A STUDY OF HOUSING PROBLEMS OF KHARTOUM NORTH DIEMS.

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June, 1982.
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ACKNOWLEDGEMENTS.

I wish to express my acknowledgement to Dr. Fatima Habiker, for the patient supervision and the co-operation in testing my crude ideas. I would like to acknowledge Professor Ian Haywood for supervision and co-ordination of the course. Many thanks are due to all who encouraged, supported and provided me with information.
The Democratic Republic of the Sudan lies in the North East of Africa between the tropics of cancer in the North and the Equator in the South. Sudan is the largest country in Africa occupying 2.5 million square kilometers. The country is bounded by several countries, Egypt and Libya in the North and Central Republic of Africa and Chad in the West, Zaire, Uganda and Kenya in the South, and Ethiopia in the East (See Fig. 1).

According to the 1973 National Census, the population of the country reached about 14,171,700 persons. The annual average rate of increase is about 1.8%. So according to the average rate of increase the population will be 16,212,425 persons in the year of 1981.1/

Khartoum is the national capital of the country. It is located at the junction of the two Niles (The Blue and the White Niles) actually the capital city is composed of three towns, Khartoum, Khartoum North and Omdurman. These three towns are separated by the two Niles (See Fig. 3, the location map).

FIG. 4.
SUDAN
LOCATION OF THE THREE TOWNS
This paper is concerned with the discussion of the housing problems in Khartoum North Diems. Its primary objective is to explain the problem, discuss it and analytically provide a diagnosis for it and suggest certain steps to be adopted towards its solution.

Before considering the main characteristics of Khartoum North Diems, it may be useful to identify the main factors that have attracted settlements to this point. One of the major reasons of immigration to Khartoum North is the establishment of Khartoum North Industrial area which attracted both the skilled and unskilled workers from cities and rural areas. A secondary factor is the establishment of the River Transport Dock in Khartoum North. This has also attracted people to the town.

The main characteristic of Khartoum North Diems are that these Diems are located in a unique situation adjacent to the town centre. Due to this significant location the commercial activities have expanded in a ribbon pattern following the major roads. These Diems are suffering many problems. The high increase of population has created a problem of housing and bad environmental condition as well as the problem of landownership.
Those problems need urgent solutions and actions, since they have created serious consequences on the general environmental condition and human life at large. A primary objectives should be put for the development of this area as follows:

1. To examine and evaluate the existing land resources to be exploited in rational manner for the benefit of the people.
2. To improve the general environmental condition.
3. To provide the area with adequate services.

This paper consists of six chapters, each chapter is concerned with the discussion and analysis of a certain statement of the study.

The first chapter is introduced with the discussion of the historical development of Khartoum and how the initial emergence of Khartoum North Diems was affected by the historical evolution of Khartoum. It gives a brief account of the geographical location of the Diems and the direct relationships between this location with the surrounding area.

The second chapter deals with the current situation of the area with emphasis on the existing socio-economic
and environmental condition covering the housing require-
ments, population growth and physical environment.

The third chapter is concentrated on discussing, analysing and diagnosing the major problems of the area, taking into account the major reasons behind the creat-
on of these problems.

Chapter four discusses housing strategy in the world with special reference to the housing situation in the Sudan. It gives a broad lines of housing strategy, housing standards and the main characteristics of housing projects. The emphasis is on the upgrading and rehousing programmes and how these schemes are to be executed.

Chapter five mainly concentrates on certain specific objectives aiming for the development and promotion of the existing situation of the area. Planning standards have been developed related to the needs of the area, as well as proposals have been designed within the objec-
tives framework, and have been examined and evaluated to achieve these objectives.

Chapter six is concerned with the discussion of the stage of implementation. Through this chapter a criteria has been put to distinguish the population of the area and
to identify priorities of housing occupation. Also an upgrading scheme is recommended to be adopted for Khartoum North District. The population of the area will be divided into two parts. The first part will be accommodated in the old site and the remaining people are recommended to be evacuated to a new site and services scheme. Added to this the financial sources have been put for the execution of the upgrading scheme, and a body of control has been formed to co-ordinate the operations of implementation as well as a committee is recommended to be established to follow up, supervise, and submit reports about the proceeding of the scheme.

The method adopted for data collection included initial site visits to make general observations and to identify the general characteristics of the area.

A certain technique has been followed for data collection. As an initial step a questionnaire has been designed to carry a sample survey. The sample survey that made for this, a study was covered 5.5% from the total population live in the area. The main purpose of this sample survey is to examine and to investigate the current situation of the area. The questionnaires forms have been filled by interviewers.
who interviewed a certain specific sub-area, then the
data has been classified and sorted-out and the survey
findings have indicated the required information about
the current situation. The survey findings have been
presented in a form of tables, diagrams and different
maps.

Several ministries and institutions involved were
consulted and investigated about the various policies
and actions being approached for the specific case. Such
institutions as Department of Housing, Department of
Town Planning, Khartoum Municipality, and the People's
Local Council of Khartoum North Diema. Some individuals
were interviewed to approach the public opinion. The
findings of these interviews provided data upon which the
explanation of the problem was based and an account of
the stages through which the area historically evolved
given.
CHAPTER ONE

THE LOCATION AND THE HISTORY OF THE AREA

1. The Historical Development:

The historical development of Khartoum North District was obviously affected by the forces that shaped the development of Khartoum. Therefore, in order to speak about the history of Khartoum North District, it is necessary to identify how Khartoum came into existence and how it was developed.

During the 16th century a.D., a permanent settlement was occupied by the Mehas tribe emerged in Tuti Island at that time.1

About 1691 a religious man from Mehas tribe called El Shiekh Arab El Agaib built a permanent house in Khartoum, and started teaching the people the principles of Islam. A large number of people from Mehas and other tribes were attracted and clustered around him and formed a settlement. This is how the village of Khartoum came to existence.2

At about the same time it is recorded that the village of Khogali and Hamad were built in Khartoum North. Perhaps the people who lived in Tutu Island were diffused to Khartoum and Khartoum North searching for more fertile agricultural land for cultivation. It seems that Omdurman was built at a later date.

In 1909 the Blue Nile bridge was established, and the railway line reached Khartoum. This fact increased functions of Khartoum town and gave a considerable significance to Khartoum North. Omdurman continued to attract population because it was a native town.1/ (See Fig. 2).

Khartoum North is located on the north bank of the Blue Nile, it is connected with Khartoum by road and rail over the Blue Nile bridge. The villages of Khogali and Hamad and Sababi were the origin of settlements in Khartoum North. They were established about 270 years ago and their total population was about 500 people. These villages did not have a definite plan. Their roads were run accordingly to the houses layout.

As my empirical research findings suggest, due to the transformation of river transport headquarters from Wadi Halfa to Khartoum North, many departments had been

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FIG. 2
STAGE IN THE GROWTH OF
THE THREE TOWNS:

KEY

PRE 1915
1915 - 1935
1935 - 1970

SOURCE: ELSAYED EL BUSHRA
"ATLAS CONURBATION OF KHARTOUM" 1976.
established, as Department of Mechanical Transport and the Ware Houses Departments etc.

This establishment of different departments attracted people to Khartoum North town searching for work. Housing was considered of a great importance to accommodate people who worked in the river transport and other departments. Therefore, several residential areas were built, such as Millat Al-Widr, Millat El-Waharat. These were particularly built for the river transport workers. The construction of Kobar prison during the condominium period had led to the emergence of Millat Kobar. This was specially built for the prison workers.

The provincial authorities had built residential areas, but they were not sufficient to accommodate the increasing number of people who migrated into the town seeking work in the different departments. The growth of the town centre had attracted the in-migrants to work as porters and other manual activities, consequently the need for housing was of great importance. Because of the acute housing shortage, people were driven to erect squatter settlements.

The squatter settlements existed north of the American Mission school at early 19th century. Due to
the overcrowding and bad environmental condition, the provincial authorities decided to remove them further north to the area which is recently occupied by the police dwellings.

In 1929 Khartoum North Diasa came into existence as a result of rapid movement of people from the rural areas to the capital of the Sudan. This was coupled by the increase of population in the three towns.

The squatters built their dwellings from the available local materials such as thatch, tins and cardboard. The poor organization of the settlement created bad environmental conditions. This invited the provincial authorities to intervene to solve the problem by introducing upgrading programmes for the squatter settlements which were removed further north and had been given the required land. Each family was given a plot ranging between 180 to 200 sq.m. The settlement was considered as a fourth class area (native lodging).

Khartoum North Diasa were dominated by brewery houses producing and selling local brew. According to this the authorities had added brewery shops, which created some troubles for the adjoining residential areas. This invited the provincial authorities to remove these
2. The Geographical Location:

Khartoum North Districts comprise two parts. The eastern part, and the western part. The area is surrounded by other residential areas. To the north it is bounded by El-Manad and El-Shaab schools. South of the area lies El-Khatmien, El-Damagla South and the police dwellings. To the east the area is bounded by El-Khatmien and to the west it is restricted by El-Damagla north and South (See Location Map).

3. The Surrounding Area:

The entire Khartoum Province has been classified to different functional and interacting zones. Due to the social, economic and environmental interaction different interrelationships were created.

The population increase in the three towns is accounted for through both the natural increase and internal migration, but the later is the major determinant. For the past one and half centuries migration

of rural people into Khartoum area has been continuous. The excessive migration has led to the creation of squatter settlements. This is primarily because the housing provision is not sufficient, proportional to the number of people who move to Khartoum Province.

In fact the main reason behind the rural-urban migration in Khartoum is the opportunity of work. Different functional zones have emerged: residential, industrial, commercial as well as administrative and other functional zones. The whole Khartoum Province is interlinked by efficient means of transport which facilitate the movement of people over the various functional zones, stimulating and creating different interrelationship in all aspects of human life.

One of the major reasons for migration to Khartoum North is the establishment of Khartoum North Industrial area. The industry attracted both skilled and unskilled workers from cities and rural areas. This is one of the major reasons behind the emergence of squatter settlements in Khartoum North, and the overcrowdedness of Khartoum North Dimsa. The industrial area also affects the Dimsa surrounding by allowing expansion of squatter settlements around the Dimsa, (See Location Map).
CHAPTER TWO
PRESENT SITUATION

This chapter will mainly deal with the current situation in Khartoum North Diema. Its aim is to reveal the dimensions of the problems of the Diema plus its people. This covers all aspects with special concentration on the population and housing conditions. The material and data on which analysis are based is an outcome of empirical research that was carried out in the Diema. The research included standardized interviews in a questionnaire form, interviews with officials and with notable figures and elderly people of the Diema.

Section (A):

Land Ownership:

Land ownership in the Sudan runs into two types, freehold and leasehold.

The freehold is mainly owned by the individuals. The leasehold is the government land which is owned by the Sudan government.

In Khartoum Province most of land is of leasehold system. It is owned by the government except some fragments are privately owned (See Figure 4, Land Ownership).
Khartoum North Dimsa came into existence to solve the need of squatters in Khartoum North. These Dimsa were removed two times from their original site. The inhabitants did not violate nor did they speculate in land. The land was given to them according to a rehousing programme which was adopted by the provincial authorities. They were rehoused but were not given any documents or initial contract except a certificate of research identifying the property ownership. According to the land regulations the provincial authorities consider Khartoum North Dimsa as fourth class (Native lodgings area).

Section (p) - Population:

1. Population Growth:

The population in Khartoum province grew rapidly during the last two decades. The National Census of 1955/56 revealed that the population of the three towns reached 201,811 persons and in Khartoum North it reached 40,187 persons.

According to the National Census of 1973 the population of Khartoum province reached 784,924 persons. The annual rate of increase is 5%. The population of
Khartoum North reached 150,989. Therefore according to the annual rate of increase, in 1981 the population of Khartoum province is expected to have reached 1,188,006 persons and in Khartoum North it is estimated to have reached 454,601 persons.

In 1981 the people's council carried out a survey of Khartoum North Daires. The survey indicated that the total population of the area is 13,750 persons. Comparing population of Khartoum North Daires with the population of Khartoum North, this will constitute about 3% of the total population of the town.

Khartoum North Daires is characterized by a high density of population compared with other residential zones in Khartoum North. The average density per plot is 10 persons. This high density has created many problems in the area.

2. Sex Composition:

The sample survey which indicated that 56% of the total population are male and 42% are female. (See Diagram 1 and 2).

As a matter of fact 27.2% of the total population are married and those who are unmarried constitute 62% of the total population (See Diag. 2).
3. Age Composition:

The population pyramid indicated that those at the age of primary school represent 27.7%. Those at the age of general and high education represent 29% of the total population. Those at the age above 25 and less than 45 years constitute 33.7% and those who are over 50 years represent 10% of the total population (See Diag. 3).

4. Social Relationships:

The population of Khartoum North District is composed of several Sudanese tribes as well as some foreigners from the neighbouring countries. Most of Khartoum North District population is formed of the northern provinces, and the western provinces. The remainder are from other provinces (See Diag. 4).

Forty seven per cent of the total population of Khartoum North District is coming from the rural areas. Those born in towns constitute 49% of the total population. There are few foreigners migrated from the neighbouring countries particularly the Ethiopian people (See Diag. 5).

No social interrelationships have been found among the inhabitants. Furthermore there has been no relationships created with other neighbourhoods.
Diag. 3
Age and Sex Composition of the Diems Inhabitants
Diagram 4:
Percentages of different tribes in the DIEMS
DIAG. 7

PERCENTAGE OF BUILDING AND ROOFING MATERIALS
The area is characterized by some houses which are practicing prostitution and others producing and selling local brewery. These phenomena are particularly practised by Ethiopian and some western Sudanese tribes.

5. Employment:

The inhabitants preferred to settle in Khartoum North Diems because it is not far from Khartoum North industrial area. The industrial area is located about one mile from the area. Most of the inhabitants are working in the industrial area as labourers. The per capita income is low. It constitutes 80.6% of the working force of the area. The remainder of working population are engaged in business work and a few are employees in different sectors.

Section (c): Housing:

1. General Housing Condition:

Khartoum North Diems has been classified as fourth class as mentioned above. In general the housing condition is poor. The poverty of the inhabitants is reflected in the bad condition of housing. The total number of plots is 1,200 allocated in an area of about 58 hectares. The
orientation of the area is east west. The layout of plots is back to back. The plot size is ranging between 100 to 200 sq./m. In general the streets are wide (See Survey Map).

2. Building Materials:

According to sample survey findings, most of houses in Khartoum North District built of Jalka (m). These constitute 73.2%. Houses which are built of gishra (xx) represent 16.3%. The few houses built of red brick constitute about 9.8% (See Diag. 6).

In general houses roofed with Falad (xxx) represents 53.7%. The roof consists of Rasas (xxxx) covered by Zibala (xxxx) and supported by Mirig (xxxx). The houses which are roofed by timber and corrugated sheets represent about 46.3% of the total houses (See Diag. 7).

(m) Jalka: Local name for wall built of mud.
(xx) Gishra: Local name for wall built of brick and mud.
(xxx) Falad: Local name for roof of local materials.
(xxxxx) Rasas: Local name for wooden secondary beam.
(xxxxx) Zibala: Local name for animal waste used as roof plaster.
(xxxxxx) Mirig: A log supporting Rasas.
Windows and doors are made from iron sheets and timber. Mainly the plot has one external door with a narrow corridor leading to the house.

In general, houses in Khartoum North Diams lack sanitary services, particularly, kitchens and bathrooms. The pit latrine (well) is quite common in the area. These services are unevenly distributed and not consistent with the layout of the plot (See Table 1).

<table>
<thead>
<tr>
<th>Type</th>
<th>Private</th>
<th>Shared</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen</td>
<td>24.1%</td>
<td>15.6%</td>
<td>60.3%</td>
</tr>
<tr>
<td>Bathroom</td>
<td>20%</td>
<td>16%</td>
<td>64%</td>
</tr>
<tr>
<td>Latrine</td>
<td>26%</td>
<td>50%</td>
<td>22%</td>
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As mentioned above the average density is 10 persons per plot. The rented houses constitute about 78.6%. Houses occupied by the owners represent about 21.5%. Houses which occupied by more than one household constitute about 74.5% of total houses number in the area (See Diag. 6 and 8).
Section (D): Facility and Utility Services:

(a) Social Services:

1. Education:

The educational services in the area consist of three primary schools. One for boys and two for girls. The illiteracy in the area is about 32.7%. The primary school age constitutes about 31.3% of the total population. General secondary school age represents about 15.8%. 8.8% constitutes the pre-school age (See Table 2 and Survey Map).

Table 2:
The Level of Literacy in the Area:

<table>
<thead>
<tr>
<th>Illiteracy</th>
<th>Primary</th>
<th>General</th>
<th>High</th>
<th>Pre</th>
<th>Kindergarten</th>
<th>Sec</th>
<th>Sec</th>
<th>School</th>
<th>Garish</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.7%</td>
<td>31.3%</td>
<td>15.8%</td>
<td>6.4%</td>
<td>8.8%</td>
<td>3.3%</td>
<td>1.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Health Services:

Generally the area lacks health services. People go to Khartoum health centre to satisfy the medical care. This health centre is located at about five kilometers from furthest household. Added to this the inhabitants satisfy their health needs in Khartoum North public hospital which is located not further from the area (See Survey Map).
A public hospital under construction specializing in children medical care is located adjacent to the area.

3. The Market Area:

The market area is composed of several *Kitake*. These *Kitake* are specialized in selling different commodities. The market area by its various commodities attracts people from different parts of Khartoum region. It has a big catchment area which covers a wide range of Khartoum province.

The market area consists of two parts. The western part is mainly characterized by several *Kitake* selling different commodities, such as cloth, perfumes, shoes and other commodities. Furthermore, there are barbers, tailors, gold makers as well as craftsmen. These activities are intermingled within other shops.² (See Survey map).

The other part of the market is mainly characterized by *Kitake* selling food and soft drinks. These different specialized *Kitake* are owned by merchants, from the area and other adjoining areas.

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*(m)* *Kitake*: Small scale shop built of timber or iron sheets.

(1) Nowadays a dismantling process is carried by the provincial authority for this market. The aim is to rebuild it by fire bricks.
Khartoum North Diems are characterized by several corner-shops which are distributed over the area providing the inhabitants daily needs. (See Survey Map).

4. Other Social Services:

The area has a police station which occupies a house located in the market area. This unit consists of the three policemen. This police unit has to keep security in the market area, the neighbourhoods as well as Khartoum North Diems.

A mosque is found in the area, but it is too small not satisfying the Muslim religious needs. According to my personal observation, this mosque is not quite sufficient to accommodate the prayers.

A house of handicapped people is found in the area. It was established since 1989, when the squatters had been rehoused. This house is mainly built for the people who will not be able to build their houses and particularly for the handicapped people. It is a governmental establishment managed by the Ministry of Social Affairs (See Survey Map).
There are three social clubs serving the whole area. Two of them are privately owned, representing some of the Sudanese tribes in the area. There is one known which is located near the mosque. This has no function, it is occupied by a family.

A playing field which lies at the southern side of the area, serves the whole area of Khartoum North. It is called Agreab square. It is a famous square, it has been attracting people from all parts of the town to watch the football matches. These football matches will be held three times per week. In the morning this field is used as a fodder market. Furthermore the eastern side of the square is occupied by Kiosks selling food and soft drinks. Also it is occupied by shoe-makers and other craftsmen. (See Survey Map).

(b) Utility Services:

1. Water, Electricity and Drainage Provision

The whole area is provided by water supply. Each plot has been supplied by water services. Houses which are provided by water represent 92.8%, and houses which are

(a) Zowia: Local name for small scale mosque.

(b) Agreab: Local Arabic name for Scorpion.
nt served by water supply constitute about 71.6%. There are no outdoor water points to serve houses which are not connected by water (See Diagram 10).

The electricity provision is quite common in Khartoum North District. Houses connected to electricity constitute about 71.6%, and houses which have no electricity service represent about 28.4% of the total houses in the area (See Diagram 10).

A drainage main has been passed through the area. This drainage main is mainly constructed to serve Khartoum North industrial area. The area lacks permanent drainage system. It has a seasonal drainage which usually maintained in summer and completely buried up during other seasons by the People's rubbish which is thrown into the drainage main (See Survey Map).

2. Rubbish Collection:

Generally the area is polluted by rubbish thrown into the streets. The points for rubbish collection are inadequate and not distributed evenly. Furthermore the inhabitants are keeping their animals either inside their houses or built Zariba (x) in

(x) Zariba: Local name for animal shed.
the street for animals. This has created bad environmental conditions.

3. Transportation Means:

Khartoum North Diems are located on two major roads (Shari El-Dawhi and El-Busta). These two main roads are serving most of the Khartoum North residential area. Shari El-Dawhi is considered as one of the major inter-regional roads in Khartoum Province. This road is serving Khartoum North periphery. It is an asphalted road.

The means of transport are composed of public buses, and taxis. Most of the inhabitants in Khartoum North Diems use public transport.

Section (c): Current Concepts of the Involved Sectors:

In terms of planning, Khartoum North Diems have been neglected for a long time. It has never seen any improvements or attempts to solve its problems whether by the inhabitants or municipal authorities, taking into account that all the neighbourhoods were replanned.
Since 1970 the inhabitants felt that planning is of great importance for the enhancement of the area. They have been requesting the provincial authorities to pay attention to their area. People through their representative members of the People's Council raised application to the authorities presented the problems facing the area.

In the early seventieth the provincial authorities respond to them. The authority proposed that this area should be upgraded to third class and the plot adjacent to main roads should be upgraded to second class and the inhabitants must pay the land and services cost plus the premium reserve fund. The inhabitants were opposed to this proposal for some reasons including the following:

1. The inhabitants could not afford to pay the cost of land, basic services and premium reserve fund.
2. In the case of upgrading the plots adjacent to main road to second class, the inhabitants could not afford to build to second class standards.

In 1975 the commissioner of Khartoum Province visited the area of Khartoum North Diema. He was met by the people in general assembly. The inhabitants through their member of people's council presented their
problems. The commissioner was convinced by their issues. He decided that the area must be upgraded to third class. He recommended that:

1. The whole area should be upgraded to third class without added improvements.
2. The building which are qualified for the required standard of third class should be registered and given leases according to the land law of 1947.
3. The cost of land, basic services, and premium reserve fund should be paid.
4. In the case where building standards are not meeting the provincial authorities requirements, the owner will be given an initial contract of one year to improve his house, otherwise it will be confiscated by the government.
5. Those who cannot afford to improve their houses according to the required standard of the third class area, will be compensated in any native lodging area in Khartoum Province.

The commissioner of Khartoum Province recommended that the decision of upgrading the area to third class be implemented urgently. Therefore the provincial
authorities prepared to implement the commissioner's recommendations. The work started and 25 persons had been given the lease. Before the completing of the work the authorities has discovered that the work is not proceeding legally and it must be stopped.

The inhabitants through their representative members of the People's Council, and through their political, social and other establishments, followed up the decision to solve the problems faced by the implementation of this decision.

In 1979 the provincial authority decided to remove the local market from the area. This market was decided to be located in El-Haj Yusuf at the eastern part of Khartoum North. The site plan was prepared and approved by the concerned authorities and it is waiting for the implementation.
CHAPTER THREE

GENERAL ANALYSIS AND PROBLEMS.

The objective of this chapter is to analyse the current situation of Khartoum North Diems. I will thus attempt to diagnose and examine the problems facing the area and to find out to what extent these problems affect the area.

In the light of the survey findings which have been presented in the previous chapter, it has been suggested that Khartoum North Diems existed to accommodate the squatter settlements which emerged in the heart of Khartoum North town and played a negative role on the general environment.

Khartoum North Diems is a significant site. The Diems are located in a central site i.e. adjacent to the city centre, taking into account that the city centre has a high land value. The land of Khartoum North Diems is valuable because it is very attached to the town centre. This valuable land encouraged land speculators. In other words the land speculator will investigate this land to
achieve more revenue, they concentrate their pressure on the provincial authorities to remove the inhabitants and they are ready to purchase the land.

The inhabitants were legally rehoused in this area. Accordingly they are aware of their relationship to the land they are occupying, because they are bearing in mind that:

1. Land is a national right for every Sudanese.
2. Land speculators has a direct pressure on the authorities to remove Khartoum North Diams. So the inhabitants are expecting to be removed. They have no desire to improve their dwellings.

It has been indicated that a high influx of in-migration from the rural area to the urban centres, particularly to the three towns, according to the National Census of 1973, that the movement of people from the rural area to the towns, is very high. The National Census indicated that the high increase of population is due to the rural-urban migration rather than natural increase. The annual rate of increase of population is 5 per cent for the province of Khartoum. So the population has been accounted according to this
rate of increase. The population in Khartoum Province exceeds one million.

This high increase of population has created various problems in Khartoum Province. The effects of this increase will cover all the urban aspects creating many problems affecting the human life.

Khartoum North Diams as one of Khartoum's residential areas interacts with the other Khartoum functional areas. These Diams are directly affected by the high influx of immigration to Khartoum Province, taking into account that these Diams are located close to Khartoum North Industrial area. The nearest location of these Diams to the industrial area and the town center encourage the in-migrants to settle in the Diams in order to be as near as possible to their place of work.

In 1981 the population of Khartoum North Diams reached about 13,750 persons. This reveals that the population is increasing rapidly. The sample survey which has been carried out for the area indicated that the number of males is more than the females (See Diag. 1). This shows the obvious movement of people from the rural area and other towns to the Province of Khartoum. The males constitute
58 per cent of the total population in the area and the female represent 42 per cent. Also the unmarried people constitute about 63 per cent of the population. The married people represent about 22.2 per cent of the total population. This fact has confirmed that a high numbers of in-migrants moved to Khartoum Province, particularly to Khartoum North Diems. These Diems received a high numbers of in-migrants during the late 70's. The average plot density reached 10 persons, taking into account that the size of plot ranged between 180 to 200 sq.m. This emphasized that there is over-crowding in this area.

One of the major problems which characterizes Khartoum North Diems is that, these Diems have no interrelationships with the neighbourhood. This area does not interact with the surrounding area in terms of social relationships. The area is inhabited by people representing different Sudanese tribes as well as foreigners particularly from Ethiopia. The people of different tribes are not able to create social relations either between them nor with other neighbourhoods. (See Diag. 4).
Another social problem which characterizes the area is that, this area is dominated by prostitutes and houses producing and selling local brewery (Karesa). These two social phenomena have attracted people from all parts of Khartoum Province and created a very big catchment area. Due to the availability of these phenomena, the environmental conditions deteriorated. Moreover drunkards, stealing and other crimes occurred.

The inhabitants of the neighbourhoods view Khartoum North Diems as an area of minority groups. Moreover, the existence of prostitution and brewery selling activities creates a real obstacle to possible relationships between Khartoum North residents and Khartoum North Diems inhabitants.

The area is inhabited by low income groups. The majority of them are wage labourers engaged in the industrial area. In general the wages are low. The poor housing condition indicated that the per capita income is limited which is not satisfied the subsistence of the household. The labour of the low wage constitute about 80.6 per cent of the total labour force in the area.
Housing in the area is generally poor. The plot layout has no proper design. The size of plot is ranging between 180 to 200 sq.m., which is not sufficient to accommodate more than one household. The land resources available is not rationally utilized. The average density per plot is 4 rooms beside the sanitary services, such as kitchen, latrine and bath-room which are not evenly distributed in the house (See Table 1).

The area lacks adequate educational services, except for three primary schools which is not sufficient to accommodate the school age group in the area, taking into account that children from the surrounding residential areas have been accepted in these primary schools. The area lacks general and high secondary schools as well as kindergartens. The pupils are sent to the schools of the neighbourhoods particularly El-Khatmia as well as El-Shaab schools (See Survey Map and Table 2).

The survey findings indicated that a minority of those at school age have access to educational chances even at the elementary level.

There are no health services in the area. El-Khatmia the nearest health centre provides the area with medical
care. At the time the research was undertaken, El-Khatmia Health Centre was found to be overloaded because it is serving all the surrounding areas including Khartoum North Diem. Furthermore, the inhabitants go to Khartoum North general hospital, which is also overloaded because it serves the whole province as well as rural patients (See Survey Map and Dia, 9).

The area has a mosque which is not adequate to satisfy the inhabitants' religious needs. Also there is one zawia which is functionless, because it is occupied by a family.

A market area has been founded. It is a local market which has a very big catchment area. This market is serving all Khartoum Province and it has created congestion and over-crowding in the area as well as polluting the general environmental condition because large amounts of dust in the area.

The area has only three social clubs. These clubs are not adequate to stimulate social activities in the area, because there are different tribes.
Living in this area as well as a large population of 13,750 persons.

There are only five open spaces in the area which are not sufficient. Open spaces are very important in such an area because they will become a breathing organ for the residential areas. Moreover they will encourage children to play and to recreate. Furthermore the area lacks a local centre which is very important for stimulating the social interaction between the inhabitants and could be used as a place for recreational activities.

The expansion of the city centre northward has been considered as one of the major problems facing Khartoum. There is excessive movement of commercial activities following the main roads in a ribbon pattern particularly (El-Dawahi Road). This expansion will reach the area in the future and will create problems because it will create a mixed area of commercial and residential uses.

The inhabitants should be prohibited from throwing their rubbish in the streets, by creating a rubbish containers and must be distributed regularly over the area. Furthermore, due to the throwing of rubbish in
the streets, the drainage system has been buried. It is my contention that locating rubbish containers in a fixed points will encourage people to collect their rubbish easily. This will eliminate the environmental deterioration.

Khartoum North Diwals are located on two major transport routes (Shari El-Dawahi and El-Basta). The inhabitants are suffering from acute shortage in the means of transport. This is simply because the area has no terminal point for transport. People waste a lot of their time waiting for transport.

The inhabitants accepted the suggestion which was introduced by the provincial authorities. To upgrade the area to a third class area without adding any improvements. According to my own judgement this proposal was put in a hurry because it is obvious that the provincial authorities are aware of the problems facing the area under consideration. The implementation of this proposal might create or perhaps add another host of problems.

Generally Khartoum North Diwals are characterized by these major problems.
1. The inhabitants did not have documents to identify their merit of owning the land except certificate of research.

2. The area has been occupied by a high density of population. The average density per plot is 10 persons occupied a plot is found to be ranging between 180-200 sq.m.

3. The area lacks adequate social establishments such as social clubs and youth centres.

4. The area lacks open spaces.

5. The educational in the area are not sufficient.

6. The area lacks health services.

7. The area also suffers from the problem of inefficiency of drainage system and the throwing of rubbish in the streets.

8. The expansion of the city centre northward will create a variety of problems in the future.

9. The area lacks social interaction with the neighbourhood.

10. The area is dominated by prostitution and house/brewery activities which caused various crimes.
Transport is inefficient because one have to take into consideration the fact that the area is located between two major transport routes.

In general, Khartoum North Diems are characterized by various problems, such as high density of population, poor standard of housing as well as the deterioration of the general environment. In addition, this area lacks adequate services particularly in terms of facilities. These problems have played a negative role on human and have retarded the development of the area.
CHAPTER FOUR.
HOUSING STRATEGY FOR KHARTOUM NORTH DIIRMS.

This chapter is mainly introduced to devise a housing strategy for Khartoum North Diirms considering the world's experience in devising housing strategy as well as housing situation in the Sudan. This will provide some basis for the development of the area.

1. The Development of Housing Strategy in the World

The general aim of housing strategy is to develop programmes or urban development which could provide the basis for the adequate fulfilment of people's housing needs. Within this general aim certain importance objectives should be put in mind:

1. The emphasis is to be on the use of new resources and eliminate as far as possible the destruction of existing housing.

2. To stimulate the willingness of people to participate in financing their own housing. In this respect certain self-help could be utilized.

3. To provide different standards of housing to cover different income-groups within different

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1/ Overseas Division, Building Research Station, Third Urban Housing, Grasmo Watford WD2 7JR, United Kingdom.
human resources and housing needs.

4. To make sure that the available housing resources as much as possible equally distributed among different income-group.

Any housing strategy should be passed through certain stages, we list the three important:

1. The analytical stage: In which basic information about the place is made available mainly covers the conditions of the people and their housing situation.

2. Development Stage: In which the information is to be converted to objectives and criteria.

3. The proposal stage: In which the options are to be selected.

One of the first task in devising a housing strategy will be the assessment of the future population structure. This will cover the new household arising from natural growth and the new immigrants household. The housing need projection will also consists of the following elements:
a) To relieve the overcrowding in existing housing areas.

b) The removal of urgently substandard areas.

Standards which concern planning are primarily classified to four stages:

1. Planning Standards.
2. Construction Standards.
3. Development Standards.
4. Human Resources Standards.

In any newly built area the residential land use will be dominant say 50 per cent to 60 per cent followed, in importance, by road say 20 per cent to 30 per cent with open space and non-housing use 20 per cent to 25 per cent. These standards provide a density about 250 to 500 p.p. ha. in Jamaica, and 300 to 600 p.p. ha. in Tunis. 1/

2. Upgrading Project:

The term upgrading is used to describe the improvement of social and physical infrastructure within an existing settlement and the self-build improvement of the houses by their occupants. In any upgrading project certain principles should be considered:

1/ Overseas Division, Third World Urban Housing.
1. To look over the bright side of existing housing and infrastructure.
2. To provide level of services that government and people can afford.
3. To introduce incentives for the people to improve their own housing through their own efforts.¹

It is necessary to present the experience of Indonesian people in well planned upgrading project, their work depends on some principles as follows:

1. Don't reduce the housing stock.
2. Provide open spaces.
3. Protect and improve the communal relationships.
4. Can be carried out on scale which makes a major impact on the problems.
5. Can be carried out at a cost which the government can afford.
6. Can be carried out at a cost which the people can afford.
7. Can be carried out very quickly.
8. Can be carried out by simple technology.
9. Can be carried out for predictive development.²

¹/ Ibid.
²/ Ibid.
3. When to Upgrade and when to Clear:

Such circumstances can be summarized as follows:

1. Where there is multi-household occupancy of unsound multi-storey building.

2. Where the land is urgently needed for non-housing uses.

3. Where the scale of the problem is small and the redevelopment can be carried out at a cost which can be affordable by people and government.

4. Where the physical problems prohibit the implementation.

The success of upgrading scheme depends largely on the active involvement and co-operation of the occupants by mutual self-help residents.

In Indonesia the traditional community is allied with governmental structure and as much as potentially the most effective means executing and monitoring the upgrading project. 1/

At local level government administration in Jakarta has five mayoral districts, the city is divided into 27 districts each headed by district chief and 227

1/ Ibid.
sub-districts each headed by sub-districts chief. Each sub-district comprises between 45,000 to 50,000 people who are sub-divided into two levels of community groups. The larger of these contains about 150 families and the smallest about 30 families. Each of these groups is headed by a man who lives in the group, his task is to organize co-operative community efforts, to build roads, footpaths and drainage. 2/

The major objectives of the upgrading programme is to bring a lower-income residents into the fabric of urban life. 2/

4. General Characteristics of Housing in the Sudan:

In general housing in the Sudan is characterised by the following:

1. Residential areas are classified to first, second, third and fourth classes.
2. The size plot are 800 sq.m. to 400 sq.m. and 300 sq.m. for first, second and third classes respectively. The fourth class has no specific size but it is usually 200 sq.m. or less.
3. Basic services provision is inadequate and is almost all concentrated in certain towns in

1/ Ibid.
2/ Ibid.
first, second class plots and to a limited extent in the third class plots.

4. Thirty nine per cent of the residential plots in the urban areas are leased on a permanent basis in first, second and the third classes. Only 4.5 per cent being in first and second classes. All other houses are on temporary leasehold.

5. Residential densities are very low ranging from 1-5 plot per hectare for first class down to 1-5 plot per hectare in fourth class areas. Due to the low densities it has been found that about 50 to 120 sq.m. per person and 8-10 to 9-1 person per plot.

6. Traditional building materials account for 65 per cent and 61 per cent of Gishra and Jalous respectively, both with Baladi roof.

5. Rehousing Experience in the Sudan

The Sudan as one of the third world countries lacks adequate provision in housing sector. There is an imbalance between housing supply and demand. The main factor behind the inadequacy of housing provision is the clear shortage
in services provision such as water supply, electricity and roads as well as the shortage of building materials in spite of the availability of local building resources.

The Sudanese towns have been faced with the influx of in-migration from rural areas particularly to the major urban centres. This movement of population creates a direct shortage in housing provision on the one hand and the emergence of squatter settlements on the other. Due to the emergence of illegal settlements the municipal authorities have adopted rehousing schemes for these squatter settlements. These rehousing schemes have achieved its objectives successfully.

There are main features which characterised the squatter settlements particularly in Port Sudan. The location of some of squatter settlements were not suitable for housing, due to sand dunes and water courses that intercept these locations. Also the hazards due to sitting close to animals sheds or the primitive tenancy have a direct effect on life. The areas are also infested by flies and causes different diseases.

One of the major rehousing schemes adopted in the late 50th, was Dier Omra(\textsuperscript{*}) which lay west of Port Sudan.

\textsuperscript{*} Dier: Local name for the neighbourhood.
Omra: Boha local name for the neighbourhood.
The plan had been designed and approved by the planning authorities. A clear site had been prepared to accommodate the evacuees. The plan consisted of residential blocks and basic services.

The implementation was started by constructing water mesh, system for the new site. Kiosks were built and connected to the pipe system which had been constructed.

A general strategy had been put for the work. Each day 40 dwellings were dismantled and removed to the new site.

The process of evacuation was executed by the supervision of several committees which were established to organize and control the work. Moreover these different committees were to report about the process of implementation of the rehousing schemes. 1/

6. Low Cost Housing in the Sudan.

On the national level housing problem in Sudan has been considered of great importance. The housing department adopted an experimental scheme, the main objectives of which are as follows:-

1. To design economical houses which will suit the needs of low-income group.
2. To improve neighbourhood planning and to create the self-identity of the neighbourhood. This will create the necessary physical, social, and psychological harmony between the neighbourhood and its people.
3. To use local materials in order to save hard currency.
4. To supply the positive result in the future all over the country.

Two types of houses were designed to suit families of 4-6 persons and 6-9 persons. After the success of the experimental scheme a high programme was introduced to provide 122 houses distributed as follows:

1. 22 small houses for families of 3-5 persons.
2. 55 medium houses for families of 4-6 persons.
3. 45 big houses for families of 6-10 persons.

This distribution came as a direct outcome of the family structure. It appears from the above account that the medium family size 4-6 persons is dominant in such category of population. 

The total population of the three housing categories is about 723 persons. The total area is 46,256 sq.m., i.e., about eleven feddans. The total built-up area is about 29,986 sq.m., respectively. Roads and open spaces cover 10,270 sq.m., representing about 35 per cent. The gross density is about 66 persons per feddan which is about 63.5 sq.m. per person.
CHAPTER FIVE.
POLICIES TOWARDS SOLUTION.

1. General Strategy:

The aim of this chapter is to suggest how the area could be developed by improving the general environmental condition and to provide adequate services through the utilization of the existing natural resources in order to achieve the appropriate solution for the problems of the area. Therefore specific objectives are put to fulfil this strategy. These objectives could be summarized in the following:

1. To solve the problems of landownership for the benefit of the low-income group.
2. To maximize the situation of the existing resources and eliminate as much as possible the housing destruction.
3. To reduce the current density of population.
4. To stimulate the willingness of the people to participate in the scheme.
5. To provide the area with basic services.
6. To stimulate social integration between the neighbourhood.
2. Planning Standards:

On the national level housing standards has been adopted. The residential uses constitute 60 per cent of the total area. The open areas and roads represents 20 per cent while the communal services constitute 20 per cent of the total area.

The standard of plot density per hectare is 30 plot in the third class residential area. The average density of population is 180 persons per hectare. The average density per plot is 6 persons.

3. Proposals:

To achieve the above mentioned objectives for the development of the area, it is necessary to sort-out alternatives. These alternatives are listed as follows:-

1. To upgrade the area to a third class area and introduce some improvements.

2. To upgrade the area to a third class area bearing in mind that plots adjacent to the major roads should be upgraded to second class standard.

4. Examined Proposals:

To evaluate the first proposal it is important to consider the existing condition of the area as well as identify the factors which might prohibit or help the
implementation of this proposal, taking into account that Khartoum North District are considered as fourth class area and inhabited by low-income groups.

Testing this proposal it is necessary to pay more attention to the economical base of the area, according to survey findings the per capita income is low. It constitute about 80 per cent of the total labour force in the area. Furthermore there are some factors which might support this proposal. These factors are:

1. The area is inhabited by low-income groups.
2. The standard of plot size is ranging between 180-200 sq.m.
3. To reduce the density of population and to minimize the plot size standard is recent government housing policy.
4. To retain as far as possible the existing housing situation.

To evaluate the second proposal it is necessary to identify the factors that might create difficulties in implementing this proposal. Perhaps, the implementation of such proposal adds a host of new problems to the existing situation. So I propose certain factors which should be put under consideration:
1. The second class standard is ranging between 400-600 sq.m. It will be necessary to join two plots to each other to enlarge plot size.

2. Some of the roads might be reduced or closed to enlarge plot size.

3. The occupants of the proposed second class can not afford to build second class standard.

4. The occupants can not afford to pay the cost of enhancement to the government.

5. The government can not afford to support the occupants of the proposed second class to improve their dwellings.

5. Solution:

The proposed adopted is to upgrade the area to third class and introduce some improvements, because through this proposal the above mentioned objectives are believed to materialize.

Recently the Sudanese government applied a housing policy in order to reduce the population density and minimize the size per plot. This trend has been carried to enhance the level of services provision and to improve the general environmental conditions to satisfy the needs of the people.
Khartoum North Districts are of an area of about 38 hectares. This covers a residential area which constitutes about 35.8 hectares and about 22.8 hectares for the infrastructure. The area is inhabited by a high density of population which reaches about 13,750 persons in a congestion situation. The current density in the area reaches about 237 persons per hectare. There is about 34 plots per hectare with an average density of 10 persons per plot.

In the light of data analysis which has identified the problems facing the area, it is seen necessary to adopt a replanning scheme to improve the current situation of the area in terms of reducing the population density and providing a reasonable level of services that will satisfy the human needs.

The replanning scheme will cover the whole area and its primary aim is to upgrade the current situation to reach the level of third class standard, taking into account that the housing policy of the government is to reduce the density of population and to minimize the size per plot.

Applying the planning standard which has been mentioned previously, round about 6,550 persons will be
re-housed in the old site. About 7,200 persons will be evacuated to the proposed new site and service scheme. 1,091 families will be re-housed in the old site, the remaining will be accommodated in the new site and service scheme.

The proposed new site and service scheme will be located at governmental residential land reserve in Khartoum North. It should not be far away from the town centre particularly from Khartoum North industrial area. Moreover the evacuees should preferably be located or accessible way of public transport in order to be linked with the occupational centres.

The rehousing process will start by breaking down the different communities of the old site to facilitate the sharing of services. Each community will be provided with a communal open area to stimulate social relationships between the people within the community as well as between them and those of the surrounding areas.

A provision of rational infrastructure is proposed for the old and new sites to serve the whole community in a proper hierarchical system. This could be summarized as follows:
1. The old site will be provided by a primary school for boys to accommodate 50 per cent of the age group concerned. The old site has a primary school for boys and two schools for girls. Based on my research findings I propose that the area needs one primary school for boys. The new site will be provided by a full service of primary schools.

2. The two sites will be provided by two health centres, one for each site. The total area of each centre will be about 5,000 sq.m. to serve 7,000-15,000 persons.1/

3. A mosque will be provided for each site.

4. Social clubs and Jawias will be provided for each site.

5. Each site will be provided by a market area.

6. Police station, youth centres and people's council halls will be provided for each site.

7. Communal services will be provided particularly open spaces and playing fields.

8. Each site will be provided by water, electricity and drainage system service.

9. Each site will be provided by rubbish collection points.

10. A system of hierarchical roads shaded with trees will be provided for each site.

All these services mentioned above are suggested to modify the existing condition in the area.
CHAPTER SIX.

PROPOSALS FOR IMPLEMENTATION.

After completing the plan design, the proposal will be implemented in order to develop the area. The execution will be in a form of integrated process.

The first phase of implementation will be a review of the existing situation of land ownership. The target in mind is that, people must be given the leasehold and land must be registered. The inhabitants must be given a full leasehold and their plots must be registered in their names.

People are expected to resent movement to a new site or might oppose the idea of replanning, particularly those who will be removed to the new site. It is recommended that the members of People's Council will carry the task of convincing the inhabitants by explaining to them the objectives of the replanning scheme. If there is opposition the government will encourage the inhabitants by introducing incentives for those who will be removed. The incentives could include building materials, loans and the like.

The replanning scheme will follow a certain specific processes. The inhabitants are to be classified as follows: -
Those who:
1. Own leasehold.
2. Owned and occupied the house but not provided by leasehold.
3. Owned more than one house.
4. Practice prostitution.
5. Produce and sell local brew.

The priority will be given to those who own leasehold. Those are to be rehoused in the old site.

The inhabitants who owned houses and occupying these houses, but are not provided by leasehold. Those are to be rehoused in the old site. The extended families should be broken down, because the plot size is small and not adequate to accommodate such a large family. The original part of the extended family should be accommodated in the old site. The branches of the extended family will be removed to the new site and service scheme.

The inhabitants who own more than one house should be given only one house while the rest of the houses they own should be confiscated by the government to be used for purposes of better allocation i.e. given to others.

Tenants are recommended to be moved to the new site and service scheme. It is recommended that owners of houses of prostitution and the local brew activities should
be given a certain period to evacuate their houses. In case of continuity of these activities the government will have the right to confiscate these houses and convert them to other purposes.

It is recommended that the average density per plot will be 6 persons and the size of plot will be 200 sq.m. in each site. This will be applied in the old site and the new proposed site and service scheme.

As an initial phase the infrastructure system will be constructed for the rehousing scheme. Water pipes will be designed and distributed over the two sites. The two sites are recommended to be provided by electricity as well as drainage system.

The population will be fragmented to small community. Each community consists of individuals representing different tribes, to activate the social interrelationships between the individuals. Each site will be divided to five localities, each locality will be occupied by a community composed of different tribes. (See Structure map).

The old site has three primary schools. One school with two streams for boys. Two primary schools for girls, one has two streams. One primary school for boys
FIG. 5 STRUCTURE PLAN / SCALE 1:5000

- RESIDENTIAL
- SERVICES
- PUBLIC PARK
- PUBLIC SQUARE
- PLAYING FIELD
is recommended to be provided for the old site. (See Structure map).

A house of handicapped people is occupied by about 15 persons. It is recommended to be demolished and replaced by the proposed primary school for boys. The handicapped people will be evacuated to a similar social establishment particularly to (El Shabia's) because a similar establishment is located there. (See Structure map).

Pupils at the age of general and high secondary schools will be accommodated in the schools of the surrounding area, particularly (El Shabia's) school, because these are located not far away from Khartoum North Diema. (See Survey map).

A health centre of a total area about 5,000 sq.m. serving about 7,000 to 15,000 inhabitants is recommended to be provided for the area to perform the health services.

The existing mosque is recommended to be extended in the adjacent open area to accommodate the high numbers of prayers. According to my personal observation the present mosque is inadequate, because a considerable number of people are praying outside the mosque building.

The existing local market should be removed to a new site fixed in (El Hag Yousif), according to a decision
taken by the provincial authorities. So it is recommended to provide each site by a market area. (See Structure map).

It is recommended that each site will be provided by a police station with enough police power to keep security in the area.

People's council hall is recommended to be provided for each site because it serves the inhabitants by performing different services.

Each site will be provided by youth centre to stimulate the recreational activities in the area and to create social integration between the inhabitants and those of the neighbourhood.

It is recommended that each site will be provided by five Zawias. Each one is to be located in a locality. The aim is to stimulate and encourage the practising of religious activities.

There is poor housing. Poor in its structure and has a bad condition. All houses are built of mud and lack basic services. Furthermore these houses are occupied by prostitutes and people producing brew. Due to these activities the neighbourhood, are disturbed and a
sort of corruption occurs as well as it caused noise in the area. This square is recommended to be demolished and replaced by a public park to be as a recreational place for the inhabitants, taking into account the occupants are not owned these houses. The owner will be compensated in the new site and service scheme. (See Structure map).

Open spaces are to be provided for each site. It is recommended that houses which are confiscated by the government should be converted to open spaces.

Social clubs are of great importance. Each site is recommended to be provided by social clubs. Five social clubs are recommended for each site and should be distributed among the five localities (See Plan of Locality).

Each site is recommended to be provided by a playing field for leisure activities. The craftsmen who occupied the eastern side of the existing playing field are recommended to be removed with the local market to (El Hag Yousif). The local market included similar crafts activities.

The inhabitants who will be evacuated must be accommodated in a site and service scheme. The government is to be responsible for providing each site by services.
The Local Government should encourage the inhabitants to plant trees. The authorities can provide the inhabitants with trees in co-ordination with the Department of Horticulture. Care for these trees should be made. This will help in improving the general micro-climate in the area, reducing the effect of dust and creating shaded areas.

1. Finance

Financial sources for this scheme should include self-finance. Nominal prices for land of 50 p.t. for sq.m. should be paid and about 25 p.t. for sq.m. should be paid for services. The total cost is 175 p.t. for sq.m. This will constitute the total payment, and should be paid in monthly installment. This money should be budgeted to provide the replanning scheme.

The inhabitants should participate in the scheme by collecting money to help in the execution of the scheme. Also they are expected to contribute by self-help, in building their own houses by their own efforts. Houses should be designed in a prototype pattern to
utilize the maximum land resources in a way that will be comfortable and suit Sudanese traditions.

2. **Control:**

The replanning scheme should be implemented under full control to eliminate expected drawbacks that might occur. The body of control should include members nominated by the local government in addition to members nominated by the inhabitants. The responsibility of this control is to supervise financial sources and follow up programme of implementation. In general the body of control is to manage the proceedings of the replanning scheme.

3. **Follow-up:**

A committee that represents different experts is suggested to be formed. Its role should be to supervise the process of implementation. I suggest that in this committee the following members are to be represented from different departments and ministries:

- A member from Department of Planning.
- A member from Department of Survey.
- A member from Public Works.
- A member from Water and Electricity Corporation.
- A member from Municipality.
- Two members representing the inhabitants.
This committee is recommended to submit a monthly report to the provincial authorities, explaining the proceeding of the implementation.
SUMMARY AND CONCLUSIONS.

Khartoum North Diems came into existence as a result of rehousing scheme which was adopted by the provincial authorities for the squatter settlements. This squatter settlement was a direct consequence of the rapid movement of people attracted by the establishment of Khartoum North industrial area, as well as establishing of River Transport Department in the early 20th century.

The population in Khartoum Province grew rapidly during the last decades. The census of 1973 indicated that the population doubled in the last period. Khartoum North Diems has been affected by this increase of population because it is located not far from Khartoum North industrial area. Most of its population are immigrants from other provinces particularly the northern provinces.

There are major problems which characterized housing in this area. Generally the housing conditions are poor. It is a fourth class area. The plot size is small and inadequate to accommodate a high density of population. The local building materials in quite common in this area particularly mud and Baladi roof. Sanitary services are distributed in an irrational pattern. The existing
resources of land are not utilized properly.

The houses occupancy is more than one household 78.5 per cent of houses are rented and each house is shared by more than one household.

The area is inhabited by the low-income groups whose incomes are generally low. The majority of them work in Khartoum North industrial area as well as the commercial centre.

The area lacks the necessary social activities. The ratio of illiteracy is high relatively to educational services available. These services are inadequate. Due to the inadequacy most of school age groups in the area seek placement in the schools of the neighbourhoods.

Adequate public health services are not available in the area. Usually the inhabitants go to the nearest health establishment for medical care.

In the area there is a local market which serves the entire of Khartoum Province. Besides these services the area is provided by other social services but of small scale.

The area is served by utility services. Most of houses are connected by electricity and water. The drainage
system is poor and inefficient.

The high number of population with the inadequacy of housing provision is the reflection of the poor conditions and the deterioration of the general environment.

The aim of this project is to develop and to promote the current situation by devising a housing strategy for Khartoum North Diema, taking into account the world's experience in the housing field. It is necessary to adopt a program for development in order to satisfy the housing needs of people.

Certain objectives has been put for the development of the area, by improving the general environmental conditions, to maximize the utilization of land resources and to encourage the inhabitants to participate in building their dwellings by their own efforts in as much as possible.

As a result of this a rehousing scheme is recommended to be adopted for the area. The entire population is to be divided into two parts according to a certain criteria. One of these parts is recommended to be accommodated in the old site. The other is to be evacuated to a new site and service scheme. Both sites are to be provided by
social and utility services. Furthermore it is recommended that the inhabitants must be given a lease contract to identify their property ownership.

As a conclusion, Khartoum North Diema is mainly characterized by many problems including poor housing condition, high density of population, congested in an inadequate situation, as well as a direct deterioration of the physical environment.

I hope that this paper can make some contribution to check these problems. In this paper a modest attempt was made to explain problems of Khartoum North Diema following by recommendations in order to solve the various problems facing the area and its inhabitants. I hope that what I did could be of some use for others in studying this or similar problems of Khartoum North Diema.
Housing Socio-Economic Survey by sample quota method for Khartoum North District.

1. Name of the town: ....

2. Name of the district: ....

3. Number of square: .... Number of houses: ....
   Plot size: ....

4. Name of the head of the household: ....

5. Social Information about the Household:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>TR</th>
<th>Place of Birth</th>
<th>Relat.</th>
<th>Marit.</th>
<th>Standard</th>
<th>Sex</th>
<th>Age</th>
<th>Live</th>
<th>Status</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

6. Economic Information about the household:

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Place of Work</th>
<th>Occupation:</th>
<th>Other</th>
<th>Per Capita:</th>
<th>Average:</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

7. What is the means of transport you use? ....

8. Did you reside in any other neighbourhood before? ....
   Yes ....
   No ....
9. If the answer "yes" asked about:

10. Where did you live before?

11. When did you move?

12. Reasons behind your residence?
   - Because there are some relatives already living in this area.
   - Have been shifted from the other areas by local authorities.
   - Have been granted a plot by the authorities.
   - Because it is relatively within a short distance from place of work.
   - Because of high rate of renting in other districts.
   - Any reasons.

13. Do you want to stay permanently in this district?
    Yes....   No.....

If the answer "No" asked about:

14. Why do you want to leave?

15. In which district do you want to live?

16. Why do you choose this district?

17. In case of illness, where do you go?

   Faki:  Baseer:  Dispens:  Health  Hospital  Specialized
   (x)  (xx)  (xx)  (xx)  (xx)  (xx)  (xx)
   (xx)  (xx)  (xx)  (xx)  (xx)  (xx)  (xx)

(x) Faki: Local name for a person who treat his patient by Islam principals.
(xx) Baseer: Local name for person who treat his patient by medical traditions.
18. Condition of the house  
   - Rented...  - Owned.....

19. If rented, asked about:  
   - Amount of rent rate:............

20. Nature of Residence?...  
   - One family or (Batchelor)
   - Two families or more (How much?).....

21. Number of rooms:...........

22. Types of Buildings and roofs:

<table>
<thead>
<tr>
<th>Walls</th>
<th>Tins</th>
<th>Board</th>
<th>mud</th>
<th>Gishra</th>
<th>Mud</th>
<th>Brick</th>
<th>Concrete</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Roofs</th>
<th>Iron</th>
<th>Metal</th>
<th>iron</th>
<th>Iron</th>
<th>Iron</th>
<th>Steel</th>
<th>Others</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

23. Is there any water supply installation?  
   - Yes.  - No

24. If the answer "No", asked about:  

25. What are the means of water supply?

26. Is there electricity supply?  
   - Yes.  - No
27. Domestic services:

<table>
<thead>
<tr>
<th>Type</th>
<th>Available</th>
<th>Private</th>
<th>Shared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathroom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latrine</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

28. What type of latrine do you have? ....

29. Are there any animals in the house? ....

30. What types: ...................... Number of Animals: ......................
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