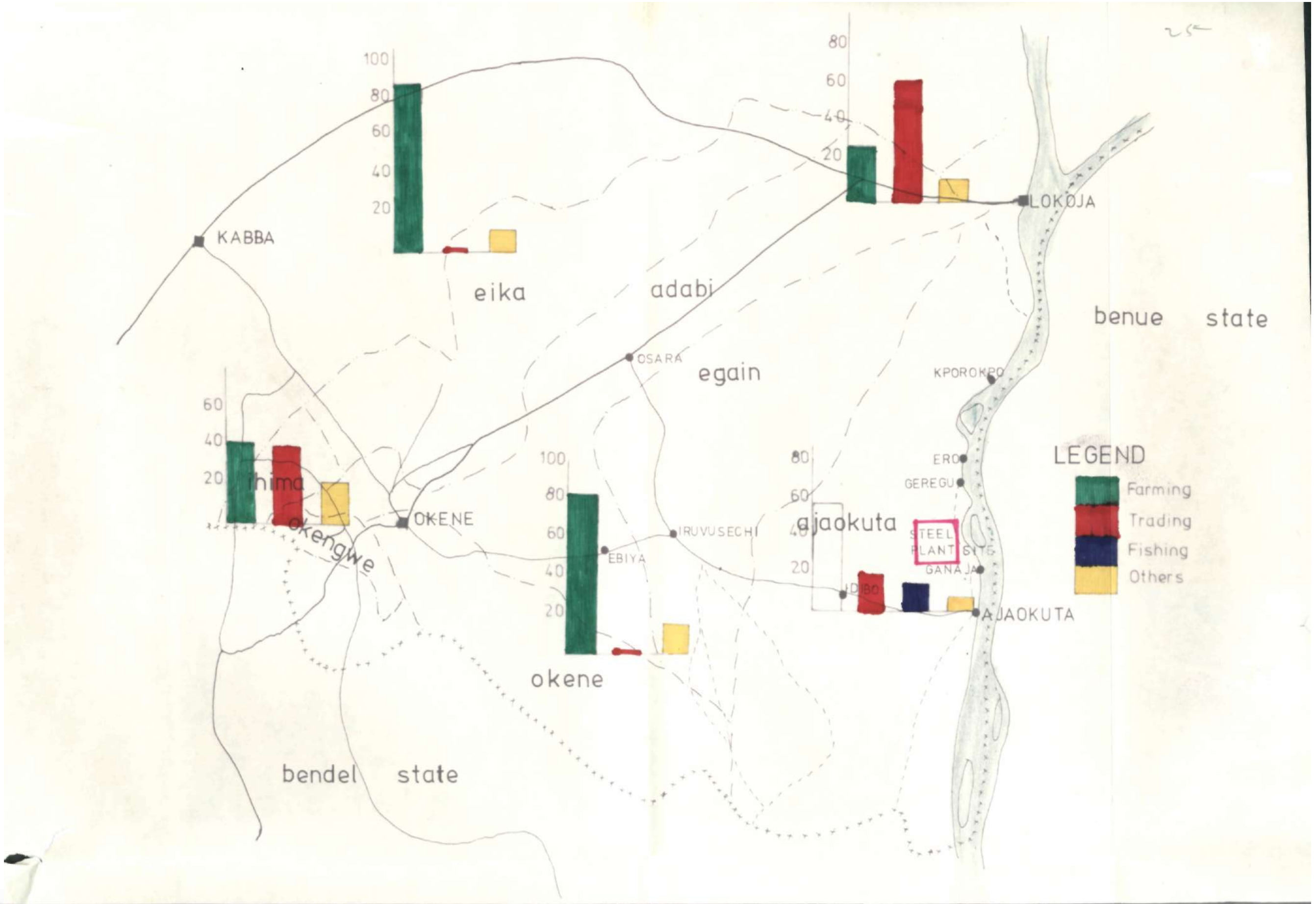
In the more rugged terrain around Lokoja, about twenty five per cent of the total area are forest reserves. This forest reserve produce pulp wood for Jebba paper mill and some hardwood for local use.

The gradual deafforestation of the area, has resulted in high incidence of soil erosion and its associated problems.

2.6 SOCIO-ECONOMIC CONDITIONS:

The area covered by the study is a miniature Nigeria with many ethnic groups living together for their general upliftment. The north western part stretching from Okebukun to Akpata are occupied by people of Yoruba origin while the south western section is dominated by the Igbirras with Okene as their traditional headquarters. The eastern side of river Niger is occupied mainly by the Igala speaking people. The settlements along river Niger itself, especially Lokoja and Ajaokuta are more heterogeneous in ethnic compostion. This might have resulted from increased accessibility created by river Niger.

The Bassanges, Nupes, Hausas and Ibos are the most important ethnic groupings found in the area. While the Bassanges are traditional farmers, the Hausas and Nupes engage themselves in trading and fishing. In the North ~~Sestern~~ Eastern section, christians are the majority but in the riverine and Igala land, muslims predominate. Traditional ~~relions~~ religions and festivals are also observed especially around Okene to Ajaokuta axis.



PERCENTAGE DISTRIBUTION - OF EXISTING WORKERS

BY OCCUPATION BY AREA.

3 0 3 6 9 12 15 Km

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DEPARTMENT OF URBAN AND REGIONAL PLANNING

A. B. U. ZARIA.

Msc. (URP) Thesis

3600 HECTARE

Drg. 2.4

1976/77

Subsistence agriculture is the major occupation of this region, engaging about 80 percent of the working population. The only cash crops are beniseed and palm products. The lack of ~~cash~~ cash crop has led to poor development of road networks in the area which invariably ~~t~~resulted in poor marketing facilities of available food crops and general poverty. The physical barrier created by river Niger, which has hitherto been uneconomical to bridge, helps to aggravate this acute shortage of road networks.

Grains and root ~~riot~~ crops of both the forest and Sudan zones are grown in this ~~a~~ region. The excess food produced especially in Igala land are often exported to the more peopled zones of Cocoa belt and northern parts of Nigeria. Guinea Corn, Millet, Rice and Acha form the grain crops grown in large quantities while yams, cassava and sweet potatoes are the major root crops.

Animal production has hitherto been limited to goats, pigs and poultry, but with the elimination of tryponosomiasis, cattle is becoming increasingly important especially among the cattle Fulanis.

Fig 2.4 ~~Map 4~~ shows the distribution of ~~coorkers~~ workers per occupation types in some locations within the study area. Generally farming is the most important and it engages about 85

percent of the working population except in the riverine areas where the figure falls to about 60 percent. Trading accounted for only about 3 percent of the work force except in the riverine area where the percentage rises to about 19 percent. Fishing is relatively unimportant in the region under study except in some settlements along the Niger where about 15 percent engage in it.

In about 50 percent cases only family or Household labour force is employed in farming activities, while hired labour accounted for about 25 per cent. The average annual income is very low and varies from an average of about ₦96 per annum to as much as ₦150 per annun in the riverine areas.

Land tenure system is that of inherittance common to the sourther parts of Nigeria. When the head of a family dies, his farmland is shared among his male children. This practise led to fragmentation of farm holdings. Farm sizes vary from 0.1 acre to about 2.5 acres. Farmers cover an average of 10 kilometers daily to reach their farms since only about 15% of the farmlands lie within a radius of 3 kilometers from the towns/villages.

Lack of incentives in farming, and poor returns due to poor marketing system, most of the able bodied men migrated to Cocoa zones of the South or the Sudan belt in the North. This trend has left the region with acute shortage of adequate man power, ageing of the population and poverty. This vicious circle of poverty may be brought to an end by the establishment of the proposed steel complex.

Less than 10 per cent of the total population has been exposed to one form of western education or the other. In the Northern zones about 94 percent are illitrates while some settlements like ~~Gergu~~ Gevegu and ~~Gbawag~~ Gbaveja have no Schools within 15 kilometers radius. This poor literacy level will further elucidate on the problems of economic take off of the region. Only unskilled labour force are likely to be available for the proposed steel complex.

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CHAPTER THREE.

ASSESSEMENT OF EXISTING CONDITIONS AND POTENTIALS.

3.1 POPULATION:

The study conducted by NISER revealed some notieable general characteristics of the population. These are:-

(a) a very large illitrate farming population, only about 10 percent are literate.

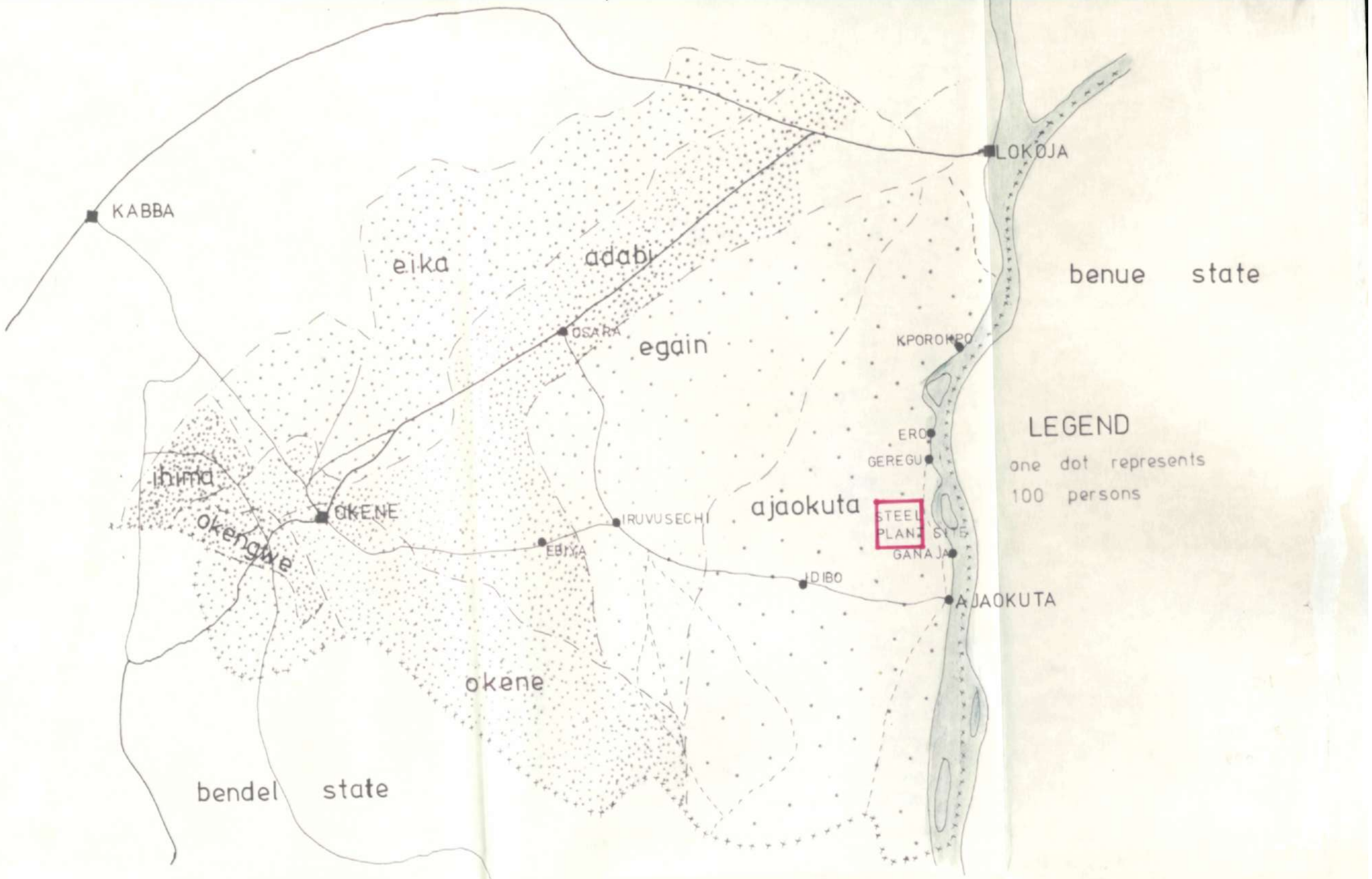
(b) high fertility and high mortality rate.

(c) low in-migration; about 25 percent of the population migrated into the area within the past five years.

(d) out-migration of young male adults.

The total population for Igbirra division, which now constitutes the new Okene and Okehi local government areas, is approximately 470,000 over an area of about 3,280 square kilometers. This gives an average of about 130 persons per square kilometers. Figure 3.1 shows the distribution of population over the area covered by NISER's study.

There is wide variation in a real distribution of the population. Okene complex which comprises of about eight settlements account for about 80 per cent of the total population. Ajaokutal and Egain districts are the least



AJAOKUTA AREA POPULATION DISTRIBUTION

3 0 3 6 9 12 15 Km

3600 HECTARE

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Drg. 3·1

1976/77

peopled areas within the division with about only 5 per cent of the population over about 45 per cent of the area.

Table III-I: IGBIRRA DIVISION:- POPULATION BY DISTRICT.

DISTRICT	1963*	1973	1976
EGAIN	9,905	12,480	13,379
ADAVI	98,368	123,944	132,868
EIKA	33,468	42,170	45,206
IHIMA	52,426	66,057	70,813
OKENE	76,644	96,571	105,524
OGORI-MANGOGO	7,766	9,785	10,490
OKENGWE	41,037	51,706	55,429
AJAOKUTA	5,641	7,116	7,628
	346,072	436,058	470,004

*Source - 1963 Census.

Others are projected.

There is high youth dependency on the population. children of 0-14 years account for about 45 percent of the total population. Presently, they constitute a large labour force in farming which is predominant. Potentially, they form the backbone of local labour supply for the

proposed steel complex. The female in the age group 15-50 years represents 29 percent of the total population while the males account for only 19 percent. This shows the high rate of male out-migration from that area, as stated in the general remarks.

The annual growth rates are manifestations of areal population inequalities. While the big settlements like Okene and Lokoja exhibits high growth rates of about 3-3.5 per cent annually, the rural areas grow at about 1-2.5 per~~sons~~cent. Infact some settlements around Lokoja in Oworo district are declining. The average annual rate of growth for the region is 2.35 percent.

The foregoing discussions showed that there is large expanse of land to accommodate the large influx of people expected in the area as a result of the proposed steel complex. Intensive and Extensive agriculture can also be practised after collectivization of the present scattered holdings.

The low percentage of able bodied young men, coupled with low literacy level, within the region militates against the possibility of procurring local labour force for the steel mill except in the low grades. The implication of this short coming is that, more houses would be required


RIVER BENUE
OKOJA
SHINTAKU
EKINA
SARA
OKENE COMPLEX
KPOROKPO
ERO
GEREGU
TERUMENA
GANAJA
AJAOKUTA
ARAGBA
ADUMU
ITOBO
UNOMI
OFOKAFI
GWOLAWA
AYANGBA
RIVER NIGER
250
500
750
1000
1250
LEGEND
500,000
250,000
100,000

in the immediate future to accommodate the new immigrants.

Okene and Lokoja with their large populations form potential markets for auxilliary industries that are likely to develop as a result of the proposed steel complex.

3.2 SETTLEMENT PATTERNS:

There is clear cut dicotomy in the distribution of settlements within this region. While the major centres which are constantly undergoing rapid trasformation in the form of population increase, extension of facilities and services, the rural centres are gradually being denied of their virite populations. The large centres are linked together by regional roads in a circular manner along the periphery of the region while the rural centres are connected by badly maintained seasonal roads. The rural settlements, most of which are less than 2000 persons, look towards the larger peripheral centres for most of their commercial activities. Infact settlements in Ajaokuta district including Ajaokuta itself need to cover up to 40 kilometers before they can see a medical doctor. Figure 3.2 shows the distribution of major settlements.

From table 3.2 below it can be readily comprehended that settlements in this area can be ranked into three compactments based on their populations.

Table III-II: DISTRIBUTION OF SETTLEMENTS BY POPULATION SIZES AND FUNCTION.

Settlement	Size	Function
Okene Complex	251,000	Administrative Headquarters.
Lokoja	35,000	Administrative Headquarters.
Dekina	10,000	Administrative Headquarters.
Idah	36,000	Administrative Headquarters.
Ayangba	17,000	Commercial Centre.
Ajaokuta	2,289	District Headquarters.
Osara	3,000	Farm Centre.
Ebiya	9,000	Farm Centre.

In the first category is the Okene Complex with a population of over 250,000. It comprises of eight settlements that are equidistant of about 8 kilometers from the next one. They are distributed radically from Okene township itself. These settlements are so interrelated that the development of any one of them can not be divorced from the others. It will therefore be logical

to refer to them as Okene Complex. These settlements are Okene (83,000), Obehira (36,000), Okengwe (19,000), Kuroko (21,000), Ogaminana (31,000), Ogbeigba (23,000) and Ogboroke (24,000).

Okene which was established over 600 years ago had been the traditional headquarters of the Igbirras and since the creation of Kwara State, it became the administrative headquarters of Igbirra division. Okene now functions as administrative, cultural and educational headquarters of Igbirra division. Okene has long been recognised as a major craft centre specialising in hand woven cloth known as "Okene Cloth". Okene complex is about 70 kilometers west of Ajaokuta the proposed steel city.

The second type of settlements in this ranking order are Lokoja (35,000), Idah (36,000), Dekina (10,000) and Ayangba (17,000). All these settlements are local administrative headquarters, except Ayangba which is local at a nodal point.

Lokoja is located at the confluence of river Niger and Benue, a distance of about 40 kilometers up stream from Ajaokuta and about 70 kilometers North East of Okene Complex. It was founded in 1960 and at one time served as the Federal Capital of Nigeria. Due to diffult terrain.

poor communication and excessive heat, the town had not been able to expand as rapidly as it could have otherwise been. Lokoja is an important commercial centre and maintains large daily market that attracts thousands of traders and a big service centre. The only industrial establishment is the cotton ginnery.

Following the creation of states in 1967, the former Igala Division was splited up into Ankpa, Idah and Dekina divisions. The decision enhanced the status of both Dekina and Idah which had hitherto been district headquarters. Rapid developments in form of services and facilities have been the ~~rate~~ rule rather than the exception. Ayangba, though not an administrative headquarters, has also been developing rapidly due to its location and function as a major agricultural centre.

The third category of settlements are the minor rural farm centres located along the local roads from Okene to Ajaokuta and from Itobe to Ayangba. Also included in this category are the riverine settlements from Lokoja to Idah, 40 kilometers from Ajaokuta. Most of these settlements are less than 2000 in population and lack almost all types of facilities and services, including primary school. Ebiya (9000) is a major farm centre at about 22 kilometers

from Okene along Ajaokuta road. Ajaokuta (2289) itself is a rural settlement on the Western bank of river Niger. It is the administrative headquarter of Ajaokuta district. Across the Niger on the opposite side of Ajaokuta is Itobe (2000). Osara (3000) is the only settlement of significance along Okene - Lokoja road.

The riverine settlements, though very small in size with most of them less than 1000, are very important to the study. Most of them will be physically affected by the proposed steel plant. The most important of them are Geregu, Ganaja, Kporo Kpo, Ero, Dodongaji, Gbokoluba, Onado and Ejako.

The large centres like Okene, Lokoja, Idah, Dekina and Ayangba constitute the major centres of potential labour force for the steel complex. At the interim, they will also serve as the service and commercial centres for the steel complex. With the development of the proposed four lane route from Okene to Ajaokuta in the nearest future, Okene is likely to continue as the major supplier of services and facilities for the steel city. Okene will also continue to serve as regional headquarters until such a time that all necessary infrastructure are provided in Ajaokuta.

The lack of any major settlement in the vicinity of the steel complex is a major asset in disquise. This aspect leaves room for rational physical planning at grassroots and also limit the burden of resettlement which might have been associated with such industry. The sparsity of settlements in the central part of the region will enhance the development of agriculture to feed the expected population.

3.3 TRANSPORTATION:

The middle belt of Nigeria has long been identified with poor development of transportation networks. The only major roads and railway line pass through the area in a north-south direction, to connect the cotton, groundnut and tin belts of the North with the Cocoa and Palm nelts of the South. The roads and railways were contructed solely to ease evacuation of export crops to the coast with little regard for other aspects. Since there are no export crops from this region, there are no feeder roads to connect the major atteries as in the Cocoa belt of Western Nigeria. Unfortunately these policies continued unabatted long after independence until the 2nd National Development Plan in the early 70's. During this period Federal A2 roads were constructed to link Ilorin with Lokoja and Benin to Lokoja through Auchi and Okene . Across the Niger from Shintaku

RIVER BENUE

LOKOJA

OSARA

KPOROKPO

ERO

GEREGU

STEEL PLANT SITE

GANAJA

OKENE

EBIYA

TERUMENA

DOBOPAJI

AJAOKUTA

ITOBE

ADUMU

DEKINA

AYANGBA

ARAGBA

UNOMI

OFOKAFI

GWOLAWA

RIVER NIGER

250

500

750

1000

1250

LEGEND

Federal Roads

State Roads

Local Roads

Foot Paths

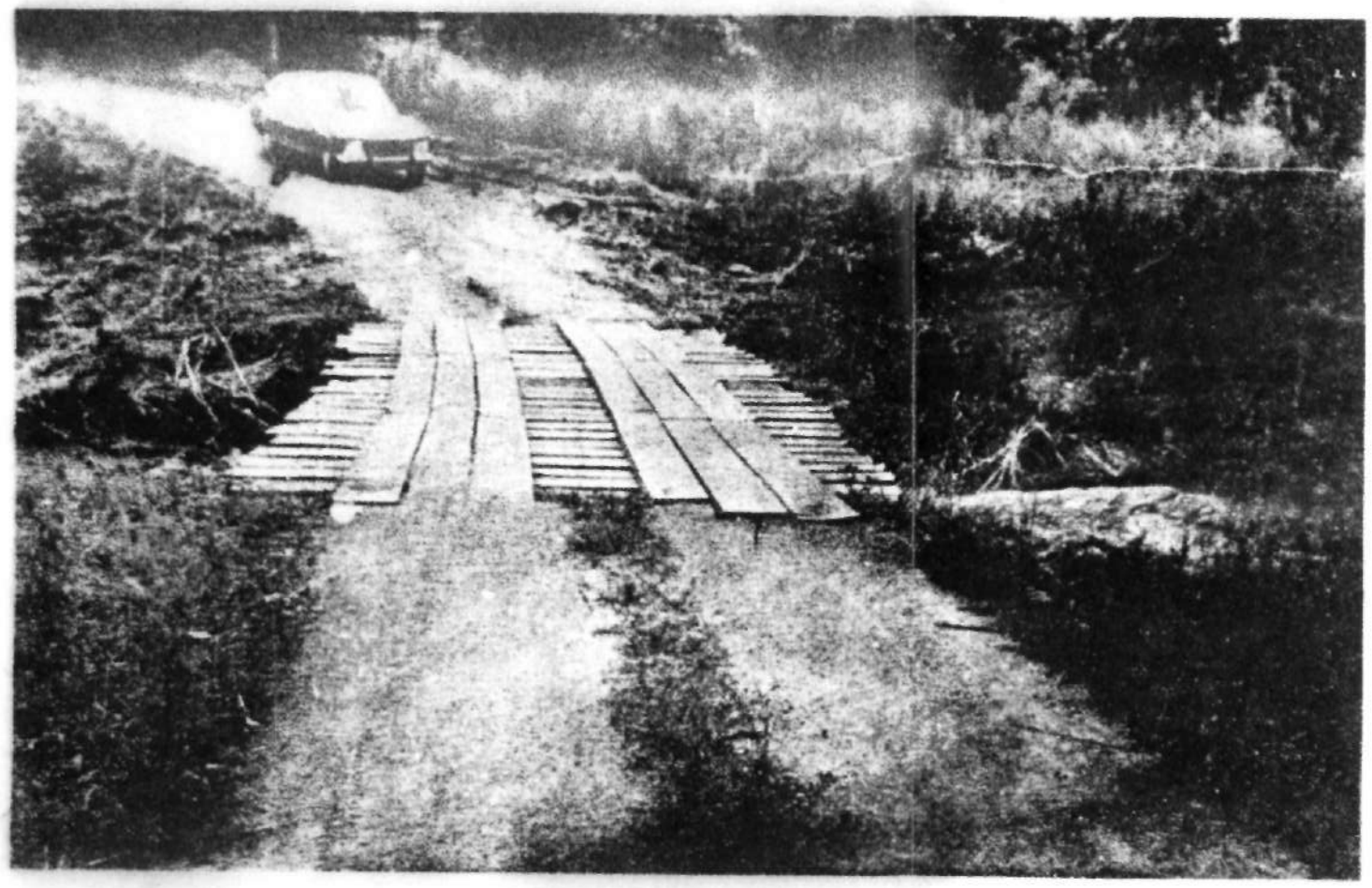
the road continued to Ayangba through Dekina. State road link Idah to Ayangba over a distance of about 72 kilometers.

TABLE III-III: ROAD PROVISION WITHIN THE REGION.

Type	Length	Width
Federal Roads A2	70km	Double lane
Federal Roads A2	80km	Single lane
State Roads	72km	Double lane.
Local Roads	190km	Single lane

The state governments have very recently took over some of the local roads which were formerly the responsibility of local governments. Therefore roads connect all the newly created administrative headquarters. Figure 3.3 shows the existing transportation networks in the region under study. The only paved roads are (a) Okene-Lokoja (70km), (b) Shintaku-Ayangba (80km) single lane (c) Ayangba to Idah (72km).

Seasonally motorable roads or local roads connect most of the farm and fishing settlements. Some of them are connected by only foot paths accessible to cyclists and



MODES OF TRANSPORTATION FIG 3-31

A TYPICAL EXAMPLE OF A WOODEN BRIDGE ALONG THE OKENE-AJAOKUTA GRAVEL ROAD. THIS BRIDGE IS HARDLY STRONG ENOUGH FOR THE WEIGHT OF HEAVY-DUTY VEHICLES THAT NEED TO DELIVER BUILDING MATERIALS TO THE CONSTRUCTION CAMP NEAR AJAOKUTA.

pedestrians only. The most important local roads are Okene-Ajaokuta (70km), and Itobe to Ayangba (60km). This single lane gravel road with wooden bridges is the only road connecting the proposed steel city and the rest of the world. Figure 3.3.1 illustrate the deplorable condition of this road that is hardly passable during the raining season.

On the whole the road density is about 1 kilometer to 1400 persons or 1 kilometer to 16 square kilometers. This shows gross inadequacy of the road system for the present population, not to think of future population and other activities that might be generated by the steel complex. Car ownership within the region is very low and it is limited to Okene, Lokoja, Idah, Dekina and Ayangba. It stands at about one car to 200 persons.

As earlier discussed this region is devoid of railway system and the closest railway station to Ajaokuta is Oturkpo (200km) on the eastern line. The Western line is about 400 kilometers away from the proposed steel city.

The development of airports in Nigeria follows the regional administrative headquarters which are Kaduna, Ibadan, Enugu, Lagos plus other major commercial centres like Kano. Most of the former provincial headquarters

have airstrips for emergency and military purposes. Since, no settlement in this region qualified for the provision of airport there is no airport in the region except for small airstrip which is 20km from Lokoja. Ilorin airstrip is currently undergoing expansion to bring it to International Standard. However, the distance of 400km from Ilorin to the steel plant may render it useless to the steel complex.

River Niger is navigable throughout the year in this region but the incidence of sand banks and low water level during the dry season make navigation hazardous to large boats and barges.

Potentially, the existing transport system are far from adequate to serve the proposed steel complex. However, the existence of perpheral roads form a major asset. since feeder roads can easily be constructed to join them. The river Niger, if dredged and well maintained constitute a major means of cheap transport for both the steel mill raw materials and products. The wide expanse of gently undulating landscape with sparse population augius well for future road development within the region.

3.4 INFRASTRUCTURE:

The availability of facilities and services like electricity, pipe borne water, health centres and schools are all positive manifestations of development. The lack or inadequacy of these facilities and services in the region under study therefore depicts the low level of development. Only Lokoja, Okene, Idah and Dekina which are local administrative headquarters are served with electricity from local plants and pipe borne water. Okene may soon be connected to National Power Grid Line from Benin.

It is a ~~padon~~ paradox of life that despite the presence of river Niger and other tributaries, there is no regular supply of water, even at Lokoja, the confluence town. Ajaokuta and other riverine settlements depend on river Niger, bore holes and brooks for their day to day water requirements.

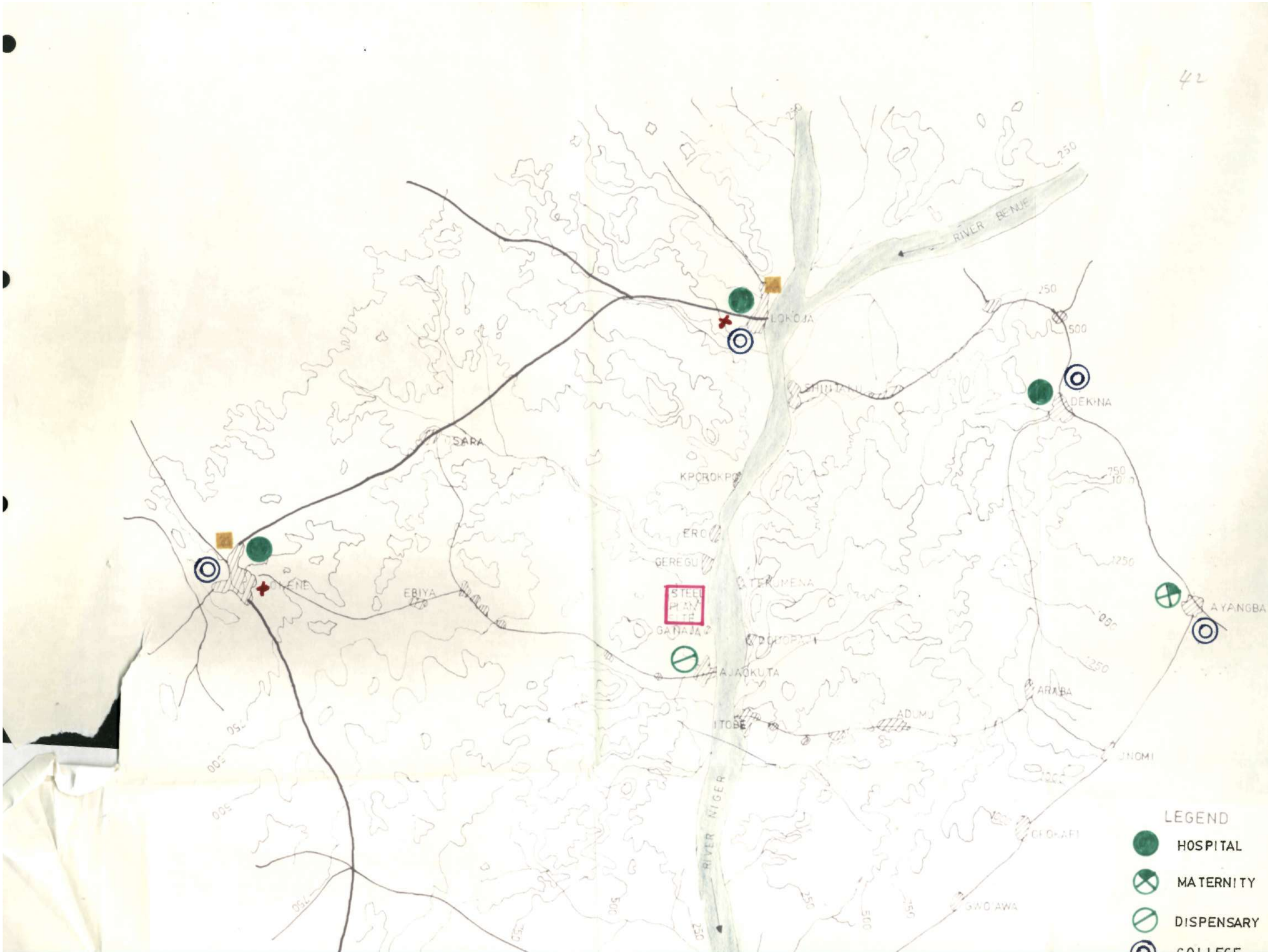

RIVER BENUE
LOKOJA
SARA
EBIYA
KPOROKPO
ERO
GEREGU
STEEL PLANT
GANAJA
AJAOKUTA
ITOBE
ADUMU
ARAGBA
AYANGBA
DEKINA
OKAFI
OMI
GWOAWA
RIVER NIGER
250
500
750
1000
1250
LEGEND
HOSPITAL
MATERNITY
DISPENSARY
COLLEGE

TABLE III-IV DISTRIBUTION OF SERVICES AND FACILITIES IN THE STUDY REGION.

Location	Types of Facilities/Services			
	Electricity	Pipe borne Water	Hospital	Colleges
Okene	△	△	△	△
Lokoja	△	△	△	△
Dekina	△	△	△	△
Idah	△	△	△	△
Ayangba	X	X	Maternity	△
Ajaokuta	X	X	Dispensary	X

N.B. △ = availability.
X = non-availability.

Table 3.4 and figure 3.4 shows the distribution of main facilities and services available in the study area. Health services are far from being adequate. Ajaokuta, has only a very small dispensary that operates thrice a week. The nearest hospital with a doctor is either Okene (70km) or Lokoja (40km) up the Niger.

With the planned extension of Kainji power line to Okene and Lokoja, it will not be difficult to extend the

main grid line to the proposed city. Water is readily available from river Niger which may either be dammed or diverted to a reservoir for the use of the steel complex.

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C H A P T E R F O U R.

REVIEW OF PROGRAMME OF DEVELOPMENT OF THE STEEL PLANT BY N.S.D.A.

4.1 INTRODUCTION.

This chapter deals with a number of crucial problems that are likely to affect the overall impact of the proposed steel complex in the region. These problems centred on development programmes of N.S.D.A. with respect to the steel mill. There have been many conflicting reports on the possible dates for the commencement of the project. The third National Development Plan stated that the commercial production is expected before the end of the plan period, whereas the N.S.D.A. believes that construction will start in 1980 and end in 1984. According to NISER's report, the construction was expected to start by 1976. The ~~war~~ crux of the problem lies with the Russian Technical Patners who up till now have not been able to produce final details of the mill and also the amount and sources of raw materials required by the project. However, there is consesous of opinion by various organs of the government that the preparatory stage will last about four years to be followed by initial production phase of about 550,000

tons up to 1.3 million tons. The sustained production phase will be carried out in stage from 1.3 million through 2.6, 3.9 and 5.2 million tons at intervals of about 3 years. The years stated by NISER's report for the various stages will be follwed in this study. Thus:

1976 - 1980 - Construction Phase

1981 - 1984 - Initial Production Phase

1985 - 1995 - Sustained Production Phase

4.2 PREPARATORY PHASE:

In the preparatory stage, (1976 - 1980) most of the work will either be done by N.S.D.A. or by contracting firms. Already contract have been awarded fof clearing of the site and removal of top soils. Errection of construction of the base was expected to have started by April 1977 and actual construction of the plant is due to begin by December 1977 and last a period of about three years. This construction phase is expected to attract between 17,000 and 20,000 workers. It is assumed that most of them will be trasitional workers without families and engaged by either N.S.D.A. or Contracting firms. However, there is likelihood that some of them will stay behind to work in the steel mill itself.

The table below shows the breakdown of the expected number of workers by N.I.S.E.R. during the preparatory stage (1976 - 1980). The figure for basic employment was supplied by N.S.D.A. For the purpose of anaysis, NISER assumed that a low income worker will have four dependants while middle and high income workers will have only ~~ten~~ two dependants each. This family size assignment is only acceptable if the assumed temporary nature of the estimated influx of 153,000 by 1980 or a total of 90,000 without dependants.

Table IV-I VOLUME OF IN-MIGRATION 1976-1980.

Type of Staff	Basic Employment	Dependent Family	Dependent Employment and Families	Job-Seekers	Total In-migration
Engineers and Higher Technicians (to supervise construction)	100	200	600	10	910
Engineers and Higher Technicians (to adjust construction)	250	500	3000	25	3775

.../cont'd.

Table IV-1 cont'd.

Type of Staff	Basic Employment	Dependent Family	Dependent Employment and Families	Job-Seekers	Total In-migration
Engineers and Higher Technicians(to supervise Projects)	950	2850	4750	95	8645
Officer Workers	500	1500	2000	167	4167
Construction and assembly workers	10,000	40,000	40,000	2,500	92,500
Transportaion and other services	4,000	16,000	16,000	1,000	37,000
Labourers and Security Guards	400	1,600	1,600	1,100	3,700
Russian Experts	300	600	1,800	-	2,700
Total In-migration	16,500	63,250	69,750	3,897	153,397

It is therefore unrealistic of N.S.D.A. to plan for only 12,000 by 1980.

4.3 INTIAL PRODUCTION PHASE - STAGE I.

Table IV-II below shows that during the initial production phase 1981-1984 about 10,000 basic workers are expected in the steel plant. According to NISER about 112,000 in-migrants are expected during this period. The high and middle income groups are assigned factor of four dependants while those in the intermediate and low income groups are assigned a factor of five and six respectively. The rational behind the assignment of these factors is not the subject of this study. However, it is necessary to mention that the factors are too low for high income group.

Table IV-II: VOLUME OF IN-MIGRATION 1981-1984.

Type of Staff	Basic Employment	Dependent Family	Services Employment and Families	Job-Seekers	Total
Executives and Engineers	500	2000	3000	50	5550
Foremen, Technicians	1,200	4800	7200	150	13350

..../cont'd

Table IV-II cont'd.

Type of Staff	Basic Employment	Dependent Family	Services Employment and Families	Job seekers	Total
Skilled Workers	3000	15000	15000	375	33,375
Semi-skilled Workers	2200	21000	11000	367	24,567
General Labour Grade	3100	18600	12400	775	34,875
Total In-migration	10,000	51,400	48,600	1,717	111,717

Source: NISER's Socio-Economic Studies of Ajaokuta.

4.3 From a study of six ~~steel~~ steel towns carried out in India by K.T. Sriniwasan, a regression equation $y = 7.3 + 8.3x$ was derived to relate the amount of steel production to number of workers.

From the above equation

y = number of steel workers in thousands.

x = production in million tons.

By applying this equation to the proposed production

at the initial stage the following figures were obtained. Thus when production is 550,000 tons per annum.

y = (7.3 + 8.3 x 0.55) thousands

= (7.3 + 4.565) thousands.

= 11,865

or No. of basic workers = 11,865.

This estimate is in agreement with that predicted by N.S.D.A. which is about 10,000.

From the same study some ratios were computed to relate the number of basic workers to other types of people in the steel city. These ratios are given below.

(a) $\frac{\text{Population of Steel city (P)}}{\text{No. of Steel Workers (S)}} = 8.72$

(b) $\frac{\text{Population of Steel City (P)}}{\text{Total No. of Workers (W)}} = 3.3$

(c) $\frac{\text{Population of Steel City (P)}}{\text{No. of Other Industrial Workers (I)}} = 10.85$

(d) $\frac{\text{Total No. of Workers (W)}}{\text{Other Industrial Worker (I)}} = 3.38$

(e) $\frac{\text{Other Industrial Worker (I)}}{\text{Steel Plant Workers (S)}} = 0.99$

Using the first ratio P/S = 8.72 to calculate the city size by 1981, it was found to be P = 8.72 x 11,865

= 103,463.

This figure is almost in agreement with the thumb rate estimate of the N.S.D.A. NISER's estimate of 112,000 ~~kg~~ workers for period 1981-1984 inclussive.

By 1983 when the intial phase might have reached maximum production of 1.3 million tons a city of 157,745 persons is expected to develop. This figure was arrived at by using the same ratio as above. The total number of basic steel workers was calculated to be 18,090.

Using the ratio $\frac{I}{S} = 0.99$

where I = Industrial Workers other than steel Workers.

S = Steel Workers.

The number of other industrial workers expected was calculated to be 17,909.

If one basic employment generates 1.5 other jobs then the number of service workers will be equal to 18090 x 1.5 or 27,135 service workers.

4.4 SUSTAINED PHASE:

During the sustained phase the output will vary between 2.6 million tons to 5.2 million tons. NISER envisaged only 50 per cent increase in labour force. Though production is expected to increase by 300 per cent. On this basis, a total population of only 168,000 for the steel city was predicted.

The table below shows the breakdown of the population.

Table IV-III VOLUME OF IN-MIGRATION 1985-1995.

Type of Staff	Basic Employment	Dependent Families	Service Employment and Families	Job seekers	Total
Executieve and Engineers	750	3000	4500	75	8325
Foremen, Technicians and Higher Operators	1800	7200	10800	225	20025
Skilled Labour	4500	22500	22500	563	50063
Semi-skilled labour	3300	16500	16500	550	36850
General Labour	4650	27900	18600	1163	52313
Total	15000	77100	72900	2576	167576

Source: NISER's Socio-Economic Studies of Ajaokuta Area.

4.4.1 Since the expected increase in production during this phase is in stages and covered a period of about 10 years it was thought logical to break it down to three stages for the purpose of analysis.

During the sustained phase, stage I which is expected by 1987, the output of steel will be 2.6 million tons. By applying the same equation as at the initial phase, the unmber of steel workers is expected to be 25,000. Total number of other industrial workers was calculated to be 25,000 and 0.99 or 24,750 workers.

The assumed ratio of 1:1.5 for the number of basic workers to service workers was employed to determine the number of service workers. This is calcualted to be 25,000 x 1.5 = 37,500. From the ration already explained the city is expected to have reached 252,000 people.

4.4.2 By 1991, the second stage of the sustained phase, production is expected to have reached 3.9 million tons annually. Using the regression equation $y = 7.3 + 8.3x$ as already explained, the number of steel workers was calcualted to be 39,400. If the assumed rate of growth for ~~annualliary~~ auxilliary industry ~~contained~~ continued, then the expected number of workers in this sector will be 0.99 x 39400 = 38600 workers. (39006)

By the same criteria as before, the service workers will be 39400 x 1.5 = 59,100.

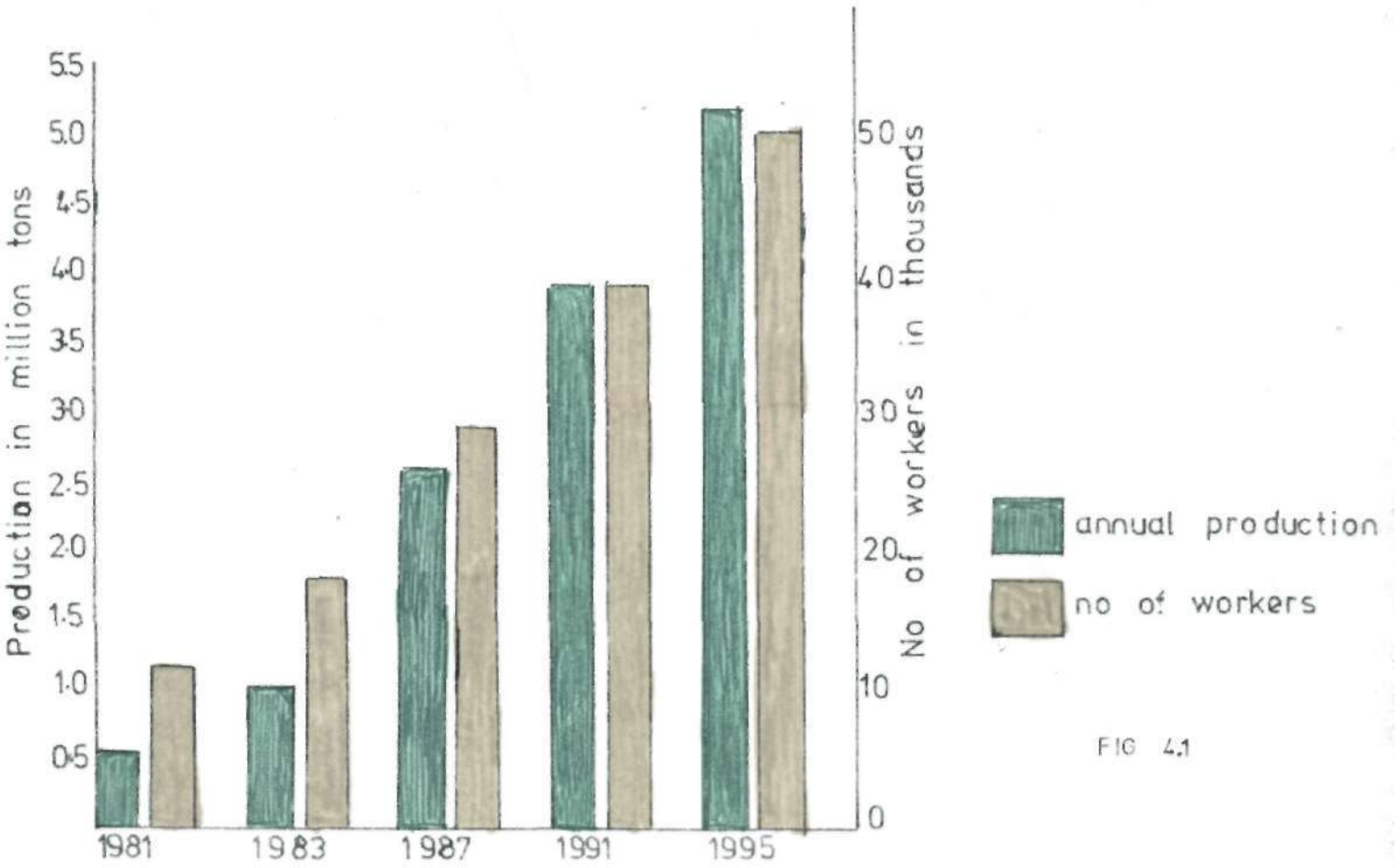


FIG 4.1

RELATIONSHIP BETWEEN PRODUCTION AND NO. OF WORKERS

The city size was calculated to be 348,000 at this period.

4.4.3 At the full capacity stage which is expected by 1995, the output of steel will be 5.2 million tons. About 450,000 inhabitants will be expected to reside in the steel city, including 50,000 basic workers and 75,000 service workers. All the above calcualtions are summerised in the table below.

Table IV-I[V]: ESTIMATED IN-MIGRATION 1976 - 1995.

Stage	Period	Estimated Production (million tons)	Estimated Basic Workers	Other Industrial Workers	Service Workers	Expected City Population	Area Required
PREPARATORY	1976-80	-	16500	-	24750	15300	1913
INITIAL PRODUCTION STAGE I	1981	0.55	11865	11746	17800	103000	1290
INITITAL PRODUCTION STAGE II	1983	1.3	18090	17909	27135	158000	1975

...../cont'd.

Table IV-IV cont'd.

Stage	Period	Est-mated Prod-uction (mill-ion tions	Esti-mated Basic Worker	Other Indus-trial Workers	Serv-ce Work-ers	Expected City Popula-tion	Area Req-uired
SUSTAINED PHASE STAGE I	1987	2.6	25000	24750	37500	252000	3150
SUSTAINED PHASE STAGE II	1991	3.9	39400	39006	59100	34800	4350
FULL CAPA-CITY	1995	5.2	50450	49946	75000	440000	5500

Source: Projections as explained in the text.

Though the figures ~~calcualted~~ calculated in the above table appeared too exaggerated, it is in agreement with that arrived at by U.O. Ukwogu in his M. Sc. Thesis on steel city in Kwara State

His estimate for year 2005 is 520,000 people for the steel city. However, distortion to the above calculations might have steamed from the assummed rate of auxiliary industries. Some depedants of the steel workers may also be engaged in service employment. This invariably result in double counting.

4.5 MIGRATION:

An examination of the literature on migration trend in Nigeria showed that :-

(a) The length and volume of migratory flows vary with the size of the city of absorption. The largest and longest, flow into largest city or focal point of industrialsing region such as Kano and Lagos.

(b) Industralising region experiences massive influx of people.

(c) Migration depends on number and the nature of intervening opportunities.

(d) Migration depend on certain socio-cultural and economic factors.

(e) Migration is a function of transportation network.

All the above theories are too generalised to be of any use in predicting sources of labour force for the steel project. The distance that would-be migrant is willing to travel from home depend on the nature of job, renumerations and availability of similar jobs in his local area. By the same arguement, it is very unlikely that the semi-skilled and general labour force requirements of the steel works will attract people beyond the study area.

There is acute shortage of intermediate manpower throughout the country, especially in the technological field required for a steel mill. This problem is further aggravated by lack of similar work any where in the whole of Nigeria from which workers could be attracted. For the immediate requirements of the plant, there ~~most~~ must be massive training of our teeming school leavers. It is advocated here that the new Federal Government College of Technology at Idah should specialise in ~~meallargy~~ metallurgy and other related disciplines. The establishment of steel related Technical School at Ajaokuta should be given priority by N.S.D.A. Though high level manpower is in short supply throughout the country, it is hoped that the massive educational programmes embarked upon by the Federal Government in our universities will meet this shortage.

4.6 As discussed in the last chapter only 10 percent of the population in this areq recieved one form of basic education or the other. It is reasonable therefore to assume that the region under study will supply only the semi-skilled and general labour at the initial stages of production. The requirements for this category of labour force is about 15000 during the construction phase but at the initial production phase, the requre-ment will vary from 5000 to 8000 workers. For purposes of analysis the number of labour force will be regarded as the attractive force to the steel city.

Almost all the viyile population in the villages that will be resettled are likely to abandon farming and take up paid employment in the steel mill. From the survey carried out by NISER only about 5 percent of the working population are satisfied with their pre-sent occupation.

The hypothesis formulated by E.C. Young (1924) to estimate migration from different sources, stated that the relative volume of migration to a given destination from each of the several sources varies directly with

the force of attraction of the destination and inversely as the square of the distance between the source and destination,

$$\text{i.e} \quad iMj = \frac{KZi}{Dij^2}$$

where iMj = migration from station j to destination i

2i = the force of atteaction at i

Dij = distance between source j and destination i

K = constant of proportionality related to size of source j.

When this formular was applied to the study area, the following estimated were arrived at for different sources.

(a) From Okene

$K = 251000^{\frac{1}{2}}$

2a = 8000 (No. of Job opportunities)

daj = 57 km.

$$\therefore aMj = \frac{\sqrt{251000 \times 8000}}{3249}$$

= 1234 migrants

(b) From Lokoja

$K = 35000^{\frac{1}{2}}$

$2a = 8000$

$daj = 40km.$

$$\therefore aMj = \frac{\sqrt{35000} \times 8000}{1600}$$

$= 935$ migrants.

(c) From Dekina

$K = 10000^{\frac{1}{2}}$

$2a = 8000$

$daj = 70km.$

$$\therefore aMj = \frac{\sqrt{10,000} \times 8000}{4900}$$

$= 163$ migrants.

(d) From Idah

$K = 36000^{\frac{1}{2}}$

$2a = 8000$

$daj = 40km.$

$$\therefore aMj = \frac{\sqrt{36000} \times 8000}{1600}$$

$= 498$ migrants.

(e) From Ayangba

$$K = 17000^{\frac{1}{2}}$$

$$2a = 8000$$

$$daj = 60 \text{ km.}$$

$$\therefore \quad aMj = \frac{\sqrt{1900 \times 8000}}{3600}$$

$$= 289 \text{ migrants.}$$

The above calcualtions show the likely extra migrants from different settlements, if the assummed job opportunities of 8000 is correct. If however, more vacancies are created by other auxillliary industries or service employment, more migrants would be expected in the same proportion. Transport facility may also distort the estimated number of migrants. The calculation above assumed equal access and information opportunities to all would-be migrants.

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PART THREE

CHAPTER FIVE

ASSESSMENT OF THE IMPACT OF THE STEEL COMPLEX ON THE REGION

5.1 INTRODUCTION.

This Chapter will evaluate and document as much as possible in both quantitative and qualitative terms, the impact of the proposed integrated iron and steel complex at Ajaokuta as manifested by future changes in population, settlement patterns, Transportation networks, level of infrastructure and quality of environment. Reilly's Law of retail gravitation as developed by P.D. Concerse in his 'breaking point' formula will be used to determine the change in attractive force of Ajaokuta along the various roads. These assessment will be based on year 2000 when it is hoped that the project would have reached maximum production stage. Intervening changes between now and that time will also be given adequate consideration.

5.2 POPULATION

The first noticeable impact that will be experienced within the region in a relatively short period is rapid increase in population. Ajaokuta, a village of under 3000 people will be transformed into a town of over

RIVER BENUE

LOKOJA

SHINTAKU

DEKINA

OSARA

KPOROKPO

ERO

GEREGU

TERUMENA

STEEL PLANT SITE

BAKANA

OOPAJI

AJAOKUTA

ITOBE

ADUMU

ARABA

AYANGBA

UNOMI

OFOKAFI

GWO'AWA

OKENE

OKENE COMPLEX

EBIYA

RIVER NIGER

250

500

750

1000

1250

LEGEND

500,000

250,000

100,000

50 000

10,000

100,000 within a period of 4 years. This gives about 160 per cent annual rate of increase. It is very unlikely that most of the im-migrants could be accommodated at Ajaokuta itself but rather a restructuring of the population within the commuting zone of the steel complex is expected.

By the year 2000, the present Igbirra division would have grown to about 1,200,000 people as against the present 300,000. This gives 5 per cent annual rate of growth as compared with the whole of Kwara State which is 2.35 per cent per annum. The existing density of 130 persons per square kilometer will be increased to 360 persons.

At the moment Okene complex alone accounts for about 80 per cent of the total population for Igbirra division, but by the year 2000, it will account for only 53 per cent. The proposed steel city will rise to about 35 per cent from the present state which is less than one percent of Igbirra division. The general trend of the population will shift from the present illitrate farming population to urbanised and industrialised society with at least two major concentrations around Okene and Ajaokuta. Figure 5.1 shows the sizes

of various centres by year 2000 as compared with the present sizes. Table V - 1 below also show the population of the settlements by year 2000.

TABLE V - 1 - POPULATION OF SETTLEMENT BY YEAR 2000

CITY/TOWN	PRESENT SIZE (1976)	FUTURE SIZE (2000)
Okene	251,000	700,000
Ajaokuta	2,289	265,000
Lokoja	35,000	150,000
Ebiya	9,000	62,000
Koorokpo	1,200	90,000
Itobe	2,000	49,000
Idah	36,000	66,000
Ayangba	17,000	31,500
Dekina	10,000	20,000

The influence of the new population concentration at Ajaokuta was determined by using P.D. Converge 'breaking point' formular. Briefly the equation states that

$$Da = \frac{Dab}{1 + \sqrt{\frac{Pb}{Pa}}}$$

Where Da = Distance from Centre A to breaking point in Km.

Dab = Distance between Centres A and B.

Pa = Population of Centre A

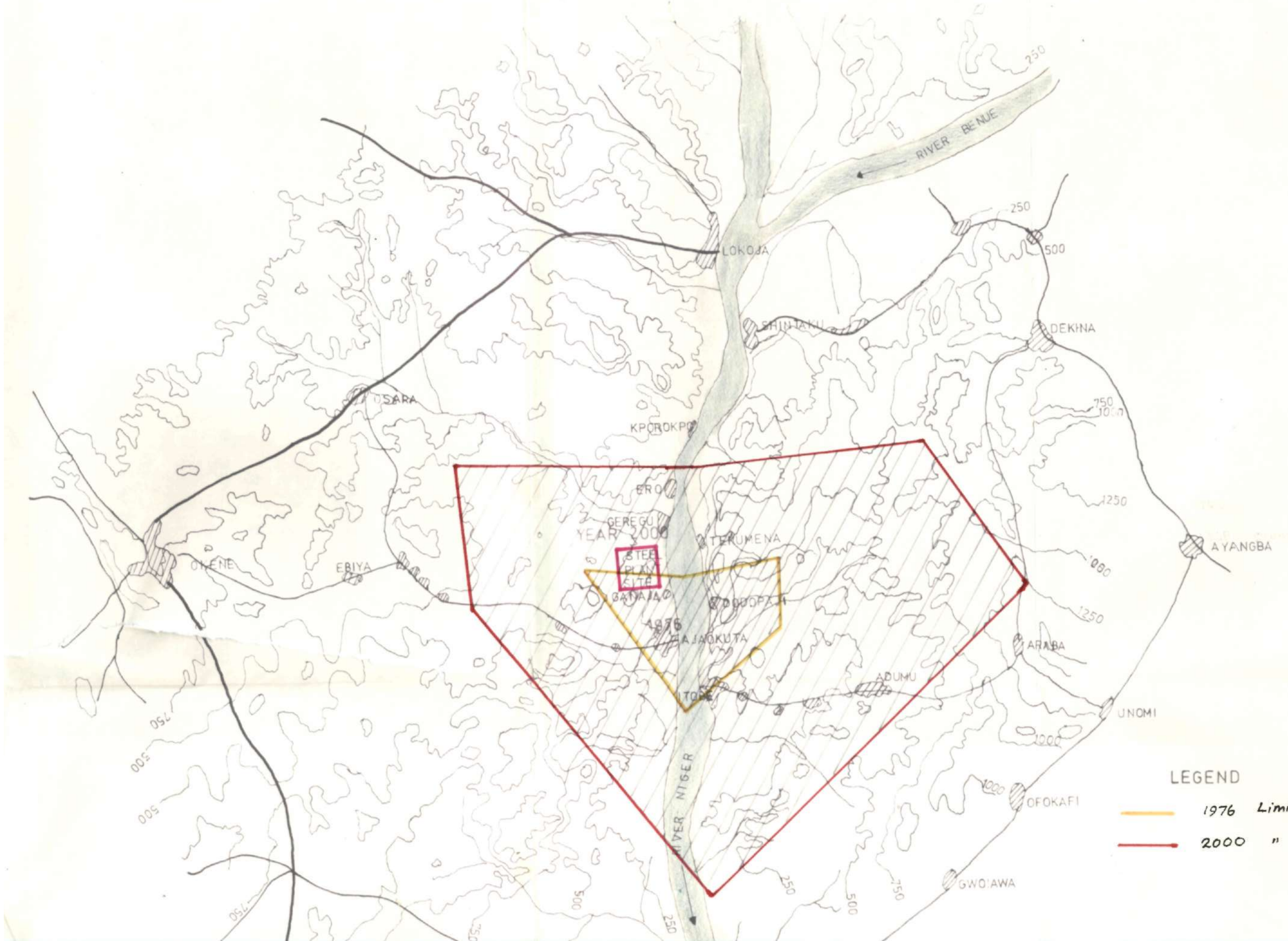
Pb = Population of Centre B.

If the distance between Ajaokuta and Okene Dab is 70 km and the population of Ajaokuta and Okene by year 2000 are 265,000 and 700,000 respectively. Then the breaking point from Ajaokuta along Okene road is given by

$$Da = \frac{70}{1 + \sqrt{\frac{700,000}{265,000}}} = \frac{70}{1 + 1.63} = \frac{70}{2.63}$$

∴ Da = 26.6 kilometers.

The distance is more than the present distance of only 6.1 km. This readily shows that attractiveness of Ajaokuta would increase many folds by year 2000. The same technique was applied to all other major centres within the region. The table below shows the relative

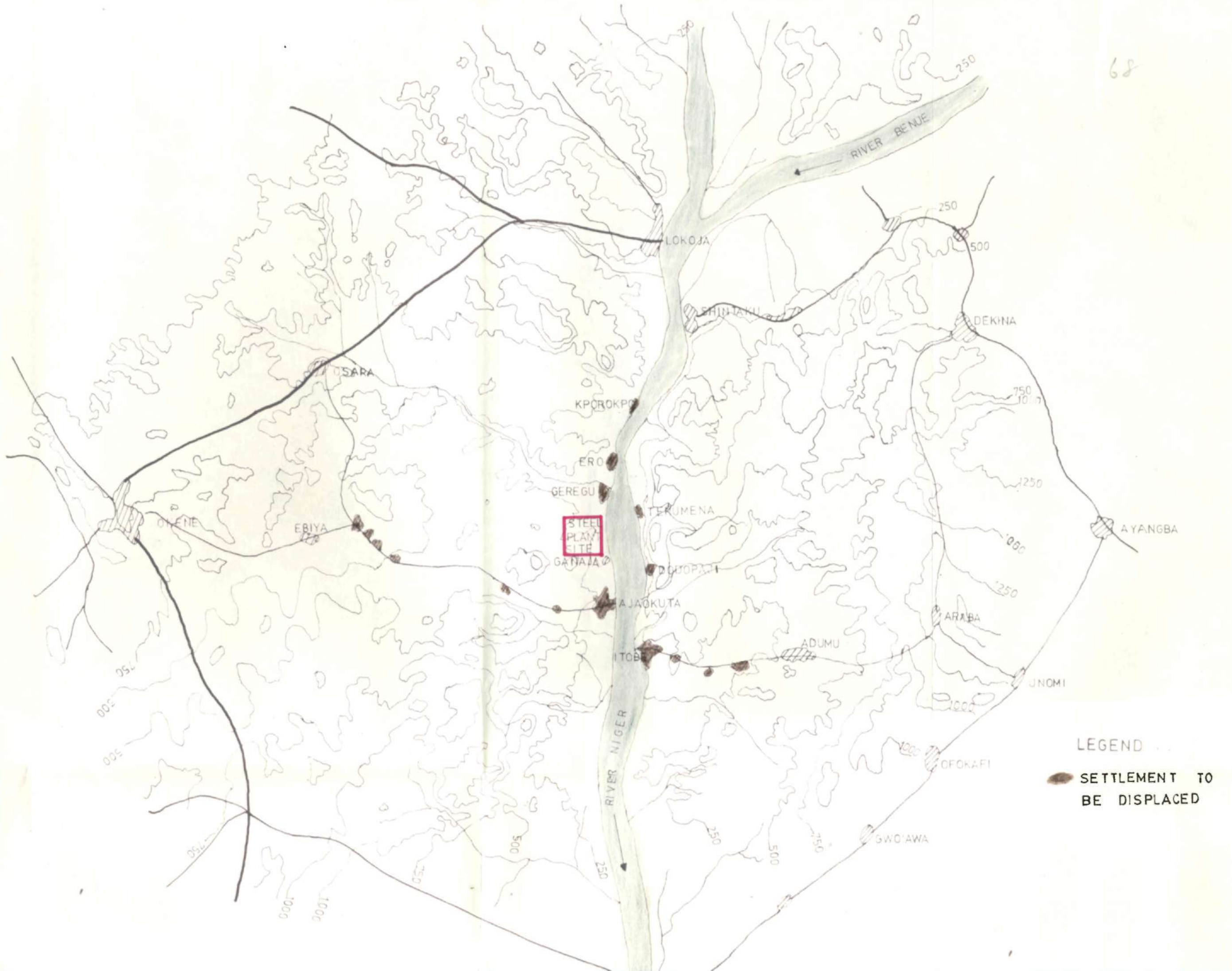

RIVER BENUE
250
LOKOJA
250
500
SHINTAKU
DEKINA
OSARA
KPOROKPO
ERO
GEREGU
YEAR 2000
STEEL PLANT SITE
AJAOKUTA
1976
ITERUMENA
OKENE
EBIYA
ITOBE
ADUMU
ARAGBA
AYANGBA
UNOMI
OFOKAFI
GWOLAWA
RIVER NIGER
750
1000
1250
LEGEND
1976 Limit
2000 "

changes in 'breaking point' by year 2000 for some settlements. The same result is shown diagramatically by figure 5.2

TABLE V - H : BREAKING POINT FROM AJAOKUTA TO SOME SELECTED URBAN CENTRES BY YEAR 2000.

FROM	TO	Dab	Da (1976)	Da (2000)
AJAOKUTA	Okene	70 km	6.1	26.6
	Lokoja	40 km	8	23
	Osara	38 km	13	32
	Ayangba	60 km	16	39
	Dekina	70 km	22	37
	Idah	40 km	8	28

It is important to stress here that this calculation is not designed to delimit sphere of influence of Ajaokuta but rather to explain the impact created by population inflow to the Steel City.


RIVER BENUE
LOKOJA
SHINTAKU
DEKINA
AYANGBA
SARA
KPOROKPO
ERO
GEREGU
TERUMENA
STEEL PLANT SITE
GANAJA
AJAOKUTA
ARABA
ADUMU
ITOBO
UNOMI
OFOKAFI
GWOLAWA
RIVER NIGER
OKENE
EBIYA
250
500
750
1000
1250
LEGEND
SETTLEMENT TO BE DISPLACED

5.3 SETTLEMENT PATTERNS

Settlement patterns is a function of human activities which may either be permanent or temporary. Thus the construction of high way require only transitional camp while large mining operations as in Jos area may require a more permanent settlement.

The establishment of the proposed Iron and Steel Complex at Ajaokuta will drastically affect the settlement patterns within the region. The Impact will be more pronounced within the radius of about 20 km of the Steel project. The impact will take the form of physical removal of some existing settlements, rapid growth of some other villages to take care of spill over population and establishment of New Towns. Figure 5.3 shows the settlements that will be physically displaced by the Steel project.

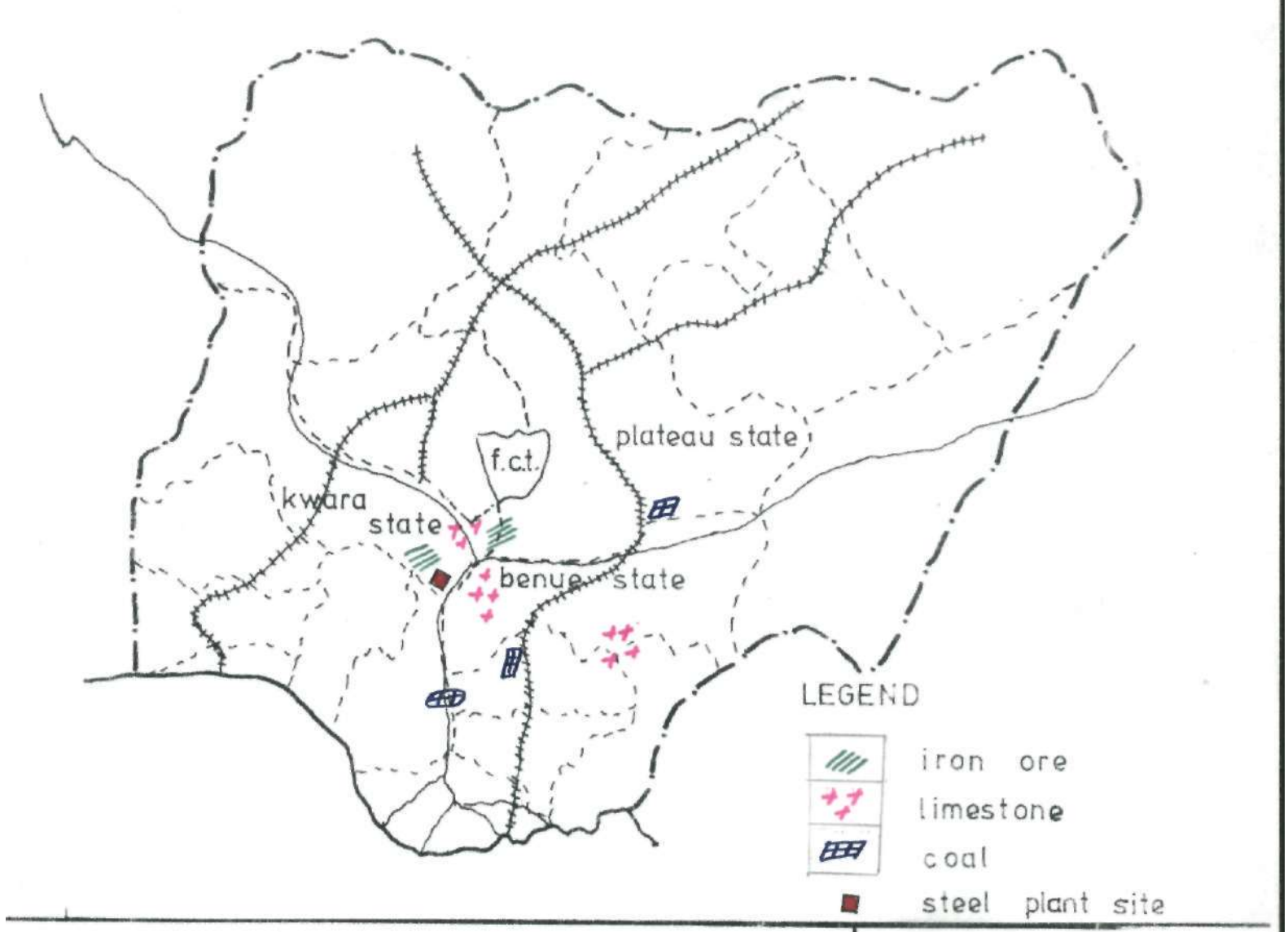
The decision of N.S.D.A. to locate the steel plant at a place 4 km north of the present site of Ajaokuta will necessitate the displacement of the following villages; Ajaga, Agumagu, Ohuneme, Ajaokuta and Geregu. The total population of all these settlements is about 6000 people. The construction of the proposed dam between

Ero and Gbaraga will result in flooding of Ero, Ghanaga, Kporokpo as well as Egba and Kogi villages in Benue State. Adequate survey should be carried out to determine the exact number of people that would be affected.

The construction of the proposed Okene - Ajaokuta road, which is hoped to run parallel to the existing laterite road, and the rail-road bridge at Ajaokuta, will result in destruction of some settlements like Ebiya, Unosi, Adogo, Idibo and Itobe. Even if all these settlements are not affected by road construction, the general tendency to settle along the highway will result in local migration of the existing settlements.

The large influx of people within a relatively short period coupled with displacement of some settlements will lead to phenomenal increase in some existing settlements within the commuting zone. Okene in particular is likely to harbour some of the workers family during the initial stages. The expected rate of growths will be discussed under the proposals.

The present functions of most of the neighbouring villages as rural farm centres will give way to new industrial towns. The construction of the proposed



A JAOKUTA STEEL PROJECT

SOURCES OF RAW MATERIALS

highways will open up all the country side that were hitherto cut off from the rest of Nigeria.

The mining of iron ore from Itakpe hills (9 km from Okene) is likely to attract about 1,500 workers while the quarry of limestone will require about 500 workers with at least additional 500 to transport it. The coal mine that will be established at Lafia in Plateau State will similarly attract about 1,500 miners. All these new mining and quarry centres will result in establishment of new settlements. If the ratio of one basic worker to five of the total population is assumed, then, Iron Ore Mining will require a settlement of about 7,500 people while the Limestone quarry will support a village of about 5,000 people. Figure 5.4 shows the sources of raw materials and likely location of settlements.

From the foregoing, it can be readily comprehended that a new order of settlement patterns will result from the establishment of the proposed Iron and steel Complex. The details of the proposed pattern will be discussed in the next chapter.

5.4 TRANSPORTATION NETWORKS:

The existing transportation patterns have already been discussed in chapter three. It was shown that both the quantity and quality was inadequate to serve the demands of the proposed steel works. The movement of goods and people in the region will increase dramatically in the nearest future due to location of steel complex and Federal Capital just north of the area under study. The possible re-location of settlements and creation of new activities will generate new demands for transportation facilities.

Bulk quantities of coal, iron ore, limestone will be brought to Ajaokuta and heavy steel products would be exported from the region. Coal is likely to come from Lafia while Iron Ore is expected from Itakpe hills near Okene. It is assumed that local deposit of limestone will be used during the initial stages, therefore there will be the need to transport it from Jakura hills (about 35 km north of Lokoja) to the Steel plant site. Manganese and other heavy machines will be brought in from the Coast along the Niger. The degree of daily commuting around the proposed steel city will increase greatly to cater for factory workers.

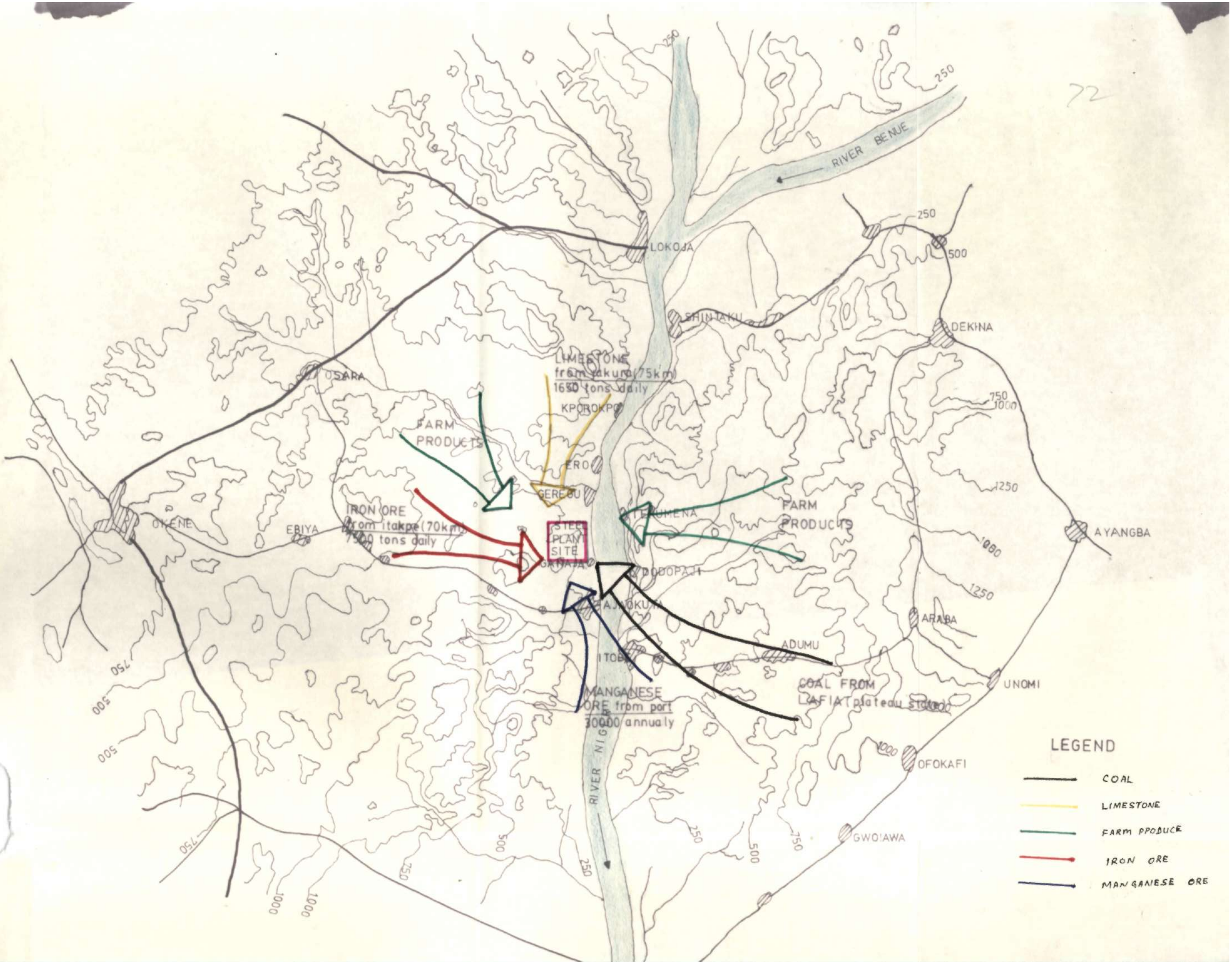

RIVER BENUE
LOKOJA
SHINTAKU
DEKINA
AYANGBA
USARA
OKENE
EBIYA
KPOROKPO
ERO
GEREGU
ITAKPE
GBAJA
DOGOPAJI
AJAOKUTA
ITOBO
ARAGBA
ADUMU
UNOMI
OFOKAFI
GWOLAWA
LIMESTONE from Ukpilla (75km) 1680 tons daily
FARM PRODUCTS
IRON ORE from Itakpe (70km) 7500 tons daily
STEEL PLANT SITE
MANGANESE ORE from port 30000 annualy
COAL FROM LAFIA plateau STORE
RIVER NIGER
250
500
750
1000
1250
1080
LEGEND
COAL
LIMESTONE
FARM PRODUCE
IRON ORE
MANGANESE ORE

TABLE V - III EXPECTED ANNUAL INPUT OF STEEL PLANT AT 1.3 MILLION TONS OUTPUT

INPUT	TONNAGE	SOURCE
Iron Ore	2½ - 3 million	Itakpe
Limestone	500,000 - 700000	Jakura
Bricks	60,000	Kwara State
Scrap	100,000	Various Locations
Manganese Ore	30,000	Ports
General Stores	80,000	Ports/Various location.

The Magnitude of the input required can better comprehended if one assumes that they are all transpoted by rail to the plant site. For example about 15 trains carrying a load capacity of 500 tons each will be required per day to supply the steel works with Iron Ore alone. This result in a daily ~~hardlerge~~ haullage of 7,500 tons! Similarly limestone will require daily average supply of 1,650 tons.

Figure 5.5 shows shematic diagram of transportation desimes. The details of the proposed transport networks will be discussed later.

A feasibility study has been completed for a new railway line from Oturkpo on Port-Harcourt - Jos line to connect Ajaokuta over a distance of about 200 km. Construction is expected to be completed by 1980 to meet the target date for the commercial production of iron ore. This line will take care of coal transportation from Lafia to the plant site. Contract have also been awarded by Federal Government for the construction of a four lane road to connect Ajaokuta and Okene. The road will continue to Ayangba in Benue State over a bridge accross the River Niger.

At least about 180 kilometers of intencity roads will be added to the existing road networks in the region by year 2000. The road density will consequently increase from the present 1 km of road length to 16.6 square kilometre to 1 km of road length to 8.6 sq. km.

The future car ownership was predicted by using the linear equation developed by the World Bank and based on statistical survey of many cities in developing countries.

$$Co = 5.32 + 0.059Y$$

where Co = Car ownership per 1000 population

Y = per capital income in U.S. dollar. For

ease of calculation Y is assumed to be 800 dollars as predicted by the 3rd National Development Plan for year 1995.

$$\text{Thus } Co = 5.32 + 0.059 \times 800$$
$$= 5.32 + 47.2$$
$$\therefore Co = 52.52 \text{ cars}$$

or one car to 20 persons.

The recent take over of Central Water Transportation company by the Federal Government will enhance the quality of river transport along the Niger. The Federal government can afford the large capital investment required by the company and for the maintainance of the river channel. The company will compliment the efforts of N.S.D.A. to transport heavy equipments and materials to the steel complex site from the coast. The construction of a new bridge across the Niger from Lokoja to Koton-Karfe to link the Federal Capital territory with drastically increase the volume of regional traffic in the area especially from Ondo and Bendel States.

5.5 QUALITY OF ENVIRONMENT

This disecussion will be centred on the possible sources of environmental degeneration and also ~~expatrite~~ expatriate

on some measures that have been successfully employed elsewhere. The applicability of these measures with respect to the study area will also be discussed.

Any industrial activity is bound to affect the quality of environment but the degree vary with the nature and location of the industry. The need to analyse environmental impact of an industrial project was clearly brought out by the following examples of environmental degeneration. The giant wood-pulp plant set up near Proto Alerge in Brazil without adequate appraisal resulted in excessive water pollution and unpleasant odour from sulphur dioxide. This led to constant outcry of Brazilian Press and creation of special Secretariat for the environment. In Japan, Iron and Steel was found to contribute about 19 per cent of total sulphur dioxide emitted in 1970. It also accounted for 3 per cent of Biochemical Oxygen Demand (BOD) in water. BOD is a measure of water pollution and it is calculated on the basis of its content per unit of water. About 194,000 hectares of agricultural lands was damaged in addition to a loss of about ₦18 million from fish industry. The river Rhine that once inspired poetry and romance for its beautiful scenery is now virtually a sewer to Ruhr

industrial Complex which produces about 1.5 million tons of dust, smoke and ashes plus 45 million tons of sulphur diosude annually.

5.51 DUST, SMOKE AND PERCOLATE MATTERS

It has not been ascertained as to the total emissions of fuel and other related waste products associated with Steel works. However, it has been confirmed that all these pollutants are factor of time, location and composition of raw materials. Various types of emissions emanate from Steel plants at different stages of production but the following deserves special mention.

a. Ore-dressing - dust ant waste gases from sinter plants.

b. Steel works = Red fumes, sulphur chloride from oil fired open hearth furnce

c. Rolling mills = Waste gases containing sulphur diorude from oil fired heating furnacres.

Dust emissions has been greatly reduced in mordern steel works due to ore dressing, but this has resulted in increase emission from sinter plants.

5.52 WASTE WATER

After mining and chemical industries, iron and steel ranks next with respect to water intake. The water is subjected to inorganic and thermal pollutions only except for waste water arising from cooking plants, sanitary facilities and emulsion systems. The amount of pollution depend on the BOD it creates per unit of water and the amount of water it discharges. It has been empirically determined in Japan that Steel Works creates 10 BOD per unit of water. This figure may be applied to the proposed steel plant to determine future amount of pollutants from water.

In some technologically advanced countries, this problem has been greatly reduced by recirculation of water and treatment of the remaining ones. The availability of large quantity of fresh water around the proposed steel industry may not make it economically sound to re-circulate water, but adequate treatment must be given to used water before it is discharged into the river.

5.53 NOISE:

Noise constitutes a nuissance which, though common to all industrial activities, is of particular importance in the metal industry. It is caused by high speed Blowers

and forging hammers during the shapping operations and by metallic plates dropped on roller tables. The noise can hardly be reduced without incurring too much cost and sonsuming too much space. Traffic generated as a result of the steel complex especially during the loading of heavy metallurgic products into the railway waggons.

There is clear evidence that exposure to noise of sufficient intensity and duration can (a) permanently damage the inner ear with resultant permanent hearing losses.

(b) interfere with speech communication and perception of auditory signals. The maximum bearable noise degree is 30 - 45 phones for a working hall but metal smelting factory produce over 105 phones. Some measures have proved successful towards reducing noise in the neighbourhood of steel plants. Regulations and guidelines are given to machine manufacturers which specify certain basic principles on machine and plant noise level. The use of accoustic absorbers have also been applied as factory designs to reduce noise. However, noise from forging hammers and falling billets is still beyond contrd .

5.54 Environmental degenation will result from old mines and quarries. Large hectares of farm lands and forest reserve will be destroyed by heavy machineswhich will invariably bead to gerious erosional problems. About one million tons of stag and rubbish is expected from the proposed steelworks annually. This large amount can be used in filling old quarries and mines. The uncontrolled destruction of environment that resulted from Tin mining on Jos Plateau should not be allowed to repeat itself. Many open trenches of about 10 meters deep dotted the tin fields without any attempt at their relaimation. N.S.D A. should, in conjuction with forestry Division of States Ministry of Agriculture embark on massive land relaimation as soon as operation starts.

5.6 INFRASTRUCTURE

The establishment of the proposed iron and steel complex will necessitate the extension of services and facilities to an otherwise neglected region. New roads will be constructed, while old ones will be rehabilitated. Railway services will be extended to the area to facilitate transportation of raw materials and finished products.

5.61 ELECTRICITY

One of the most important services to be provided in the region is electricity. It has been estimated by Hawaz that in a blast furnace industry, annual consumption of electricity per worker is 60,000 kwh. If the proposed steel compex engages 10,000 workers at the initial stage, then total annual consumption of electricity expected will be 600 million kwh. There is a plan to extend at the National Eledtric grid line from Kainji to Okene. The project will be completed by the end of this year. From Okene, it will be easy to extend the line to Ajaokuta and other centres.

5.62 WATER SUPPLY From Hawas study of Industrial Centres and workers housing, it was discovered that a worker consumes about 1,000 litres of water per day in blast furnace Industry. This gives an average of about 10 million litres per day for the steel township. The NSDA have planned to construct a dam at Ero to supply the required amount of water to the factory and the township.

5.7 AUXILIARY INDUSTRIES.

Experiences in other parts of the world have shown that auxiliary industries develop in the periphery areas of the steel towns to take advantage of steel products,

skilled labour and ready market created by steel workers. A list of possible industries that readily came to mind is given below.

a. Corrugated iron sheet manufacturing
b. Car and metal box Manufacturing
c. Marine Engineering industry
d. Tubes, pipes and fitting industry.
e. Spare parts industry
f. Rolling mills for reinforced bars
g. Bolt and Nuts Industry
h. Cement Factory
i. Hand tools manufacturing
j. Motor building industry
k. Cuttlery and house hold utensils manufacturing
l. Wire manufacturing
m. Agricultural machinery.

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CHAPTER SIX

SUMMARY OF FINDINGS, POLICIES, RECOMMENDATIONS AND PROPOSALS

6.1 SUMMARY OF FINDINGS.

6.11 The region is sparsely populated due to out-migration of virile population. The outmigration is a reflection of low productivity from agriculture which invariably lead to poor financial returns. With the establishment of iron and Steel Complex - out-migration will be checked and there will be net in-migration. About 153,000 people are expected during the construction stage alone. Tables 4.1, 4.2, 4.3 and 4.4 show the expected in-migration at different stages of production.

The establishment of iron and steel complex will result in displacement of some settlements as shown in figure 5.3. Most of them will be displaced either to create buffer zone between residential and industrial activities or due to construction of new roads and bridge across the Niger. The displaced settlements need to be relocated.

The expected large influx of people and their associated activities will generate a high demand for transport facilities, as shown in schematic diagram in

figure 5.5, which the existing network can not cope with. All various types of raw materials needs to be transpated to the site from their various sources.

Another major impact of the propsed iron and steel complex is environmental degeneration around the complex.

These pollutants result from various processesof steel making as analysed in section 5.5. The major types of pollution are air pollution resulting from dust, smoke and other percolate matters; water pollution; destruction from old quarries and mining pits.

All the new towns and settlements will require facilities and services like electricity, pipe borne water, health facilities and sewarage disposals which were hitherto lacking or grossly in-adequate in the region.

6.2 BROAD POLICY DECISIONS BASED ON FINDINGS AND OBJECTIVES

6.21 (a) The policy of location of settlements with development will be followed to achieve regional development within the area under study.

(b) The location of settlements will be used as a means of integrating the local inhabitants with the in-migrants.

(c) The settlements will be located in such a way as to attract auxilliary industries and other over-spills from the steel complex. Most of the workers in these settlements will be working in the steel mill and thus, the new settlements will act as satellite towns to the Steel City.

(d) The inhabitants of both the new and old settlements will be protected from pollution and heavy traffic through a delibrate policy of their location.

(e) The relocation of displaced settlements will be considered as part of the implementation of the 3rd National Development Plans, Policy on Rural Development.

6.22 The policy for location of transportation networks are

(a) To facilitate the efficient movement of people and goods in response to demand as shown in figure 5.5

(b) To open up new areas that were hitherto inaccessible.

(c) To link the potential Urban Centres and to improve the existing accessibility to various settlements by a net work of roads.

(d) To improve road safety.

6.23 The policy for environment is to minimize the effect of identified pollutants on residential and commercial activities, as well as to protect the quality of the rivers, farm lands and forest reserves.

6.3 R E C O M E N D A T I O N S.

(a) The N.S.D.A., in conjuction with stated ministry of agriculture, should acquire and develop large tracts of land around the new settlements for onward transfer to farmers that would be re-located.

(b) Services and facilities like pipe borne water and electricity should be provided to attract auxilliary industries and steel workers in the new settlements.

(c) No residential or commercial development should be allowed within two kilometers of the highways to guarantee safety of the people.

(d) The Central Water Transportation Company should be re-organised to provide efficient water transport for both raw materials and steel products.

(e) There is the need for the construction of an aerodrome, since the closest airport (at ILORIN) is

about 250 km away. It will be used to transport personnel and spare parts as may be required by the Steel works.

(f) The used water should be treated before it is discharged into the river. Most settlements along the river Niger depend on river water for their domestic uses.

About 600 million kwh of electricity is required in the steel city alone assuming an average of 60,000 kwh per worker per annum. The National Electric Grid Line should be extended from Okene to Ajaokuta and other proposed settlements. The proposed dam should be planned with the objective of supplying the steel works and all other neighbouring centres.

6.4 P R O P O S A L S

6.41 All the new settlements have been located outside a radius of Ten kilometers from the steel plant. This zone has been left as buffer zone to accommodate future expansion of the steel complex and other ~~noruous~~ noxious auxilliary industries.

As much as possible all the new settlements have been located close to the highways and other major roads to facilitate movement of goods workers.

RIVER BENUE

LOKOJA

SARA

KPOROKPO

AJAOKUTA

OKENE COMPLEX

EBIYA

STEEL PLANT SITE

GANAJA

ITOBE

ADUMU

ARABA

AYANGBA

DEKINA

UNOMI

OFOKAFI

GWOLAWA

TERUMBIA

RIVER NIGER

250

500

750

1000

1250

LEGEND

NEW SETTLEMENT

500,000

250,000

100,000

50,000

10,000

Figure 6.1 shows the proposed pattern of settlements in the region by year 2000

Table VI - 1 gives the pattern of Urban land use in some existing and proposed settlements as a guide towards the year 2000. The table also suggest the proposed population and function of the various settlements.

TABLE VI - 1 - PROGRAMME OF LAND USE DEVELOPMENT IN SOME SETTLEMENTS BY YEAR 2000.

TOWN/VILLAGE	SIZE	FUNCTION	AREA IN HECTARES	DISTRIBUTION OF LAND USES IN HECTRES.						
				RESD.	COMM.	IND.	PUBLIC	OPEN SPACE	ROAD	OTHERS
Okene	700,000	Multi purpose	8750	4463	263	613	1225	613	1050	525
Lokoja	150,000	Commercial	1875	975	94	150	118	75	281	113
Ajaokuta	265,000	New Industrial	3313	1590	99	398	331	298	398	199
Ebiya	62,000	"	775	364	23	77.5	93	77.5	77.5	62
Kpor-okpo	90,000	"	1112	540	34	135	112.5	112.5	112.5	79
Itobe	49,000	Transport	613	331	25	43	80	18	86	31

88
90

RIVER BENUE

LOKOJA

OSARA

aerodrome

KPOROKPO

ERO

DAM

GEREGU

TERUMENA

STEEL PLANT SITE

EBIYA

GANAJA

DOGOPAJI

AJAOKUTA

ITOBE

ADUMU

DEKINA

AYANGBA

ARABA

UNOMI

OFOKAFI

GWOLAWA

RIVER NIGER

250
500
750
1000
1250

from oturkpo (200km)

LEGEND

Federal Roads

" " (Proposed)

State Roads

" " (Proposed)

Railway Line (Proposed)

6.42. About 3 million tons of iron ore is required annually by the Steel plant from Itakpe hills. To facilitate the transportation of the Ore and to reduce traffic on the highway, it is proposed that the Oturkpo - Ajaokuta railway line be extended to Okene as shown in ~~fig~~ fig. 6.2

A road link between Lokoja and Ajaokuta along the Niger has been provided to transport limestone from Jakura Plateau (35 km north of Lokoja) and also to link the proposed federal capital territory. fig. 6.2.

Another road link has been provided between Itobe and Idah (see fig. 6.2) along the Niger valley. This road will cater for goods and people from eastern states and also remove the cost of constructing another bridge at Idah, had it been it is located on the other side of the river Niger.

The Federal Government has approved the construction of a four lane road to link Okene and Ajaokuta. Work has already started on the road construction. The Nigerian Railway Corporation has also completed feasibility studies of a railway line between Oturkpo in Benue State and Ajaokuta over a distance of about 200 km.

There are several conceptual urban forms which could be applied to expansion of Ajaokuta steel city. The findings after a series of proposals and weighting of the objectives, was to develope a series of small satellite towns around Ajaokuta to take care of overspills from steel city. This is shown in figure 6.2.

It is hoped that if the above recommendations and proposals are given due consideration, the problem of a region that had hitherto been characterised by poverty, out-migration of virile population and low education rate would have been solved.

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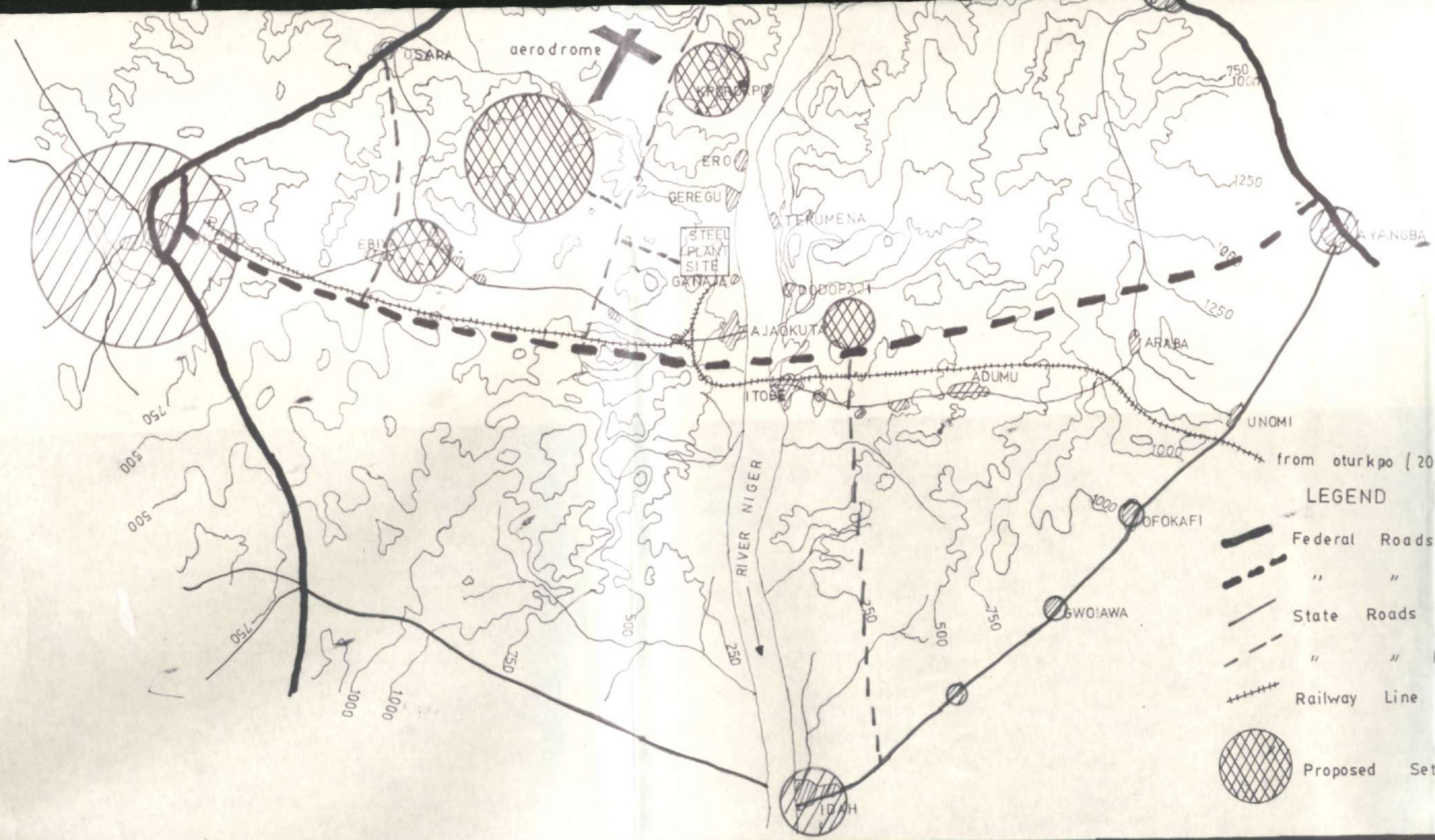
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AJAOKUTA IRON AND STEEL PROJECT.

PROPOSED TRANSPORTATION NETWORKS AND SETTLEMENT PATTERNS

0 4 8 12 16 20 KM

1600 HECT.

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