VILLAGE RESETTLEMENT SCHEME
THE CASE OF GUDE COMMUNITY, KANO

BY
SALISU AHMAD ABBA
B. SC(HONS) ARCHITECTURE,(ABU)

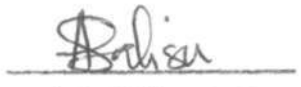
A Thesis submitted to Post-graduate School, Ahmadu Bello University, Zaria in partial fulfilment of the requirements for the Award of a Degree of Master of Science in Architecture.

Department of Architecture
Faculty of Environmental Design
Ahmadu Bello University
Zaria, Nigeria.

DECEMBER, 1992.

DECLARATION

I, Salisu Ahmad Abba of the Department of Architecture, Faculty of Environmental Design, Ahmadu Bello University, Zaria here by declare that this thesis has been written by me and it is a record of my research work. The work has not been presented either wholly or partly for any degree elsewhere before and all sources of information have been dully acknowledged.



SALISU, A.A.

CERTIFICATION

This thesis entitled: Agricultural Village Scheme, Gude resettlement scheme Kano by Salisu Ahmad Abba meets the requirements governing the award of the degree of Masters of Science in Architecture of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

CHAIRMAN: SUPERVISORY COMMITTEE — DATE 28/4/93

MEMBER, SUPERVISORY COMMITTEE — DATE 29.4.93.

MEMBER, SUPERVISORY COMMITTEE — DATE 29/4/93

HEAD, DEPARTMENT OF ARCHITECTURE — DATE 20/6/93

DEAN, POSTGRADUATE SCHOOL — DATE

DEDICATION

This thesis is whole heartedly dedicated to:

My mother Khadizatul Kubura Salisu

My father Mallam Salisu Adamu and

My beloved wife Asma'u Hamisu Umar.

ACKNOWLEDGEMENT

I begin in the name of Allah (SWT) the beneficient the merciful. All praise be to Allah, the sustainer of the universe, who guide and spared my life to the end of my course. I wish to express my gratitude to my Deputy Director Architecture Salisu Musa Tahir of M.O.W. & Housing Kano for his assisted toward the successful completionof this M.Sc. course.

My sincere thanks goes to the head of Department Dr. O. Solanke for his fatherly concern over the students in the department. I am greatly indebted to my supervisor Arc. M.D. Ahmad who always made himself available when the need arises. Also I wish to render my thanks to some lecturers like Arc. A. Salisu, Mr Yabuwa, Arc. Qurise and Arc. Madu D.

I am also duely indebted to my parents for their support, encouragement, concern and advice throughout my life.

I owe aspecial thanks to my senior brother Ismaila Yunusa Ilu for his persistent encouragement and advice in realising this dream.

My very special thanks goes to the following who have contributed in more ways than one, Abubakar S. Bello, Najib Habib, Aminu Bello Abdullahi, Ulgini M.L., Saleh S. Ibrahim, Mrs. Maigida, Haruna, Muktal Abdulhamid.

Shehu M. Kankarofi, Arinde S.H, Abdul Iguda, Abdulkarim Dankawo, Ali Inuwa, Balarabe Sabo, Adamu Galadima, Mohammed S. Abba, Haruna Abubakar, Mustapha B.B.R. Garba Zubairu, Mr. Dennys of the Department of Library and Information Science, for typing the thesis and a host of others whose names are numerous to mention.

I salute you all, and may Allah's blessings shower on you always (Amin).

ABSTRACT

In recognition of the priority given to rural development, the campaigns for the use of available local building materials and the emphasis on the culture by this country, it is the aim of this thesis:

To attempt a resettlement of the displaced people given them habitation that respect their tradition, culture and architecture; And to investigate the existing situation in the settlement of Gude people.

The thesis will also try to appreciate the unbreakable family and community ties in order to strengthen their relationship through the physical planning and arrangement of spaces that will give them their contemporary culture and nature of their settlement.

To achieve the goal, the proposal adopted the tradition concept of centralisation communal facilities and the inclusion of small communal open spaces within wards and clusters. Also three types of housing prototypes were proposed in accordance with identified three types of family structure.

The development of the houses can be stages. Due to variation in the requirement of the people these should be subject to alteration by the owner with approval of the appropriate authority.

Furthermore, these research work will go into evolving a valid, meaningful and realistic Architectural proposal for the resettlement of Gude village. It is hoped this will serve as a model in the state for future resettlement programmes.

TABLE OF CONTENTS

		Page
Title page	.. ..	i
Declaration	.. ..	ii
Certification	.. ..	iii
Dedication	.. ..	iv
Acknowledgement	.. ..	v
Abstract	.. ..	vii
Table of Contents	.. ..	ix
List of Table	.. ..	
List of Plates	.. ..	
List of Appendices	.. ..	

CHAPTER ONE - INTRODUCTION

1.1	Preamble	.. ..	1
1.2	Statement of Problem	..	2
1.3	Design aim and objective	..	3
1.4	Scope and limitation	..	4
1.5	Research Methodology	..	4
1.6	Conclusion	.. ..	5

CHAPTER TWO - Existing Situation(Gude Village)

2.1	Historical Origin of the people		7
2.2	Socio-cultural	..	9
2.3	Demographic Data	..	12
2.3.1	Rate of growth of population	..	12
2.3.2	Age and Sex Distribution	..	13

		Page
2.3.3	Room occupancy ..	16
2.3.4	Family sizes and Habitable Room	17
2.3.5	Religious structure ..	18
2.3.6	Occupations structure/Economy ..	19
2.4	Physical characteristics ..	20
2.4.1	Topography	20
2.4.2	Wind	20
2.4.3	Temperature	22
2.4.4	Sunshine	23
2.4.5	Rainfall	23
2.4.6	Relative Humidity ..	25
2.4.7	Vegetation	25
2.4.8	Hydrology	27
2.4.9	Geology	29
2.4.10	Climatic Design Implication ..	29

CHAPTER THREE- Case Studies of Resettlement Schemes

3.1	Brief History of Resettlement Scheme	34
3.2	Teme Manhean Ghana ..	36
3.2.1	Introduction ..	36
3.3.2	Resettlement Policy ..	37
3.2.3	The proposal ..	39
3.3	Kainji Resettlement Scheme ..	42
3.3.1	Brief History ..	42
3.3.2	Resettlement Philosophy ..	44

			Page
3.3.3	Housing Policy	..	44
3.3.4	Amenities and Facilities	..	49
3.3.5	Material of construction	..	50
3.3.6	Financial Implication	..	50
3.3.7	Observations	..	51
3.3.8	Failures	..	52
3.4	Ushafa Resettlement scheme	..	52
3.4.1	Brief History	..	52
3.4.2	Resettlement Philosophy	..	53
3.4.3	Housing Policy	..	53
3.4.4	Amenities and facilities	..	56
3.4.5	Observations	..	56
3.5	General observation and recommendation		56
3.6	Housing case studies	..	58
3.6.1	Observations	..	72
3.6.2	Construction	..	74
3.5.3	General findings	..	75

CHAPTER FOUR - General Requirement for New Settlement

4.1	Site location	..	76
4.2	Size of settlement	..	79
4.3	Resettlement farming	..	81
4.4	Space Requirement	..	85
4.4.1	Basic functional spaces	..	85

Space

4.4.2 Space standards .. 85

4.4.3 Space hierarchy and Arithmetic 85

4.4.4 Space Requirement at ward level 88

4.4.5 Space at house level .. 89

CHAPTER FIVE - Concepts Development and Evolution

5.1 Established Design concepts .. 97

5.1.1 Site Zoning Concept .. 103

5.1.2 Site Design concept .. 103

5.2 Cluster Design Concept .. 105

5.3 House Unit Design concept .. 107

CHAPTER SIX - Design Report

6.1 Housing Units .. 110

6.1.1 House Type A .. 110

6.1.2 House Type B .. 111

6.1.3 House Type C .. 112

6.2 General Improvements .. 113

6.2.1 Openings .. 113

6.2.2 Ventilation .. 114

6.2.3 Latrines .. 114

6.2.4 Livestock .. 115

6.2.5 Kitchen .. 115

			Page
6.3	Distribution of Services	..	115
6.3.1	Water	..	115
6.3.2	Surface water Drainage	..	116
6.3.3	Waste product Disposal	..	116
6.3.4	Sewage Disposal	..	117
6.3.5	Electricity	..	117

CHAPTER SEVEN - Building Construction and Materials

7.1	Soil Stabilisation	..	119
7.2	System of Construction	..	121
7.3	Project Finance and Implication		123
7.4	Summary and Conclusion	..	124
	BIBLIOGRAPHY	..	125

LIST OF TABLES

TABLE		PAGE
2.1	Mean Anual Rate of Growth of population ..	13
2.2	Age Distribution ..	14
2.3	Sex Distribution ..	14
2.4	Room occupancy per person in different places ..	16
2.5	Habitable rooms and family sizes	17
2.6	Habitants per room in different places	18
4.1	Family size and family percentage	94
4.2	Family size and plot size ..	94
7.1	Mix soil cement proportion ..	121

3.14	Housing case study	..	73
4.1	Site analysis	..	78
4.2	Plot sizes and shapes	..	93
5.1a	Linear pattern	..	98
5.1b	Grid pattern	..	98
5.1c	Radial pattern	..	100
5.1e	Star pattern	..	100
5.1f	Loose pattern	..	102
5.1g	Multi centred pattern	..	102
5.2	Evolution of planning concept	..	104
5.3	Clustern design concept	..	106
5.4	Housing unit design concept	..	108

LIST OF PLATES

PLATE		PAGE
2.1	The Affected area ..	8
3.1	Plan of old Tema ..	38
3.2	Plan of New Tema ..	38
3.3	New Bussa Township ..	45
3.4	Semi-rural housing scheme ..	48
3.5	Elevation of a unit house ..	54
3.6	Additional building with a unit house	54
3.7	Village church ..	57
3.8	Ushafa health clinic ..	57

CHAPTER ONE

INTRODUCTION

1.1 Preamble

Presently in many parts of Nigeria, village resettlement schemes have already been built, and are being built and proposed for a variety of reasons. Most often it is due to national disaster like flooding, epidemic, strongwing or government policies such as man made lake, squarters clearance and so on.

However, in a situation where the movement is forced by natural disaster, the people usually takes it as an act of God. Therefore are ready to make all necessary sacrifices to provide for themselves a new settlement even with out the government assistance. But if the movement is as result of government policies, then the people naturally will expect and demand that adequate arrangement should be made so as to place them in a place where ought to be better than before. It is also expected that whatever is done for them should satisfy their socio-cultural and economic needs.

It is pertinent to state here that even when the exodus of people is necessitated by an act of God, it is expected that any responsible government will have to be involved in the relocation of the affected people. Eventhough the extent of participation may not be as much as when the movement is by government policies.

1.2 Statement of Problem

The constfuction of Magaga dam has lead the displacement and relocation of Gude Village with a total population of 2564 people. This is due to the change of the flood that might occur during the rainy season to inhabitants. Also water is sprinkling in most of the houses which caused health hazard.

The Kano State government is paying the compensation to the affected people while Kabo local government is responsible for payment of the new proposed site. The selection of site is done by the government officials in collaboration with village representatives. This ease some of the problems encourted by the past resettlement schemes. At the same time giving them prestige that inculcate sense of belonging as in their former settlement.

This project entitled Agricultural Village Scheme

attempts to resettle the victims of Gude on the proposed site.

1.3 Design Aim and Objectives

The aim of this thesis is to attempt a resettlement of the displaced people giving them habitation that respect their tradition, culture and architecture.

The above aim is hoped to be achieved through the following objectives:

1. To investigate the existing situation inthe settlement of Gude people.
2. To look into the socio-economic problems of employment in the study are to provide them with alternative farming. This would help to boast food production in the state in order to have self sufficiency and reduce the rate of rural to urban migration.
3. Finally, the people will be encouraged to participate in the construction of their various housing units which be in form of rural housing co-operation.

1.4 Scope and Limitation

Although the study has a very wide range of coverage, it is however meant to provide a valid, meaningful and realistic proposal for the resettlement of Gude Village. Hence this thesis will limit itself to the study and design of the following aspects.

1. The thesis will pay attention to the design and planning aspect of various house types, providion of various necessary facilities and amenities.

2. The thesis also target at identifying the housing problems in the study area with bias toward sanitation problems.

1.5 Research Methodology

The followihg methods are going to be adopted for the data collections:-

1. Physical observation will be used as field work where detail studies studies of the houseforms, layout and spatial distribution of space will be carried out.

2. Literature review as publication and articles will also be used as source of information for the thesis.

3. General appraisal of some resettlement schemes will also be carried out.

4. Indepth discussion with affected people.
Photograph and sketches.
Finally, personal observations and experience will also be added.

1.6 Conclusion

In line with federal government policy to alliviate problem of the rural dwellers in the country, it is the aim of this thesis to concludes with a proposal of habitation that respects the tradition, culture and architecture of Gude people.

It is hoped that this thesis Agricultural village scheme will help to improve the life standard of Gude people and consequently leads to the rural development.

REFERENCES

1. Chambers R. (1969), Resettlement scheme in Tropical Africa London, Routflidge and Keegan P.

2. Rimi A.M. (1986), Appraisal by Zobe Dam Agricultural Resettlement Scheme in Kaduna State, An unpublished M.Sc. (URP) Thesis A.B.U.

3. WRECA (1986), Kano: Report on Magaga Dama.

CHAPTER TWO

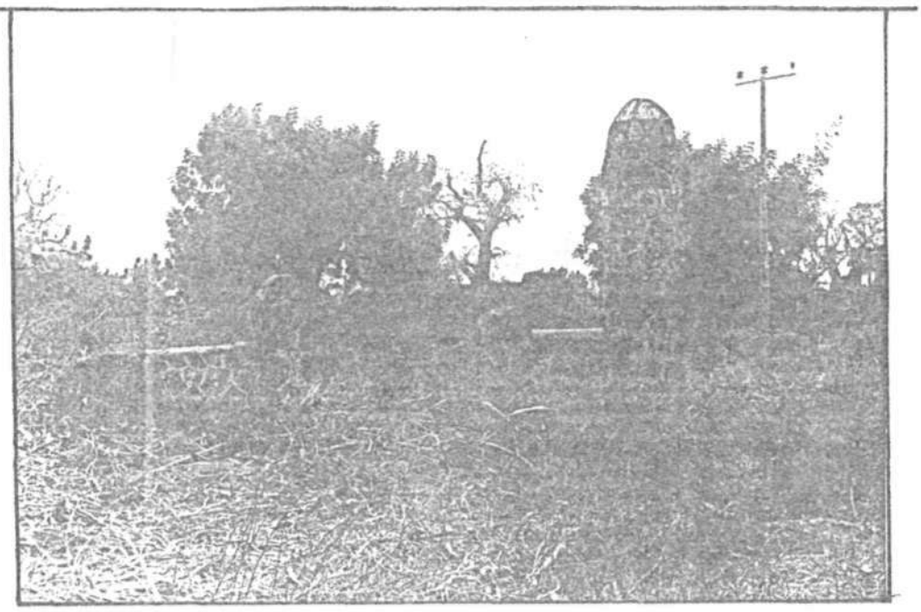
EXISTING SITUATION (GUDE VILLAGE)

2.1 Historical Origin of the People

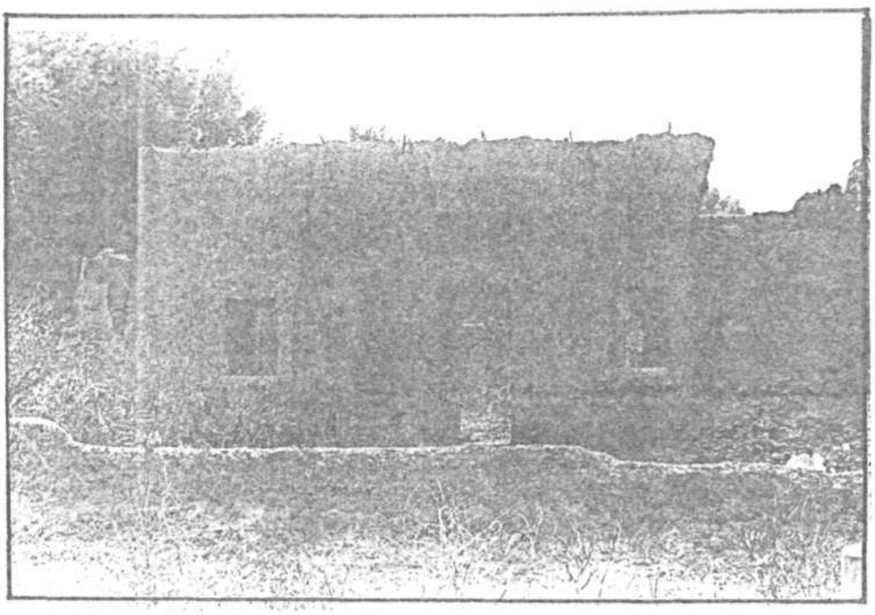
Historically, the inhabitant of the settlement namely Gude beloug to the Hausa ethnic group. The people of Gude migrated from Gwarzo in search of agricultural land and settled arouhd Magaga river. Later on due to population increase, they moved to present settlement which is under Kabo Local government authority.

The people of the area built a city wall (Ganuwa) around the village. The lay out of dwellings followed the old nucleated rural settlement pattern which defence was a majority in the past. The most significant aspect of physical appearance in Hausa settlements are the absence of plot limits in the past, the continous changes in the family structure which together tend to give the settlement an organic character. The first being a factor of irregular housing shapes while latter a factor of continous change in the appearance of the houses. (See plate 2.1)

PLATE 2.1



VILLAGE GATE.



VILLAGE MOSQUE

The layout of individual dwellings and the relation of one unit to another was derived from the system of socio-religious and political organisation. The village head compound and the central mosque were located in the centre adjacent to village square. The latter being the religious centre and the former the administrative centre. The most economic activity area being the market is set apart from the residential compounds for excreme privacy and possible for security from the strangers coming outside the village to the market (See fig. 2.1)

2.2 Socio-Cultural

Most of the socio-cultural activities that take place in the village are connected with religion. Notable among them are Sallah festival, that is Idel-Kabir. During these festivals people dress in their best cloth and go to pray ground which is the village square.

After prayers, people pay homages to their village head as part of traditional marking the festival. Also people exchange house visits among themselves. There are two festival mentioned above happen once a year at their respective.

FIGURE 2.1

COMMUNAL WELL



The Idel-Fitri takes place after the completion of Ramadan fasting while the Idel-Kabir during pilgrimage for people who can not afford to go Mecca.

Another important activities connected with Hausa people are the two ceremonies namely marriage and naming ceremonies. The marriage ceremony takes place when a girls hand is given to her husband. Before the marriage, the husband to be pays a regular visit to the girl for "Zance" and at times give her some "presents" (toshi) depending on the weight of his pocket.

After an agreement has been reached between both parents on their children's wedding. The dowry "Sadaki" is paid (from the husband's side), the marriage is contfacted by solemising it before an Imam and some elders of the society in the presence of well-wishers and relatives of the couple. The "Amarya" is the bathed and her limbs are put in green vegetable powder, "lalle". She is finally brought to her husband's house amidst fanfare and marriment in the night. Her belongs and all cooking untencils bought for her by her parent and well wishers are also brought for "jere". It is expected that before then the husband must have prepared his home ready to received his wife.

But the naming ceremony takes place seven days after the woman has given birth to a baby. At the time of a woman's pregnancy, she remains in her husband's house until she delivers. Then an elderly woman will stay with her to help her in bathing the baby and other domestic activities. The woman too will be having her bath with hot water for at least one month. In case of a woman of her first bath an elderly woman will teach her how to use leaves to beat her body using hot water.

2.3 Demographic Data

2.3.1 Rate of Growth of Population

The population of the affected people in the study area is 2564 out of which 40 percent are between the age of 5-15 years that is primary school age. The population survey was conducted according to ward; names:

Unguwar	Mahauta	349 people
Kofar	Gabas	752 People
Kofar	Tomma	958 People
Kofar	Kudu	505 People
Total		2564

The rate of growth of population varies from one area to another. For example the old city has a growth rate of 115 percent while Tudun Wada has a growth rate of 28.9%. Garo village has a growth rate of 3 percent and Fagge has a population growth rate of 14.5 percent. In the study area, the population growth rate is 2.5 percent. The lower growth rate of Gude is probably attributed to lack modern facilities and opportunities in the village. This make people to migrate to urban centre in search of white colar jobs (See table 2.1)

2.3.2 Age and Sex Distribution

The survey conducted showed that a considerable percentage of the population are under the age of 15 years. This indicate the potentials of labour force in the future. (See table 2.2)

Area	Mean Annual rate of growth
City	11.5 %
Tudun Wada	28.9 %
Garo	3 %
Fagge	14.5 %
Gude (study area)	2.5 %

Table 2.1: Kano State-Mean Annual Rate of Growth of Population.

Age and Sex Distribution

Ward Name	Children 1-15 Years	Adults 16-60 Years and above
Unguwar Mahauta	140	209
Kofar Gabas	301	451
Kofar Yamma	382	576
Kofar Kudu	201	304

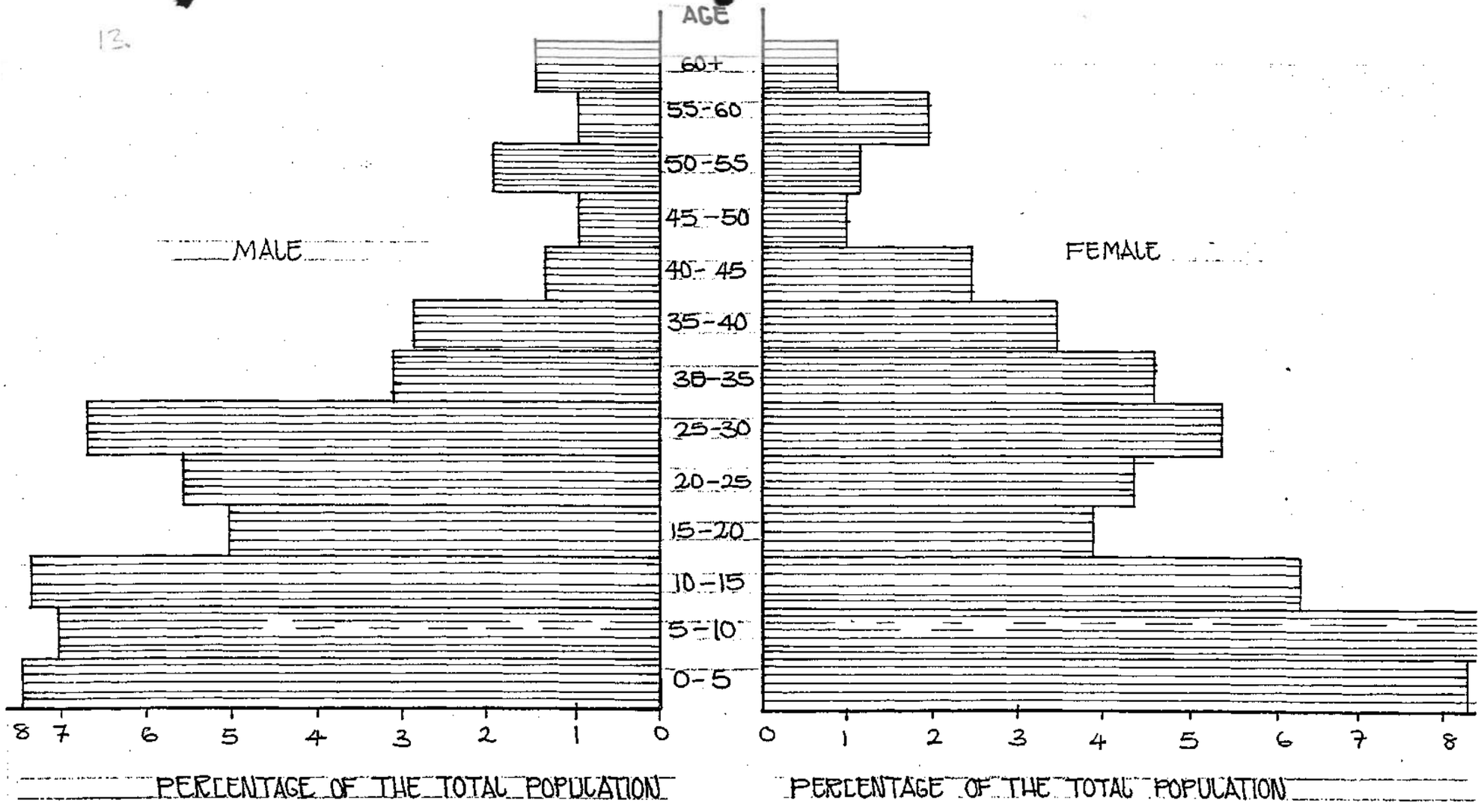
Table 2.2 - Age Distribution

Ward Name	Male	Female
Unguwar Mahauta	171	178
Kofar Gabas	368	384
Kofar Yamma	469	489
Kofar Kudu	247	258
Total	1255	1309

Table 2.3 - Sex Distribution

FIG. 2.2

13.


AGE
60+
55-60
50-55
45-50
40-45
35-40
30-35
25-30
20-25
15-20
10-15
5-10
0-5
MALE
FEMALE
8 7 6 5 4 3 2 1 0
0 1 2 3 4 5 6 7 8
PERCENTAGE OF THE TOTAL POPULATION
PERCENTAGE OF THE TOTAL POPULATION

2.3.3 Room Occupancy

Socio-religious aspects have been the reason that is reponsible for the avoidance of high room occupancy. This is due to the fact that each wife should have a minimum of separate room for herself and her children if not room and parlow. Apart from that, it is the custom that a household head should have his own room at his entire disposal.
If there are grown up children should have their own room at least 2-3 person in a room. This keep the room occupancy at a very low level.
Even though room occupancy is slightly higher in large families but there is no indication that even with the largest families successive room occupancy prevails.

Place	Persons Per Room
Gude (study area)	18
Tudun Wada Kaduna	4.2
Sabon Gari Kano	7.0
Fagge-Kano	3.0
Garo Kano	2.0

Table 2.4: Room occupancy per person in different places.

2.3.4: Family Sizes and Habitable Room

The house hold surveys carried out in the study area, it is noticed that the number of habitable spaces increases with increasing in family structure. (See fig. 2.3b)

Family Size	Habitable Room	% of Total Families
1-3 persons per family	2.1	14.5
4-5 " " "	2.7	28.6
6-7 " " "	4.0	30.3
8-9 " " "	5.4	11.3
10-11 " " "	6.7	9.6
12 plus " "	7.0	5.7

Table 2.5: Habitable rooms and family sizes

From above table, it can be seen that the number of habitable rooms per house hole is around 4 (with 7 as the average number of persons per household). This gives an average of 1.8 persons per habitable room. This is fair enough when compare with the figures in other places given below:

Place	Habitants/Room
Gude (study area)	1.8
Tudun Wada-Kaduna	4.2
Sabon Gari-Kano	7.0
Fagge-Kano	3.0
Garo - Kano	2.0

Table 2.6 - Habitants per room in different places

2.3.5 Religious Structure

The majority of the population are predominantly muslims having about 97.2 percent and the christians make up 1 percent while 1.8 percent are pagan. There is one central mosque near the village head compound and four small mosques with one in each ward. The christians used to go neighbouring village for their services.

With coming of Islam many religious injection introduced and have considerably influenced the style of living and world views of the inhabitants. This inturn has affected the physical pattern of the dwellings and settlements. These affected should

be taken into consideration while planning and design. The seclusion of women and seeking privacy for them, have had the most notable effects.

2.3.6: Occupational Structure/Economy

The main occupation of the population is farming and mostly every household has a farm. The people still use the traditional farming techniques. This method is by subsistance agricultural practice in which family labour is used on the farms. The implements used are mainly the rudimentary hoes and cutlasses where manure from animal dung ahd chemical fertilizer are the inputs. Very few of the farmers mix traditional method with mechanical irrigation farming.

The traditional farmers practise a system of mix croping where by three(3) types of crops are planted on the same land after certain intervals. This method of arming enhances fertility of the soil as practise in shifting cultivation. However, there are evidences of people with part-time job such as dyeing, weaving and tailoring.

2.4: Physical Characteristics

2.4.1: Topography

The study area is situated on an altitude of 450-500m above the sea level which is 56km along Kano-Gwarzo road. It is boardered on the west by Marovi village, on the south by River Magaga, on the north by Magaga dam and on the east by Garo village. The area consists of gently undulating plans with a Savannah type of vegetation giving a park-like appearance. The plains are broken by a number of wet season drains leading to the river around the site.

2.4.2: Wind

The Northern part of the Nigeria including the study area, is strongly influenced by two air masses:

1. The Tropical continental air mass
b. The Equatorial Maritime air mass

The tropical continental air mass is developed over the saharan Desert which is warm and dry. It blows in the opposite direction north-east to South west. The cool dry winds carry very fine dust particles from the Sahara, the dust is a result of surface turbulance caused by the wind

FIG 2.3

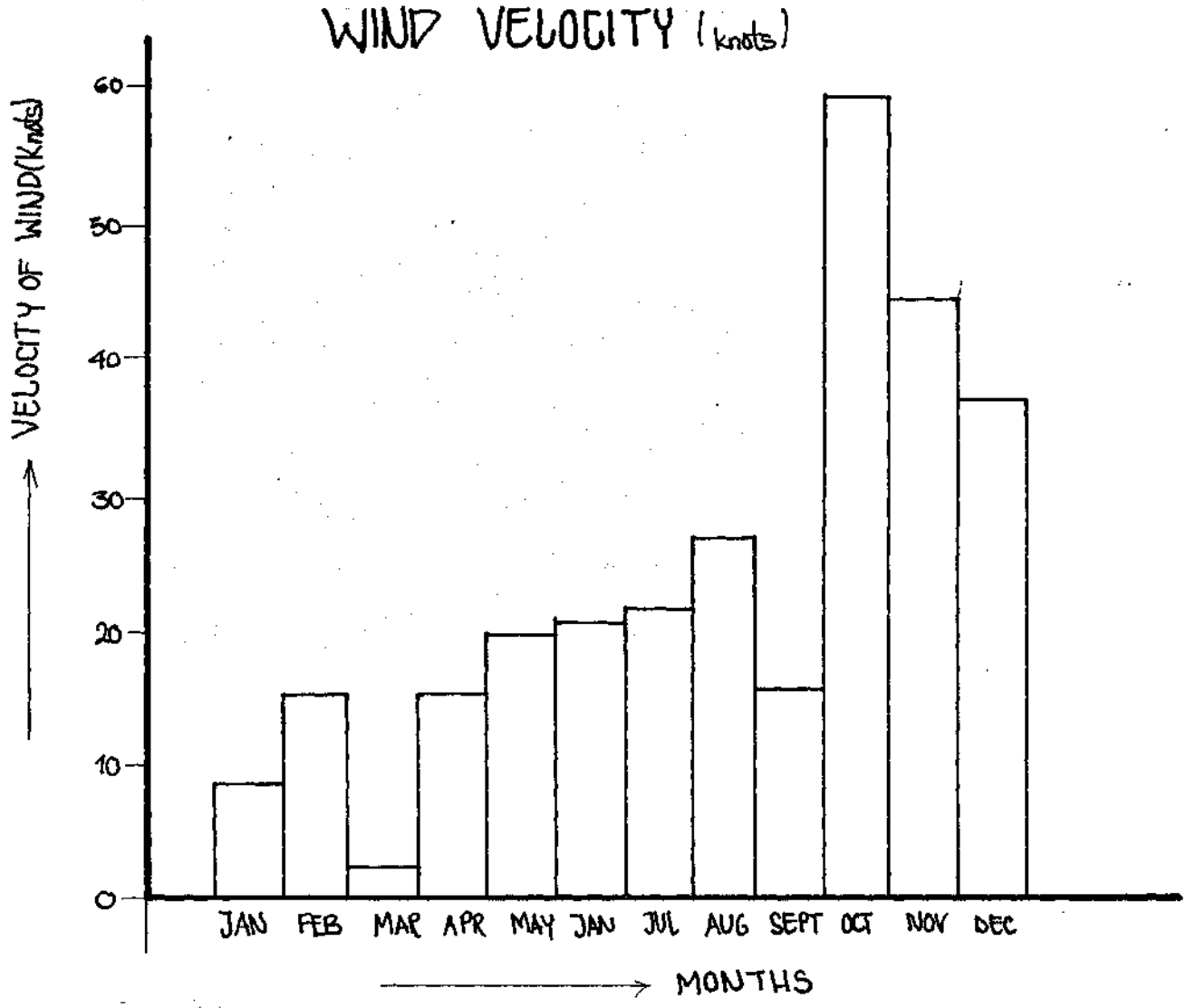
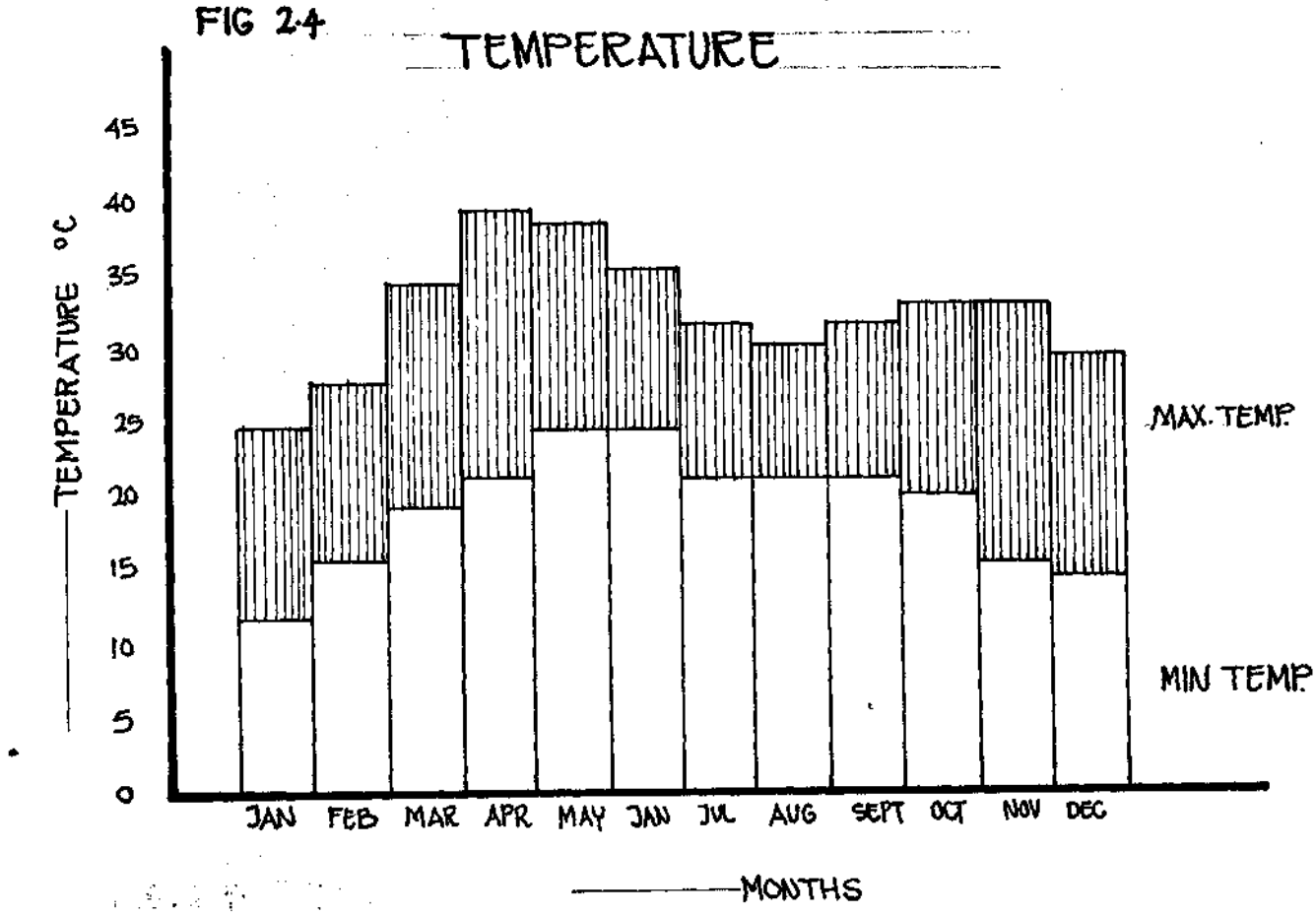

WIND VELOCITY (knots)
VELOCITY OF WIND(Knots)
60
50
40
30
20
10
0
JAN
FEB
MAR
APR
MAY
JAN
JUL
AUG
SEPT
OCT
NOV
DEC
MONTHS

FIG 2.4


TEMPERATURE
TEMPERATURE °C
45
40
35
30
25
20
15
10
5
0
MAX. TEMP.
MIN TEMP.
JAN
FEB
MAR
APR
MAY
JAN
JUL
AUG
SEPT
OCT
NOV
DEC
MONTHS

difference in temperatures. It starts from November till February and the average is about 5.6 knots per hour (i.e. about 2.88 meter per second). (See fig. 2.3).

The equotorial maritime air mass is characterised by south-westerly winds coming to the land of the Gulf of Guinea. These winds blow during the wet season and reach their peak at the beginning of the season (July-August). When the rainy season come to an end, they are from the south west with velocity averaging 7.3 knots per hour (i.e. 3.75 metres per second).

Since air movement past the body is required only during the humid season, it is that south-west wind which concern the designer. Roof over-hangs and projections are desirable in the inlet side of the building. This will retain useful air flow pattern and velocities in its room when it is oriented up to about 70^{o} from the wind direction.

2.4.3 Temperature

Temperature is generally higher during the dry season and ranges between $21^{o}c$ in December till $38^{o}c$ in February to April. During the rainy season temperature reaches its maximum in May and average about $35.5^{o}c$.

The mean minimum is 19.5°c while mean air temperature for every three hours daily is 25.9°c or 78.6°F fahrenheit. (See fig. 2.4)

2.4.4 Sunshine

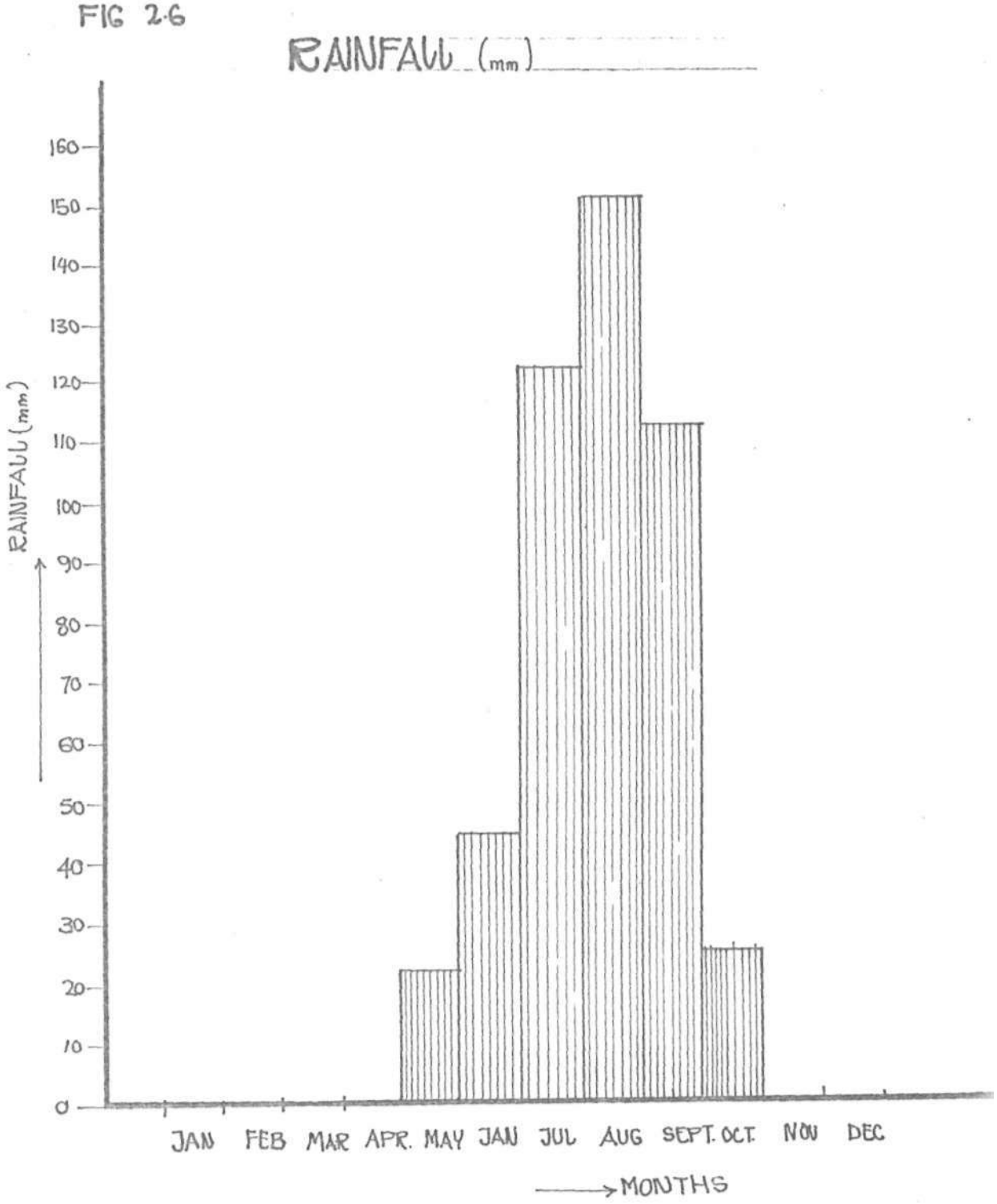
Records for the past ten years shows that during the rainy and hazy period, sunshine is less. Therefore, not much heat is felt but it becomes more intensive at middle of March to June as the sun's burn last for about 8 hours daily. (See fig. 2.5b)

2.4.5 Rainfall

Rainfall is geherally low here as the area fall within the Sudan Savannah. The rainy season is from May to October with a period of heavy pour between July-September which has an average of 197mm. The month of August has the heaviest average of 277.5mm.

The beginning of the dry season, November-December has nill average where as January to March, no rain is recorded, but the average in October alone is 11.6mm. The weight and the forces of the rain can drive water into walls if unprotected and penetrates it. The building

FIG 2.6


RAINFALL (mm)
RAINFALL (mm)
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
JAN
FEB
MAR
APR.
MAY
JAN
JUL
AUG
SEPT.
OCT.
NOV
DEC
MONTHS

components which are relevant to rain and need considerations are the roof; its slope and material. The finishing and treatment of the enternal wall. (See fig. 2.6).

2.4.6: Relative Humidity

Humidity is low during the dry season and reaches about 14% at 10p.m. in February and 39% at 7.00a.m. in the same month. The humidity is high during the rainy season. The mean annual minimum relative humidity is between 70 and 90 percent. Because of this low relative humidity for most part of the year, there are more days of clear sky. (See fig. 2.7).

2.4.7: Vegetation

The Northern part of the state lies within the Sudan zone. But its vegetation has been completely modified as a result of several centuries of human occupation featuring bush clearing and burning for cultivation as well as cattle grazing. The trees find include Acacia Albida, Jamarrindindica, tomarrida indica and butyrospermum parkii.

Apart from the non cultivated bush, grazing land, forest reserves. Farming activities take

FIG 2.5 SUNSHINE (HOURS)

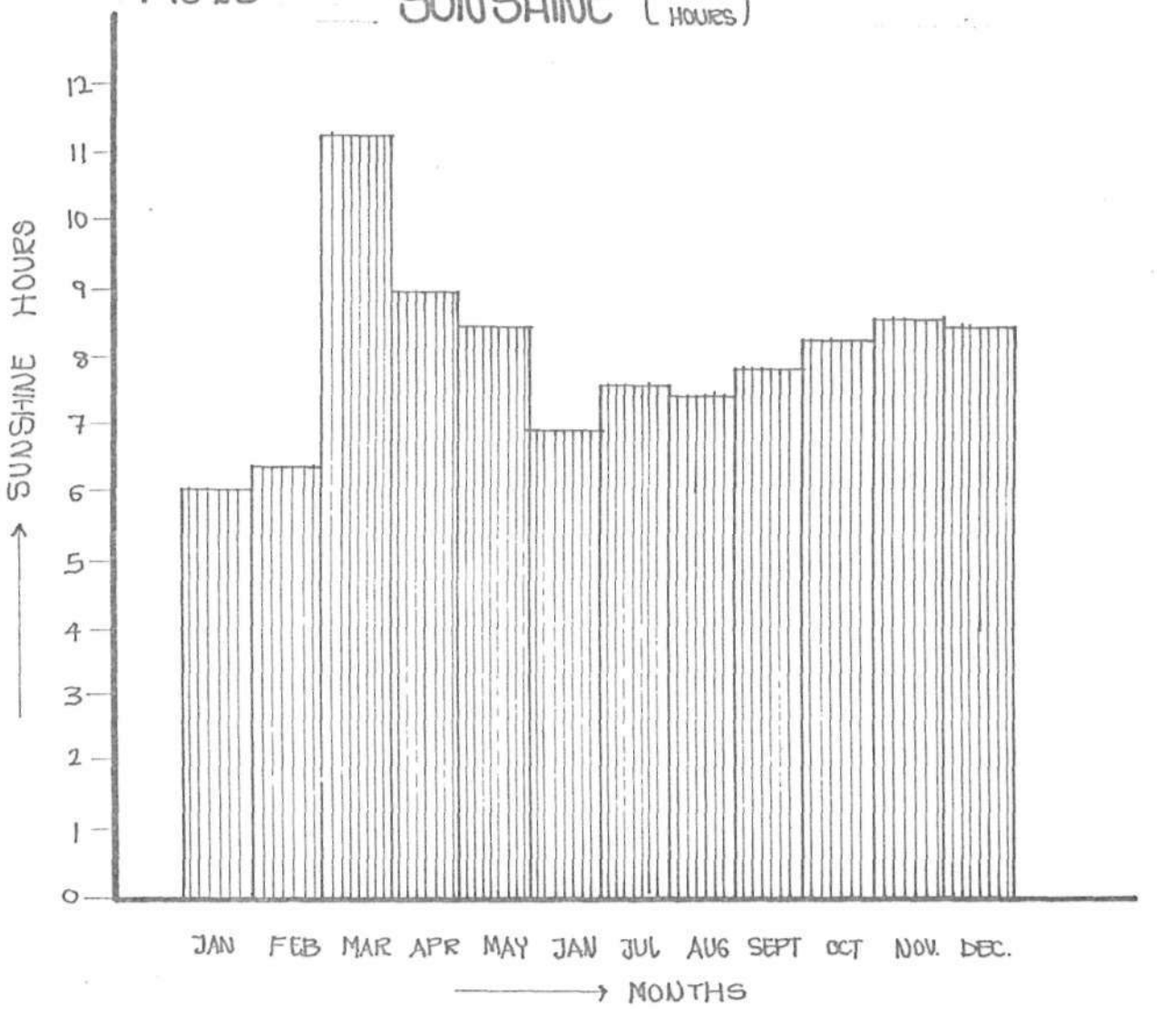
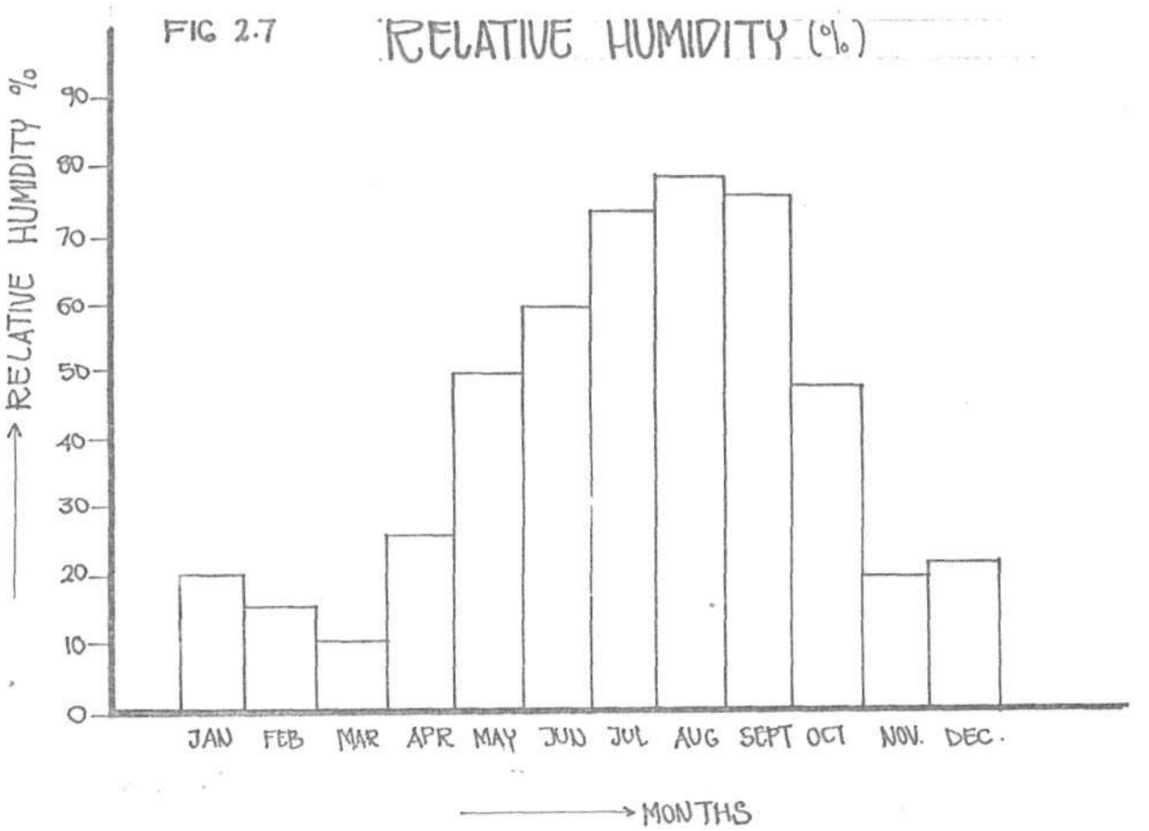


FIG 2.7 RELATIVE HUMIDITY (%)



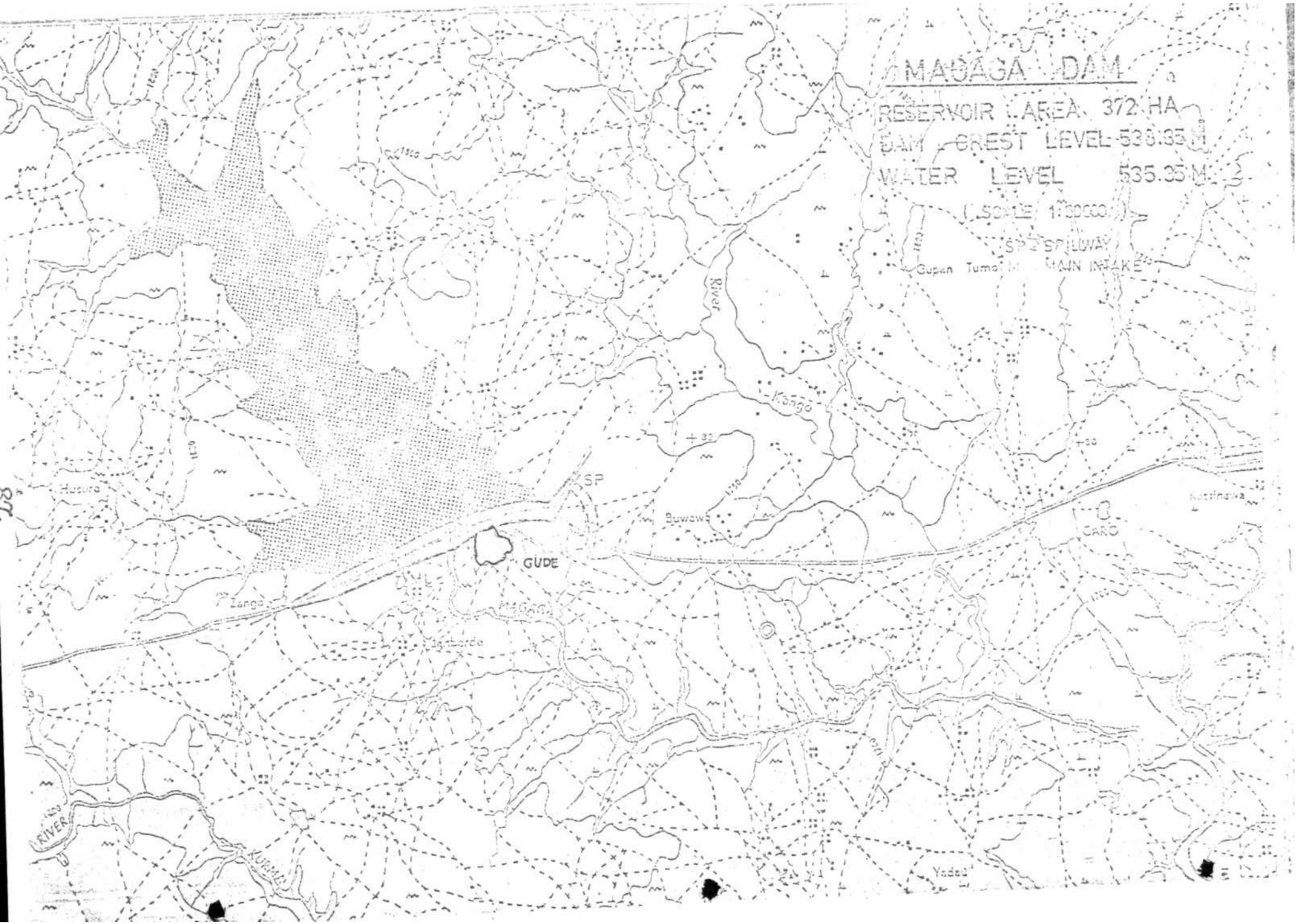
place in the upland and the fadama (cultivated low land farms along the water courses). Guinea corn and millet are the first crops. Groundnut is produced in the area not in large quantity as before.

2.4.8 Hydrology

The River Magaga and its tributary river Kango are the major rivers within the area. River Magaga flows across the area in a south-west direction where the dam has been built. The dam is opposite Gude settlement on which Kano-Gwarzo road served as part of the dam wall.

The dam has its full capacity of 19.68m^3 mil during the rainy season. Its maximum width and height is 14.7m and 19.35m respectively. The width of the base is 101.78m with surface area of 372 hectares. The total volume of fill is 713,000m^3. This caused health and flood hazard to the inhabitant as a result Kano state government decided to resettle them to a new propose site.

It has been established that the chemical and bacteriological contamination of the river is generally higher in the dry season. This due to an increase in the number of cattle concentration near the river (See fig. 2.8).


MAGAGA DAM
RESERVOIR AREA 372 HA
DAM CREST LEVEL 538.35 M
WATER LEVEL 535.35 M
SCALE 1:50000
SPILLWAY
MAIN INTAKE
Gupan Tumo
River
Kango
Buwawa
SP
GUDE
CARO
Nasilapwa
Hussuro
Zango
Magaga
Yadad
RIVER

2.4.9 Geology and Soil

The geology of the area is characterized by pre-cambrian basement complex rocks that out crop widely through out the area. They are mainly composed of gneiss and schist into which have been included the "older granites" forming the conspicuous inselbergs of the region. The gneiss is altered at the surface into red-laterite, varying from clay-sand-gravels to sandy clays, passing down through grey lateritic rock into the unaltered bedrocks at depths of 6 to 30 metres below the ground surface. Above the laterite, there appears to be a thin layer of consolidated dune sand.

The formation of laterite from gneiss and schist is caused by intense weathering under tropical conditions and involves the breakdown of field spars into various clay minerals.

2.4.10: Climatic Design Implication

In the composite climate of this area, it has been proved that neither traditional nor conventional methods of housing building is excellent.
This coupled with the fact that suitable building materials in the area are expensive or non available,

house design in Kano as a whole is complicated by apparently contradicting requirements. Large openings are required during hot humid period to facilitate cross-ventilation, while on the other hand, good performance during the dry season requires smaller openings and compact planning.

The following are recommendations for these features of build-mgs/houses that must be decided during the design process and which have great impact on either the failure or the success of these buildings/houses. They are grouped under the following subjects:

Lay out
Plan concept
Walls
Enternal openings
Roofs
Landscaping

(a) Lay out

Building should be oriented on an east-west axis with the long elevations facing North and South to reduce exposure to the sun. Buildings may be turned slightly to catch the prevailing breeze to allow limited solar heating during the colder season

(December - February). Also buildings should be planned around small courtyards. This give protection from sandstorms caused by harmattan winds. It also colls the micro climate by lowering ground temperature.

The courtyards minimise the impact of dust laden squalls that precede rain. Both the nuisance of dust before a storm and the strength of the driving rain during it are lessened by the high external solid walls enclosing the court yard. The provision of court yard is essential for private out door sleeping during the dry-season.

(b) Planning Concept

The houses should be deeper. The mutual crowding of units and built walls provide-shading and reduces the area exposed to the sun. Also increasing the mass of the whole building group thus increasing the time lag. Room should have windows facing opposite side especially where the breeze blows from to maximize air movement passing the body from one side to another. This essential from May-October when humidity level is above the optimum comfortable value.

(c) Walls

External and internal walls should be heavy with high heat capacity (8 hours lag is required). This performance may be obtained from 30cm latterite block.

(d) Openings in Walls

Small openings between 15 percent and 25 percent of the wall area should be used. The increase of solid wall is needed for thermal storage during the hot dry season. 0 Large areas of glass should be avoided and opaque materials such as flat absestos cement sheets can be used for openable areas.

(e) Roofs

The roof of a building has the greatest exposure to rain and sun. Considerable slope helps in taking out rain water while the choice of durable roofing materials would be another important objective. The other objective is to reduce heat penetration into the interior, and dispense any accumulation of day heat to prevent further radiation on sleeping rooms at night.

For this reason, heavy roofs are recommended and the roof should be provided with time lag of about 8 hours. This could only be achieving by using mud roofing system.

REFERENCES

1. Based on revision upwards to correspond with the beginning of the Calendar year. Reference Kano State Statistical Year book, 1981.

2. Interview with Hausa elders of Gude Dec. 1991.

3. John Turner and R. Fichter, Freedom to build macmillan.

4. Lesser Sallah and Big Sallah

5. Paul O.E. (1972) Shelter in Africa Praeger London.

CHAPTER THREE

CASE STUDIES OF RESETTLEMENT SCHEMES

Different types of resettlement schemes have been carried out in Nigeria, Africa and other countries of the world. Each scheme has its causes and problems. The number of people involved and the methods of resettlement vary from one scheme to another. Likewise, the degree of success and failures also differ.

The main aim of this study is to fish out the merits and de-merits of each scheme and conclude on what has to be grasped and what ought not be grasp from them. This is with a view to avoid ending up in the same pit fall.

Particular attention will be given to the design of house types, the planning, financial implication and the provision of facilities and amenities. Also the materials and construction techniques will be looked at. The number of people involved in various schemes and their raction towards the scheme will also be considered.

3.1 Brief History of Resettlement Scheme

In all the resettlement schemes carried out in Africa, the basic objective of the authorities was to acquire the lands on which the people were living

originally for national development and relocate them on new lands. However other objectives are crept in. These were innovations of economic and/or social nature. Certain innovative changes therefore appear to be basic or primary while others are secondary. The basic ones are common to all resettlement exercises and appear to be unavoidable. The secondary ones on the other hand appear to be developement oriented thereby taking place only when necessary.

The primary ones include:-

i. New geographical sites
ii. New houses/land use/neighbours
iii. New source of water supply
iv. New public utilities like roads, schools and health care centres.

The secondary ones include:-

i. Emergency food relief programmes (where necessary)
ii. New economic activities such as construction work requiring unskilled labour.
iii. Modern institutional arrangements for traditional occupations like co-operatives, irrigation plants and mechanized agriculture.
iv. New socio-economic standards of living and political indoctrination (where necessary)
v. New administrative structures.

Some of the secondary innovations in particular are often used to induce co-operation and are usually preferred over government coercion. They are considered developmental and easy baits for the affected people.

Due to the fact that national interests are considered first before the welfare of these to be resettled most of those innovations were not varourably received and situating them arose negotiation protests and some times, outright rejection.

In some cases such towns protest were violent enough to result in death or changes of political administration personnel. Therefore, the success in relocating the people in each case basically sterms from the political power which the resettlement authorities have in the exercise.

3.2 Tema Manheen Ghana

3.2.1 Introduction

The Tema resettlement began in 1969, when the government of Ghana decided to build a second habour in the country. [1]The resettlement of 12,000 people living in the old Tema fishing village (which fell partly in the area of the Town centre and partly in the harbour area) at a place 4.83km away.
The reharsing of the people in a modern village

involved more than a mere uprooting of 12,000 people together with the transplanting of over 200 communal and family goods. The whole project was a daring and unique experiment in resettlement. It was a bold but carefully planned administrative and sociological operation of adjustment and rehabilitation which posed enormous political, social and administrative problems.

The old Tema fishing village was situated between two lagoons, the Sakumo on the east and Chemu on the west, and tradition has it that they have settled since about the fifteenth century. They have been sheltered from the their traditional enemy by the project arms of the two lagoons. It was all their lands thus rendering them landless (See plate 3.2)

3.2.2 Resettlement Policy

The resettlement policy of the government in 1952 was that all people staying in the rent-free accommodation in Tema would be rehoused in new dwellings. As far as possible the government discourage pepole from accepting cash compensation. Only two people were paid cash compensation and it was so small that in itself was discouragement to many people.

PLATE 3·1



Figure 5 Plan of Old Tema

PLATE 3·2



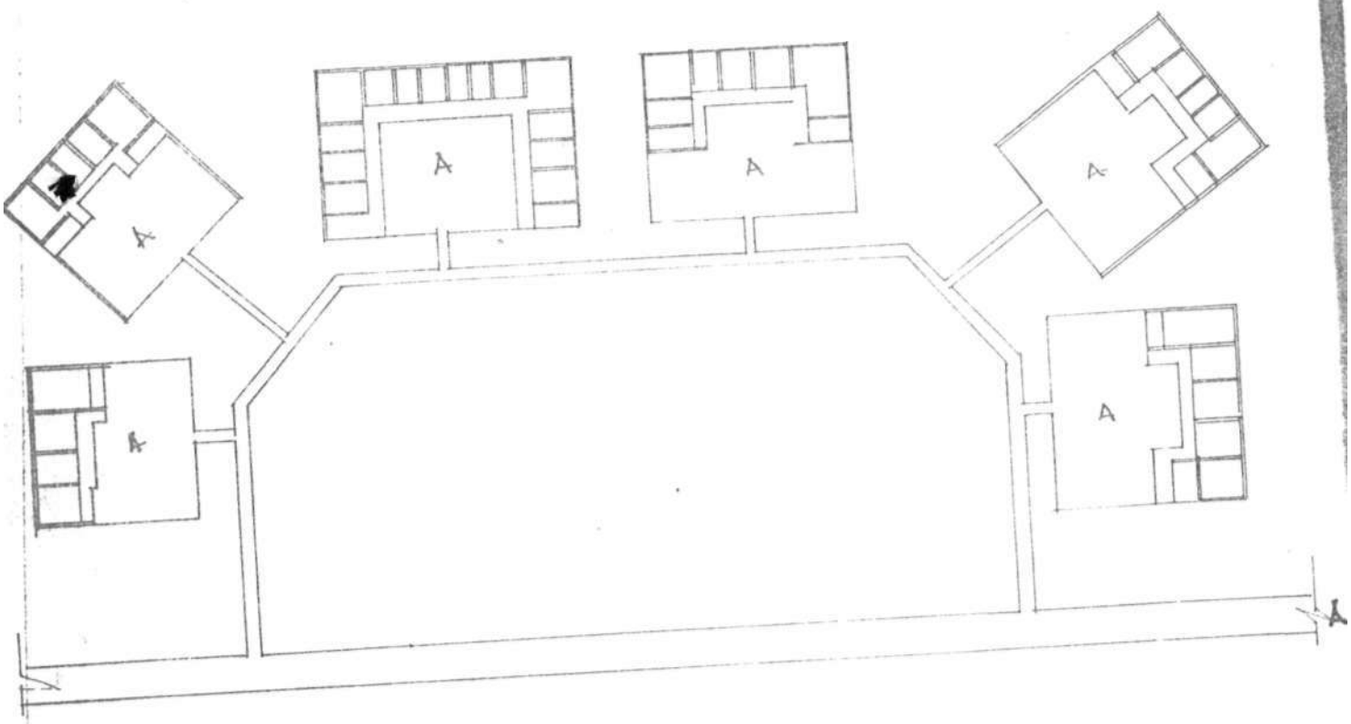
A. LAYOUTS OLD AND NEW TEMA.

The basic resettlement policy was to build another village 3.22 km east of old Tema which would enable the people to continue to live as fishermen, farmers and fishmongers. Retaining their traditional organisation by quarters and other social values. At the same time, it was envisaged that better houses would be provided for the people, while each house owner would receive the same number of rooms as they had before. Four hundred and four houses were planned with 2,502 rooms to house the four quarters of Awudung, Aboitsewe, Ablewonkor and Ashaimang.Later, it was discovered that many Tema people would have to be accommodated,and for this purpose a further 100 Ten room limits were built in what is called extension area. Later, still 29 long eight-room zinc huts had to be built to accommodate more people called zinc huts area (See figure 3.1&3.2)

3.2.3 The Proposal

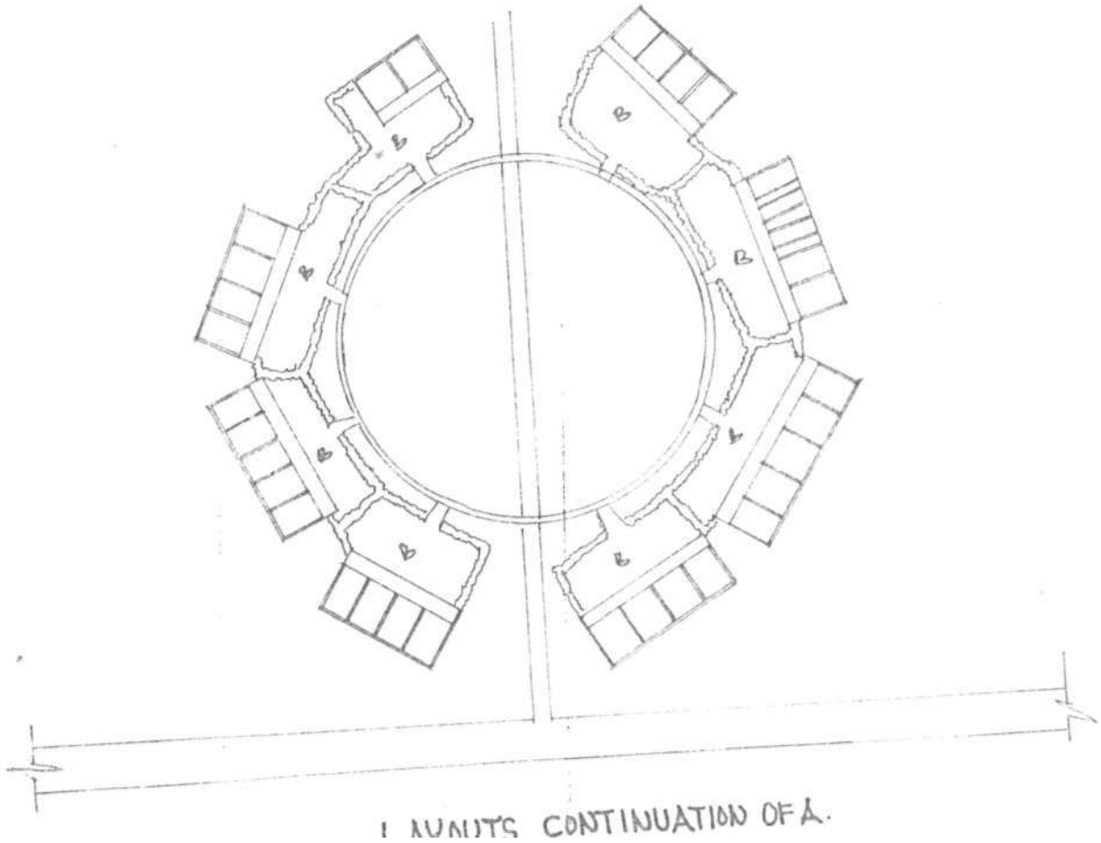
A layout was prepared with large housing units split up into individual compounds, with large and small houses built around communal open spaces called major compounds. The village was resited along the crest of the ridge running inland east of Chemu lagoon, farming a tail to the light house which stood on the highest point at the seaward end.

FIGURE 3·1



LAYOUTS

FIGURE 3·2



LAYOUTS CONTINUATION OF A.

A small proportion of the houses at Awudung were now sited close to the sea. A belt of trees to the south-west would screen the village from the proposed oil storage area.

Access to north and south sections of the village from the through road is provided by primary and secondary laterite services roads. Because of successive amendments in the plan the ward boundaries became arbitrary except for Awudung which lies between the through road and the sea. Sites were allotted to elder's meeting house's which serve as focal points for each ward (See figure 3.3)

3.3 Kainji Resettlement Scheme

3.3.1 Brief History

This resettlement scheme was as a result of the damming of river Niger around Bussa and Yauri in the emirates of Borgu and Yauri in Kwara and the former North Western states respectively. This brought about the movement of 44,000 people together with their house hold belongings and domestic animals. Of the 44,000 people displaced 10,688 are males, 13,005 are females and 20,306 are children.

Infact this population were evacuated from 203 villages and hamlets and 2(two) towns. And were

eventually resettled in 139 new villages and hamlets and two new towns namely, New Bussa and New Yelwa 'See plate 3.3)

3.3.2 Resettlement Philosophy

As a result of the urgency involved in the scheme, the authority involved did not care to bring out some objectives of the scheme. Villages and hamlets were not merged to form greater and economically more viable communities. Moreover, in the new siting, no attempt was made to evolve settlement pattern that would make the provision of amenities cheaper and more meaningful. Infact, the main pre-occupation of the authorities concerned was the evacuation of the people before the area was flooded.

3.3.3 Housing Policy

The housing policy was such that the authorities provided houses on a room to room basis. In all 4,320 houses made up to 27,642 rooms were replaced for the same number that have been flooded (see fig. 3.4 and fig. 3.5) Also the same hierarchy of settlements that existed in the flooded area were re-provided viz: Urban, semi-urban, rural and semi rural (see plate 3.4). With the exception of the choice of site in which the people participated, the design and planning of the houses were solely handled by a firm of Architects.

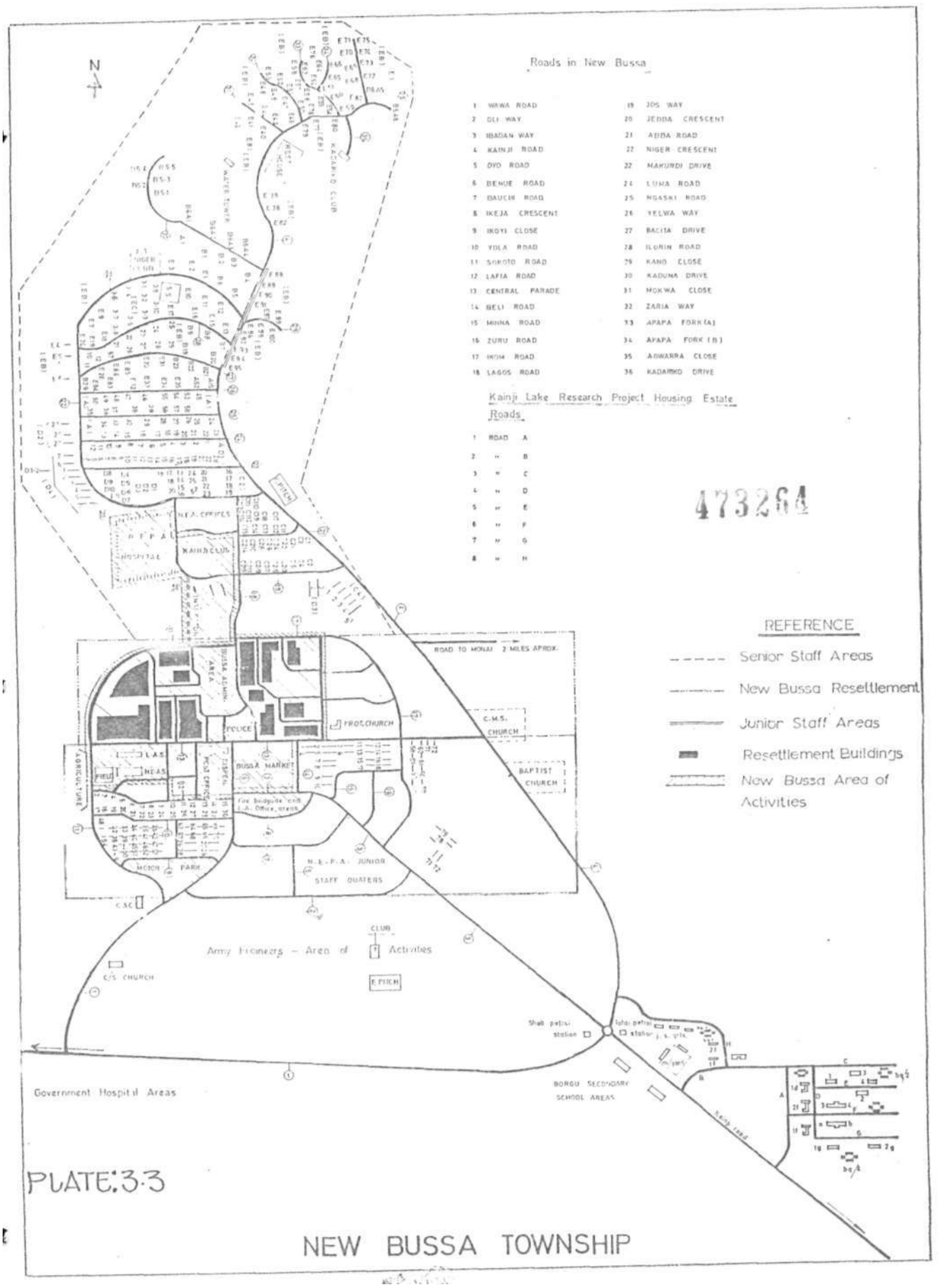


PLATE: 3·3

NEW BUSSA TOWNSHIP

SEMI RURAL HOUSE TYPE

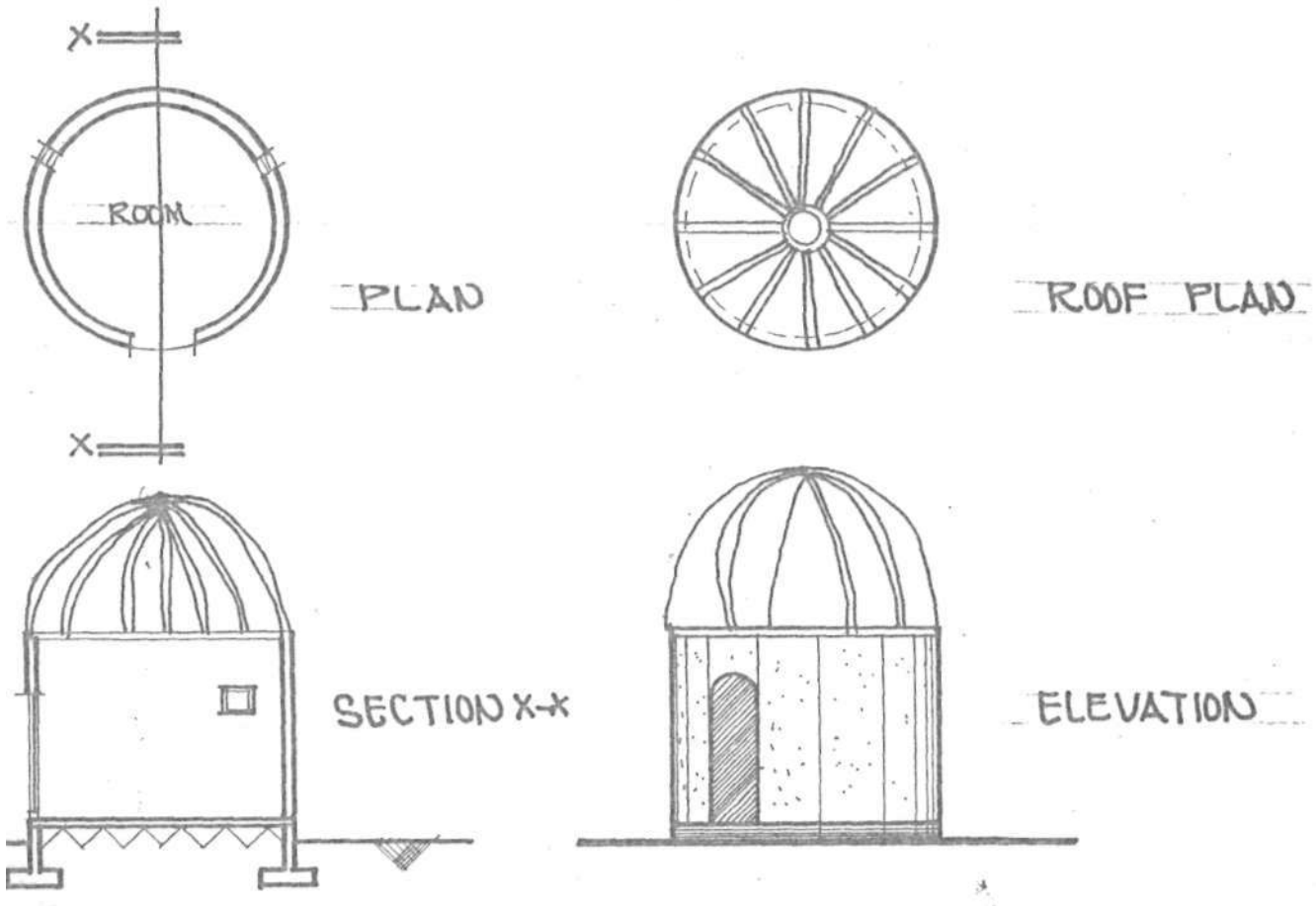
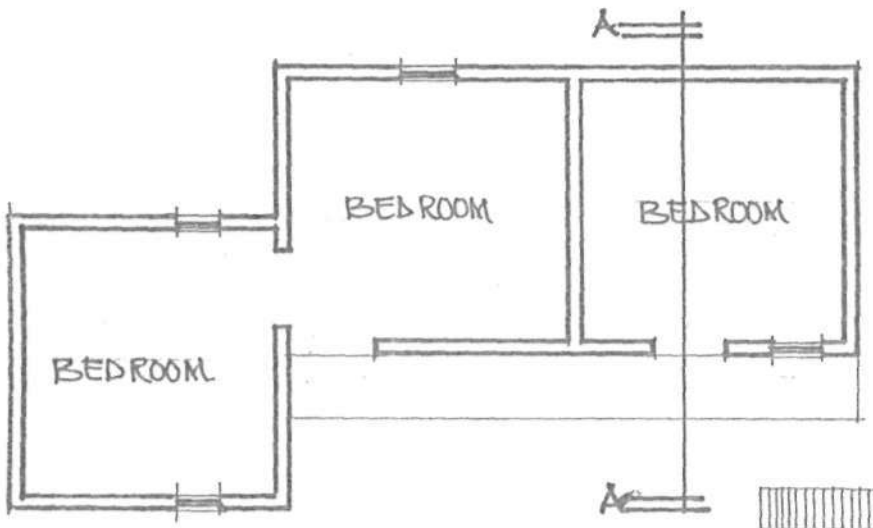


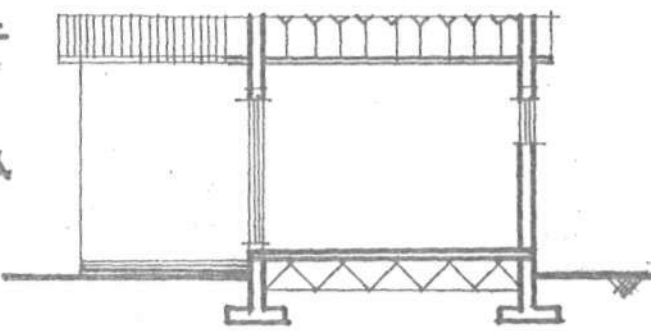
FIG. 3·4

HOUSING UNIT FOR KAINJI RESETTLEMENT SCHEME.

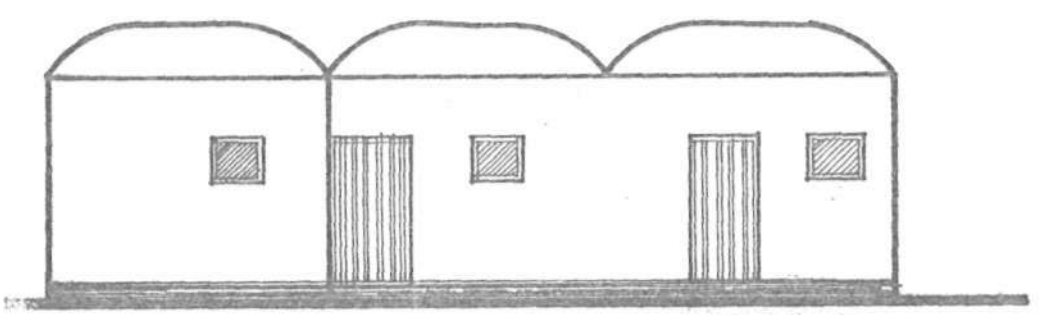
SEMI URBAN TYPE



FLOOR PLAN



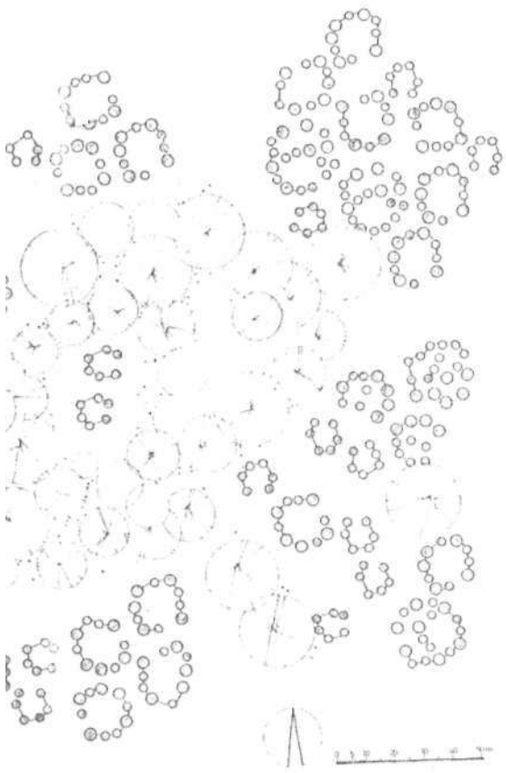
SECTION A-A



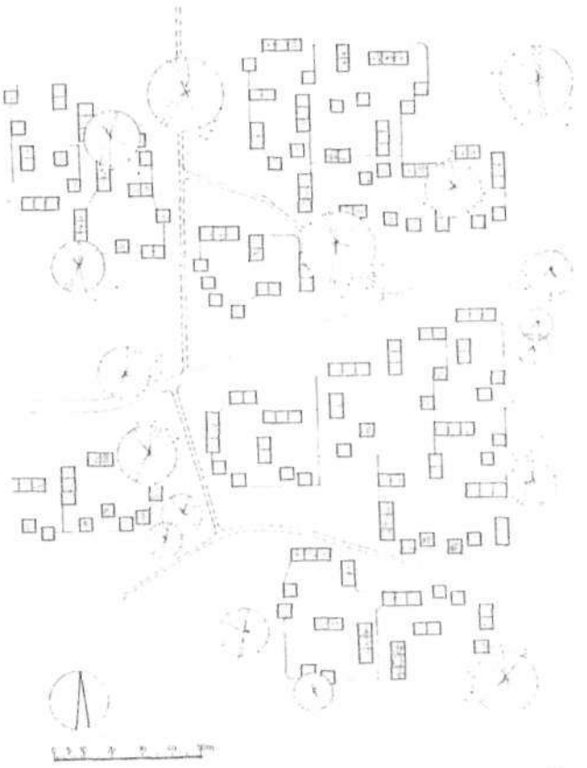
ELEVATION

FIG. 35

HOUSING UNIT FOR KAINJI RESETTLEMENT SCHEME.

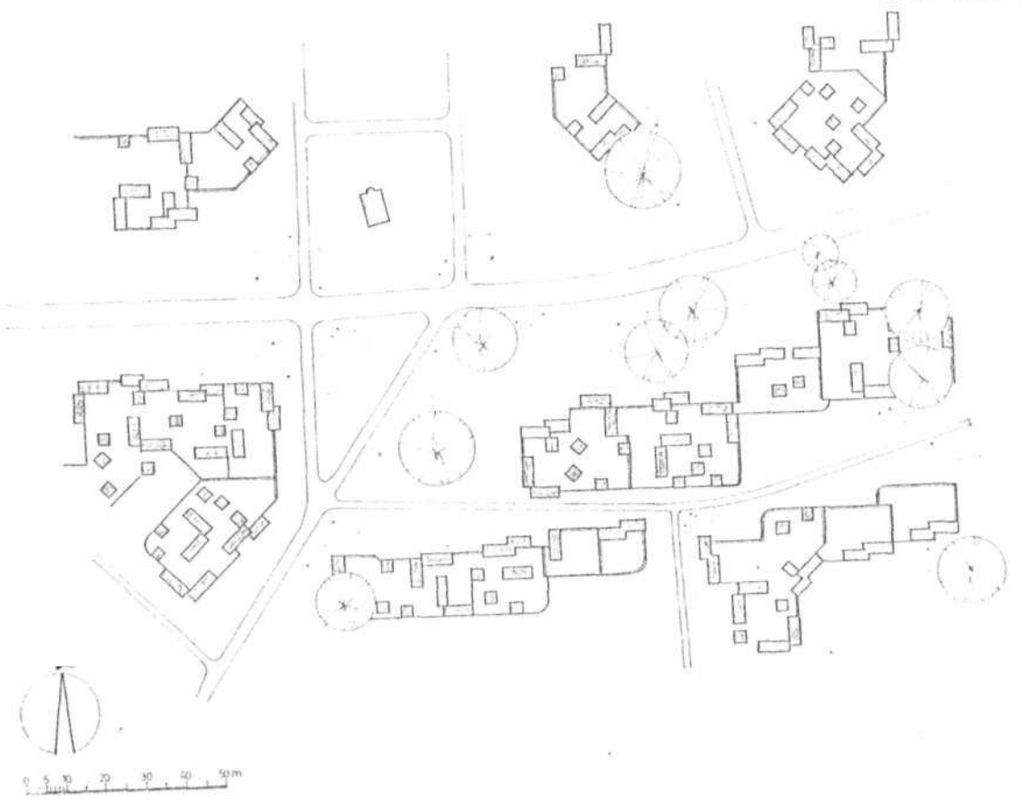


1: schematic grouping of rural dwellings



Amboshidi: site plan of semi-rural village

Urban housing type C



This has presented a lot of problem to the people as some settlers have complained that the new rooms are much hotter than their original building. Others have modified some of the houses by erecting shades, building and walls as partitions and blocking some windows or reducing some door heights. Nevertheless, the houses were acceptable to the people because the forms and layout conformed with their traditional standards.

3.3.4 Amenities and Facilities

Some new amenities and facilities were provided in the new scheme. They includ2 2 town halls, 6 village halls, 1 water treatment plant, 195 wells for water, 16 markets, 142 shops, 43 mosque, 3 corn grinding slabs, 3 sloughter slabs, 3 schools, 3 veterinary clinics and 2 dispensaries.

These facilities were provided on a replacement bases. That is a school for a school, a well for a well kind of things. Therefore the need to improve the conditions of living and the general rural habitat was not taken into consideration.

3.3.5 Materials of Construction

The authorities concerned made little or no effort to look into the available local materials like grass, mud, bamboo etc. so as to even use them in an improved form for construction. Infact, most of the new buildings were made of sandcrete walls and absestos roofs. The use of these materials made the house technically out of control to the occupants.

In the urban areas, canal asbestos were used, while in the rural areas some dome-prefabricated absestos roofs were used as an imitation of the traditional conical thatch foof. The failure of the scheme could therefore be attributed to the use of expensive imported materials, technology and skills which helped in no small measure to increase the total cost of the project.

3.3.6 Financial Implication

The financial aspect of the project was handled by a Federal Government Agency (The Niger Dam Authority). The total cost of the project was ₦21.4 million. Infact housing alone cost ₦12000 million. Thus, the per-capital cost for the resettlement of 44,000 people was ₦490,00 per person

3.3.7 Observations

Some of the successes of the Kainji resettlement scheme are as follows:

a. The layouts of the new settlements were in conformity with the traditional requirements of the people.

b. The initial preparations for the site selection, soil and demographic survey were detailed.

c. The nsed of cylindrical walls and conical roofs, made the room look like Kambari traditional Architecture.

d. Precast concrete openings resembling those of similar local mud form and colour cement rendering on the wall - laterite colour identifying the housing scheme, With the surrounding.

e. The manner of regrouping of the numerous small villages into a smaller number of villages without disrupting the pattern of traditional hierarchy of settlement viz: semi-urban, urban, semi-rural and rural.

f. The collaboration and participation of traditional rulers in the publicity and enlightenment campaign contributed a lot for the success of the scheme.

3.3.8 Failures

Some of the failures of the resettlement are as follows:

i. There was no attempt in the use of tradition local building materials in which the people are used to.

ii. Modifications made to the houses by most occupants really indicates the failure of the Architect in satisfying the socio-cultural needs of the people.

iii. There was a general complaint by the people of the houses being too hot and less comfortable.

3.4 Ushafa Resettlement Scheme

3.4.1 Brief History:

The construction of lower Usman Dan Abuja lead to the displacement of three villages namely Jigo, Pari and Kwabara. The people displaced were Gwari by tribe and rural farmers in occupations. They were to be resettled since 1981 but due to the politics involved, they were neglected not until the coming of the Military in 1983. The total population of the people in the three (3) village was 1,130.

3.4.2 Resettlement Philosophy

Because of the urgency involved in the project, the F.C.D.A. which was responsible for the resettlement of the people displaced did not evolved any objectives for the project. The task before them was just to move the people to the new settlement and that was all (see plate 3.5).

3.4.3 Housing Policy

The F.C.D.A. designed the houses on a room to room basis. No plan for future development was considered. However, the form and concept of the new houses was okay, but the extended family nature of the compound was completely neglected. There was no popular participation of the people in the design and construction and construction of the houses. The design was handled by a single Architect. The buildings materials used were bricks, timber and aluminium sheets. The choice of materials was highly commendable. Hence it went a long way in reducing the cost of the entire project (See fig. 3.6) for housing unit design.

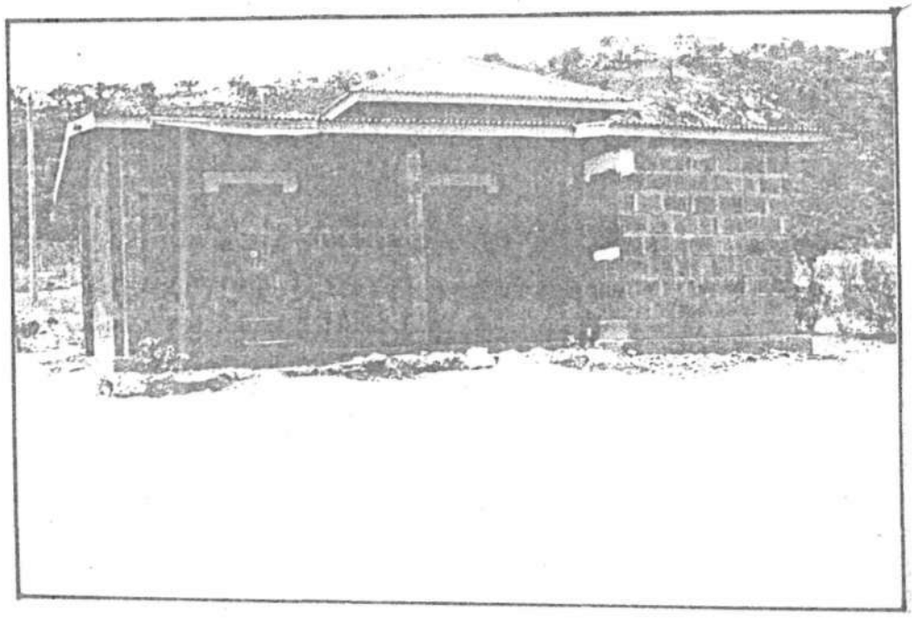


PLATE:35

REAR ELEVATION OF A UNIT HOUSE.

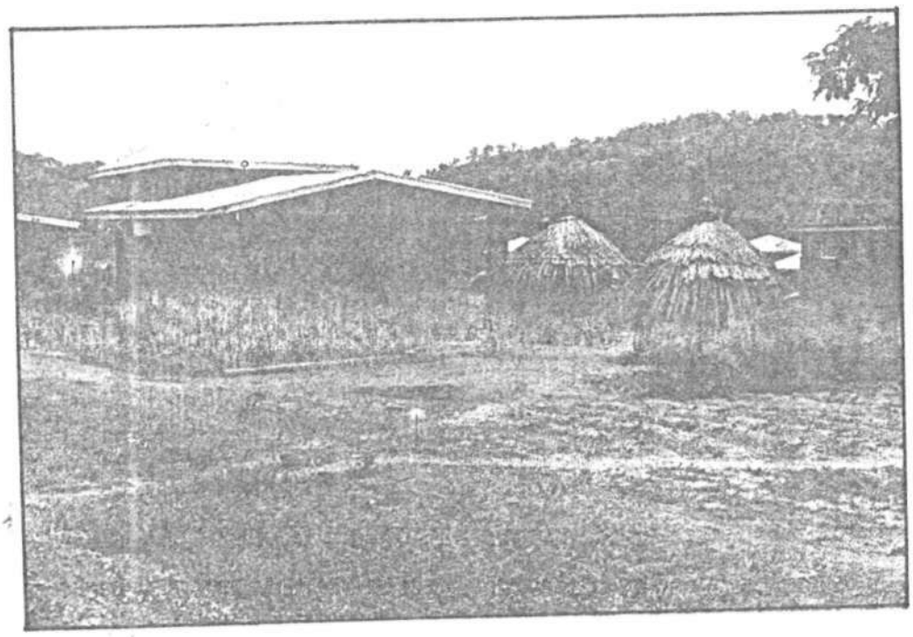
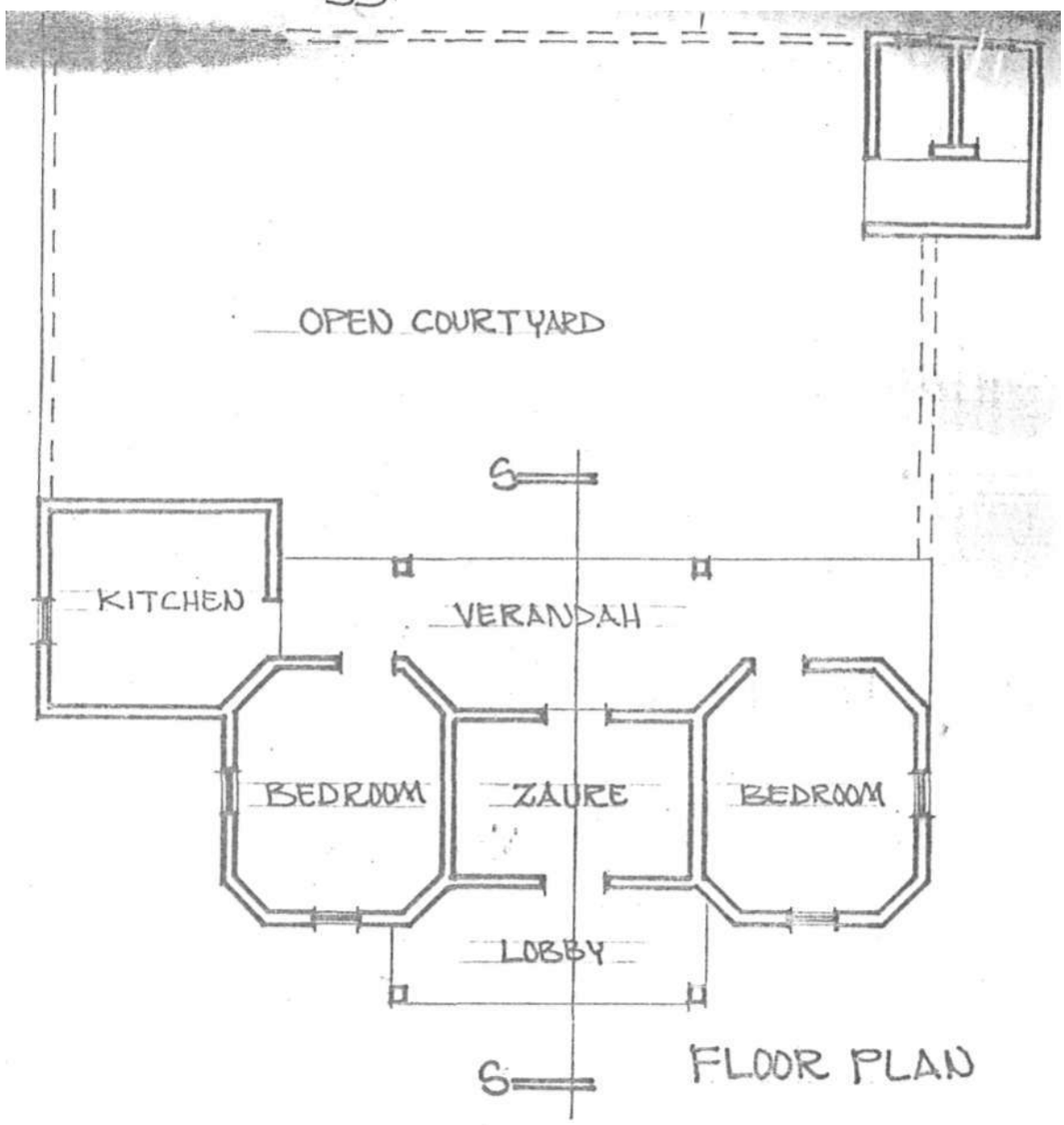


PLATE:3·6

ADDITIONAL BUILDINGS WITHIN A UNIT HOUSE.



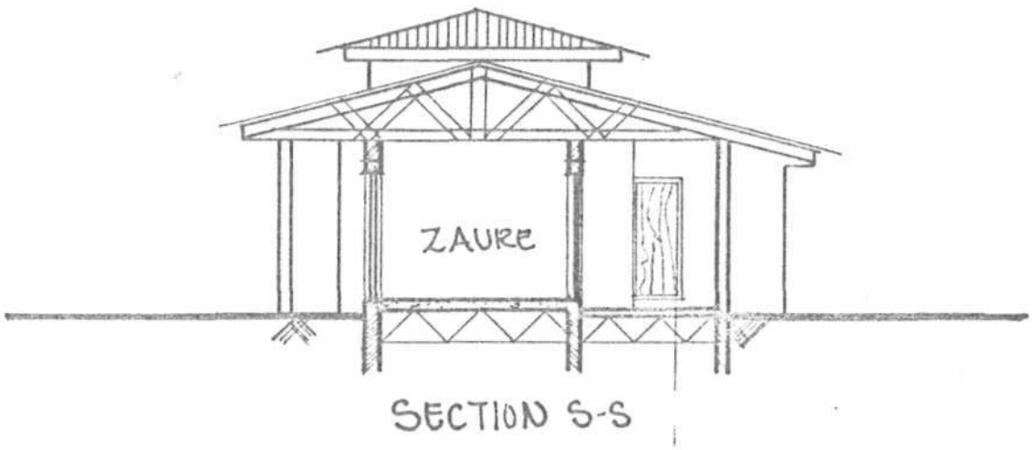
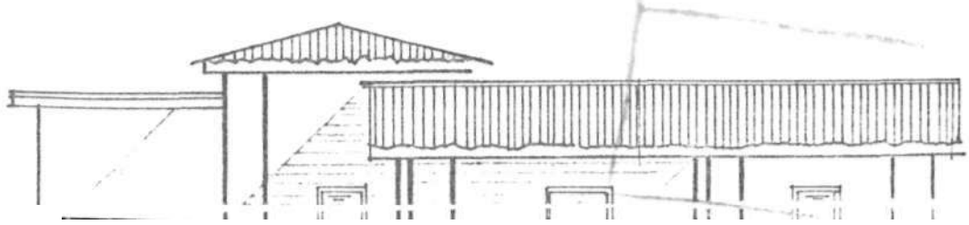


FIG 3·6 USHAFA HOUSING UNIT



3.4.4 Amenities and Facilities

The new amenities provided for the people in the new settlement area: 1 clinic, 1 market, 1 primary school, a church and mosque (see plate 3.7 & 3.8). However, it is interesting to note that the displaced people had no such social amenities in their old settlements.

3.4.5 Observations

a. There was a popular participation of the people in the selection of site for their new settlement.

b. The communal facilities are centrally located to form a focus of the settlement.

c. The house type constructed has the traditional zaure at the entrance. And the toilets and bathrooms are located at the backyard which is in conformity with the people'scustom.

3.5 General Observation and Recommendation

From the analysis of the above case studies of rural housing, it is pertinent to mention here that a through study of the socio-cultural and economic activities of the people concerned is necessary prelude to a successful design work of a resettlement scheme. Because, if you push families into rows of identical houses then something in those

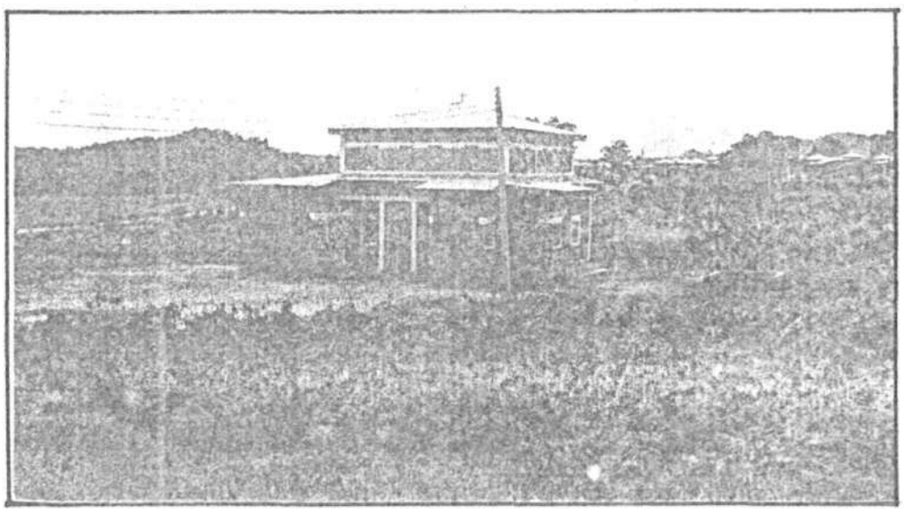


PLATE:3·7

VILLAGE CHURCH.

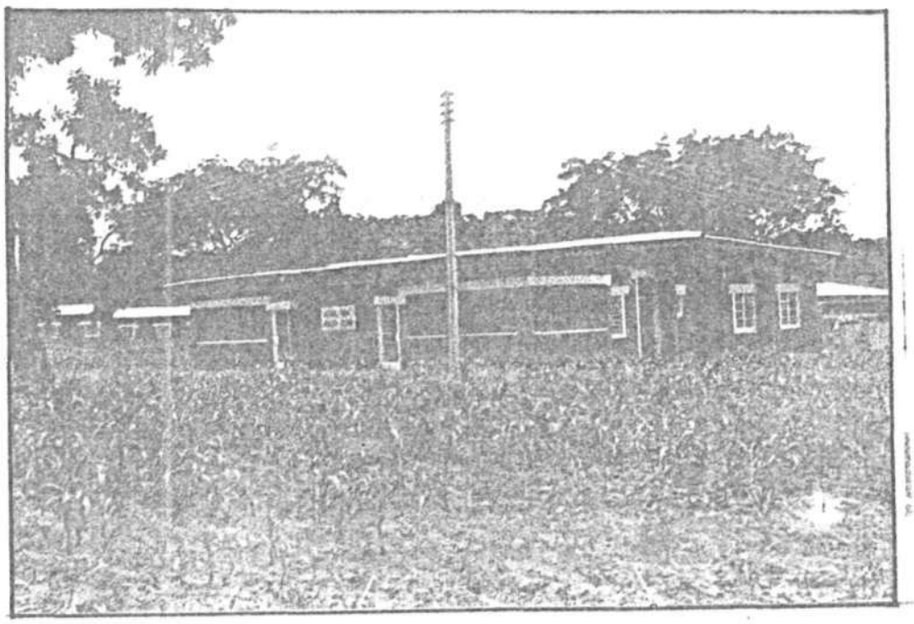


PLATE:3·8

USHAFA HEALTH CLINIC

families will die, especially if they are poor. The people will grow dull and dispirited like their houses and their imagination will shrivel.

This scheme, a resettlement of Gude community in an agricultural village is a hypothetical experiment in "agricultural revolution". This might boost the state and nations agricultural exports. It will also earn foreign exchange to help revamp the present ailing economy problems of the country. It also tries to help solve the social problems of the displaced people.

3.6 Housing Case Studies

In order to arrive at a comprehensive and acceptable design for the people, there is a need to thoroughly understand their traditional architecture.

For this reason case studies were conducted on the existing dwelling units so as to establish functional relationships, forms and materials used. Houses were choosen at random from various wards within the village. During the analysis two basic types of houses are identified in the study area in relation to family structure.

1. The single house hold house
2. Multiple household or compound house which can further be divided into two.
   a. Simple compound house (reflecting composite family unit structure)
   b. Complex compound house (a reflection of collection of family structure unit)

The House

No. 1) Simple single family house

Location: Kofar Kudu

The compound head is Mallam Sule Adamu, has a wife with four children. He occupies a bedroom with his wife and their baby son. The children occupy the circular hut. Infront of compound head's room is a foofed - cemented outdoor sleeping area.

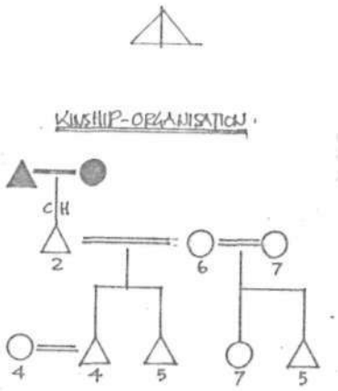
The house consists of rectangular rooms except the children's circular hut. The zaure which is the only access to the house open into a big coutryard enclosed in a mud fence. In the courtyard are well close to the kitchen two animal sheds and outdoor cooking space. At the right corner of the fence is a latrine and bath area surrounded by (zama) fence (see fig. 3.6).

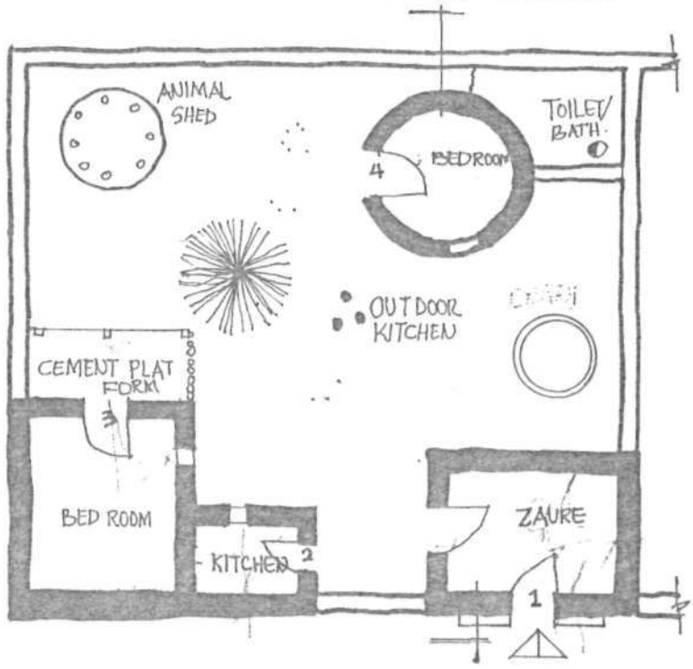
PRIMARY NUCLEAR

PLAN No 1

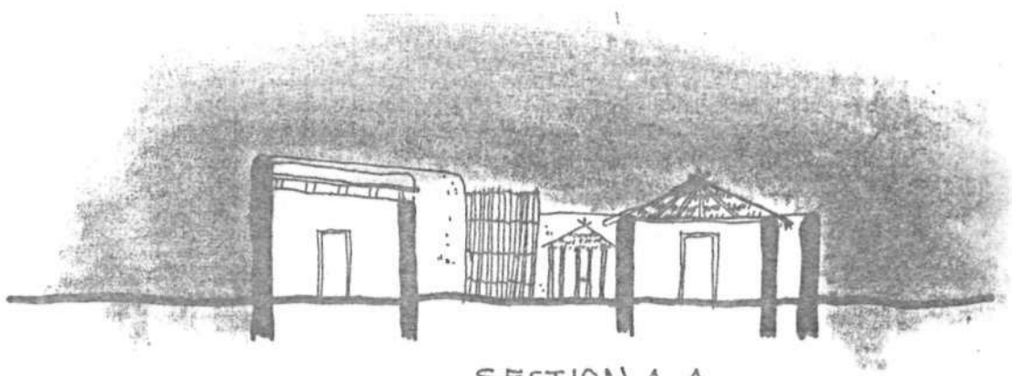
MALLAM SULE ADAMU'S HOUSE
LOCATION – KOFAR KUDU.

KINSHIP-ORGANISATION

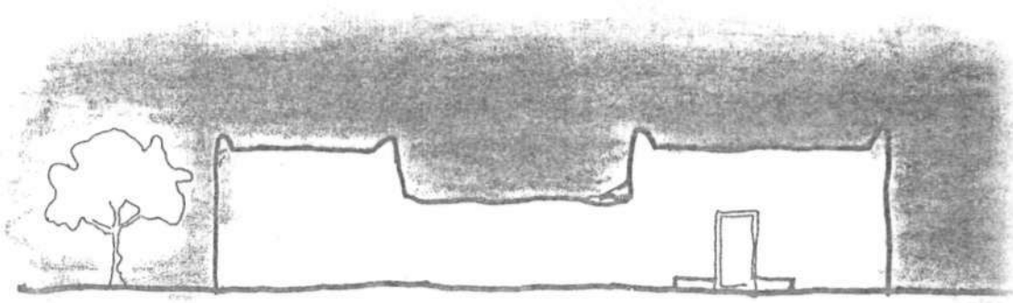




PLAN



SECTION A-A



FRONT ELEVATION

Plan No. 2

Location: Kofar Gabas

The compound head is Mallam Magaji Adamu, bas a wife with two children. He has a room for himself and the wife shared her room with children.

The house is a large fenced land that has provision for an organic growth into the compound house type. From outside, the house has two "Zaure" shigifa with an intermittent fire court ("dan saran") between the second and the shigifa. It has a guest or boys room in which the aged mother of house head live, a large court yard and two rooms on one side, a shared well with a neighbouring house, a latrine and an animal shed on one side. (See fig. 3.7).

Plan No. 3:

Location: Kofar Yamma

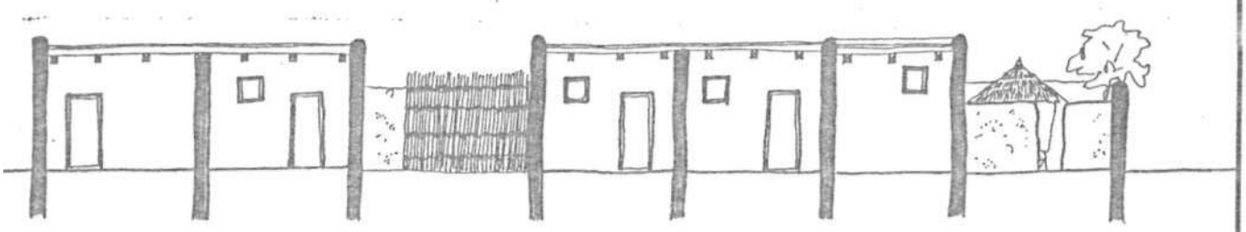
The name of the compound head is Alhaji Hamza Musa, with his brother inherited it from his late father. The house consits of 3 bedrooms, a circular hut, a zaure and still attached to one of the bedrooms but opened outside. There is a large court-yard with a granany, trees, chicken pen, animal shed, a well, outdoor latreen and at the extreme left corner a place for drying purposes.

PLAN No. 3

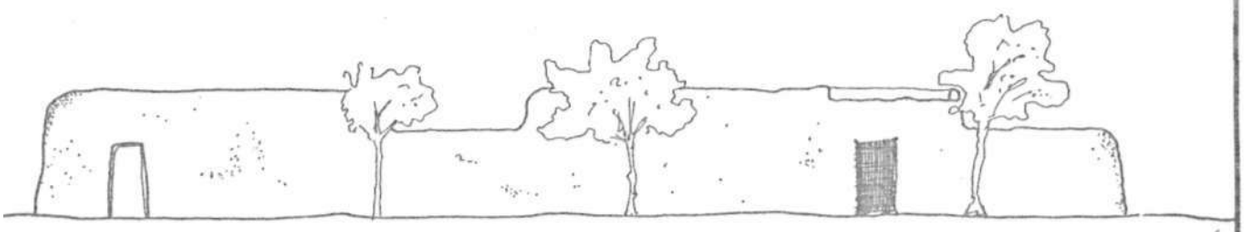
ALHAJI HAMZA MUSA
LOCATION: KOFAR YAMMA



PLAN
SC. 1:200



SECTION A-A



FRONT ELEVATION.

• DIRWAN TIGA - A 4 BEDROOM TRADITIONAL HOUSE

SCALE 1:100

The household head has two wives and 3 children, two boys and a girl. He occupies a room next to the zaure. Each wife has own room which also accommodates her small children. The senior wife has two boys while the younger one has one girl. The household's mother occupies the circular hut. The brother live outside the house (See fig. 3.8)

Plan No. 4

Location: Unguwar Mahautar.

The house belong to Mudi Dadu, has a wife with 3 children, one boy and two girls.

The house is fenced with mud wall, consist of two bedrooms and living room, a latrine, kitchen, zaure and store attached to the zaure with large court yard. (See fig. 3.9).

Observations :

It is here observed that the houses are solely built of mud with walls of 30cm-40cm thick and mud roofs. All the kitchens and latrines are opened and in most houses.they shared courtyard with animals which is unhygienic. This will be taking care of when making proposal. Apart from that all the houses have open court-yards which are sheded in most houses.

II Multi household

Plan No. 5 - Simple Compound house

Location: Kofar Yamma

The household head name is Salla'u Yesi and has 2 wives with 4 children. Three boys and a girl out of which the eldest son is married and stayed with his parent. Each wife has a room which also accommodates her small children. The compound head occupies a room next to the "Zaure" so that he checks movements in and out of the house.

The house and it's shaded courtyard enclosed by mud wall is rather simple both inform and material of construction. All the rooms are rectangular in shape including the "Zaure" and kitchen except the animal shed which is circular. The court yard is large enough to accommodate out door cooking space a tree, granany and fire wood kept under the tree. At one corner of fence wall is an open pit latrine and bath area.

Plan No. 6

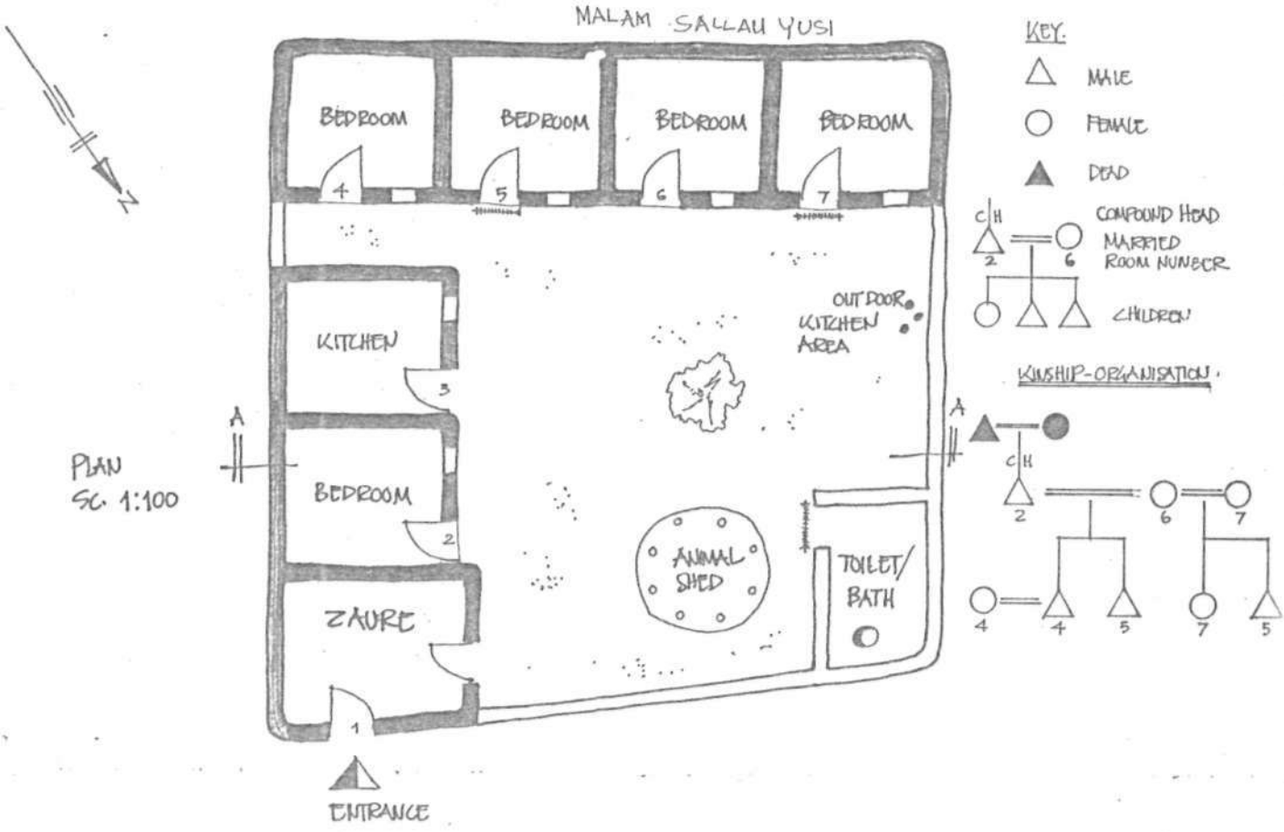
Simple compount house (primary extended family)

Location: Kofar Kudu:

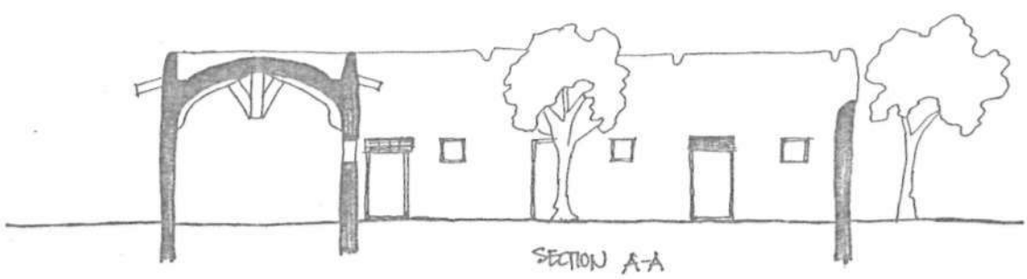
This is a simple compound belonging to two brothers namely Maikudu Yaya and Inuwa Yoya each heading a household. The two houses shared entrance hall,the house to the right has two rooms, a granary,

5- BEDROOM TRADITIONAL HOUSE

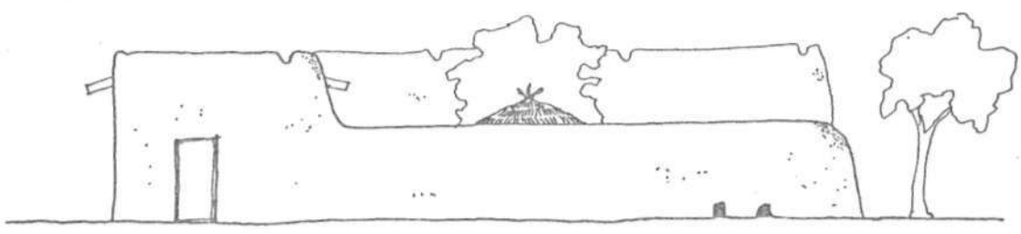
MALAM SALLAU YUSI



PLAN
SC. 1:100



SECTION A-A



FRONT ELEVATION

a court yard, an animal shed, a latrine. Going to the shared entrance hall from the courtyard is an inner zaure in which the wife prepares and cook food, attached to this is an open yard with water well then the Zaure next to the next entrance hall.

The other house has and inner "zaure" for where cooking takes place, a courtyard and animal shed a latrine, a well and three rooms (See fig. 3.10).

Plan No. 7

Simple compound house (primary extended family)
Location: Kofar Gabas

The house belongs to Mallam Musa Abdu with a total family of twelve people. This consist of the compound head, his two wives and their five children. The eldest son is married and has three children (See fig. 3.11).

Plan No. 8

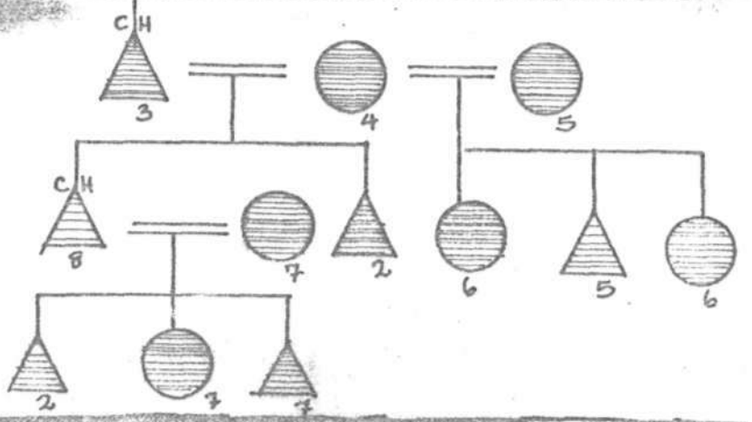
Simple compound house (Primary extended family)
Location: Unguwar Nahauta.

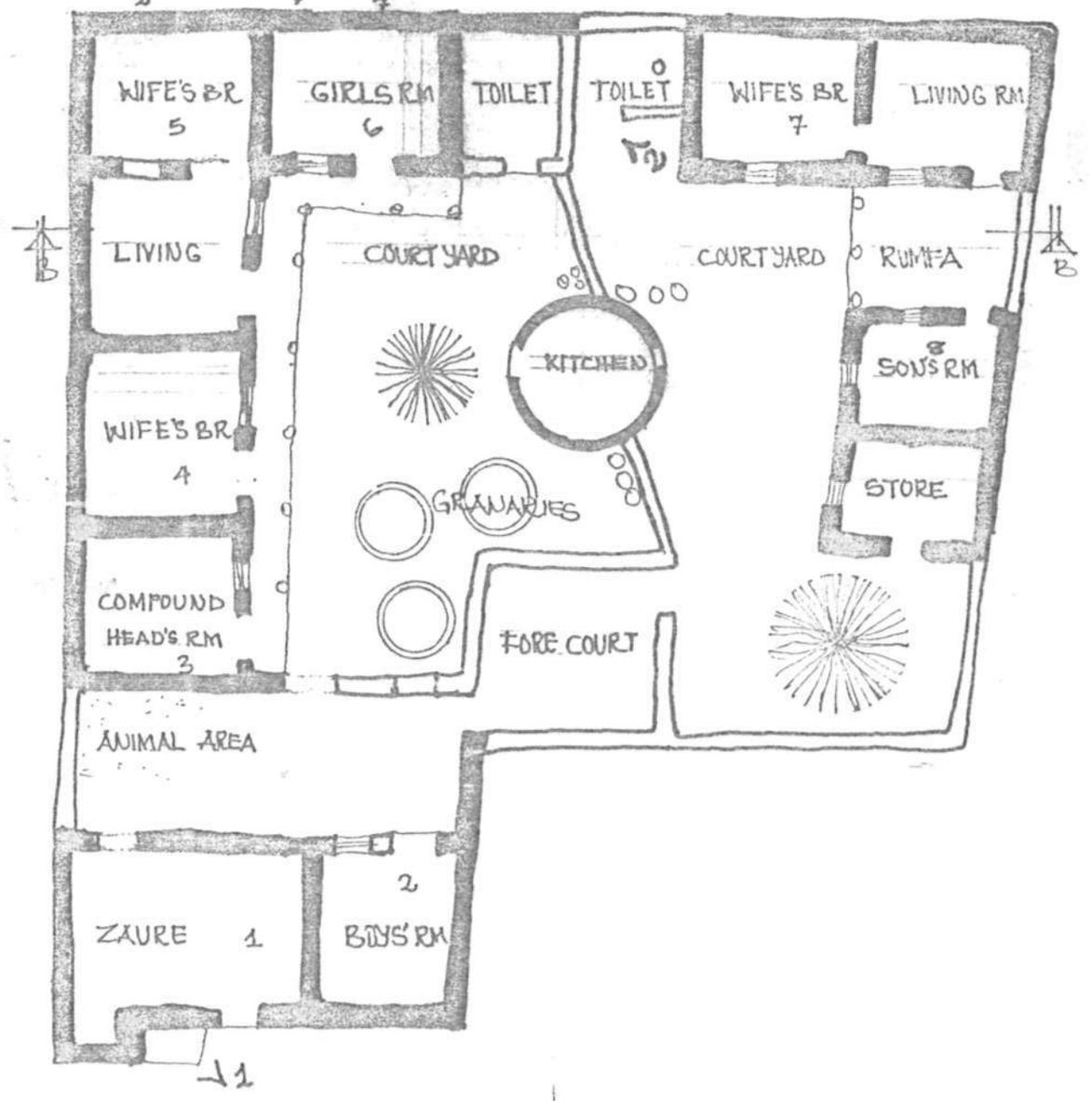
This house belong to Mallam Muhammadu Baba who is a butcher. He has two wives and four children. Each wife has two children and first son is married and has a baby boy.

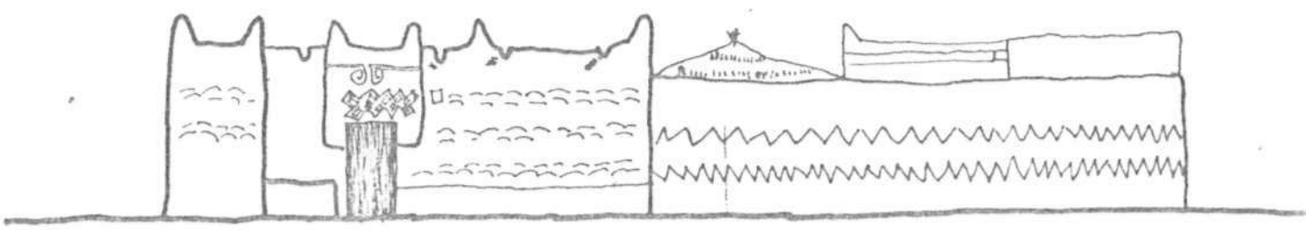
KINSHIP ORGANISATION

MALAM MUSA AB

LOCATION: KOFAR GA

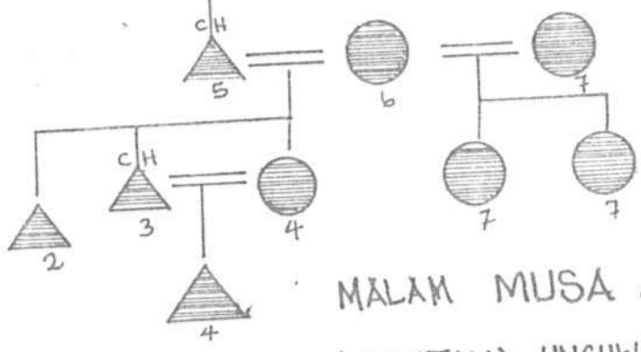






KINSHIP ORGANISATION

PLAN

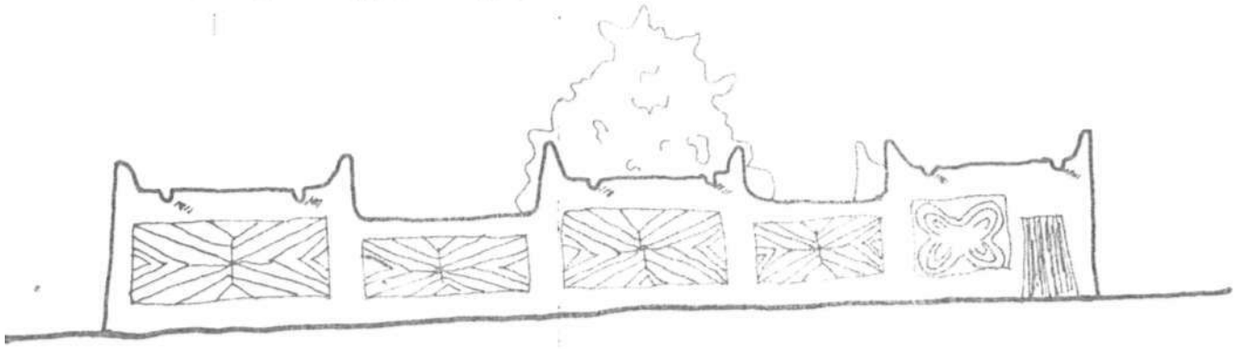


MALAM MUSA ABDU.

LOCATION UNGUWAR MAHAUTA.



PRIMARY EXTENDED FAMALY



ELEVATION

The buildings in the house are rectangular except the outdoor kitchen. The toilet and bath area is at far right corner of "Zana" fence. The tree shaded court-yard is particular large area for drying skins. Also food preparation like pounding, brinding are done in the court yard. For future expansion more rooms could be added from part of the courtyard. (See fig. 3.12).

Plan No. 9

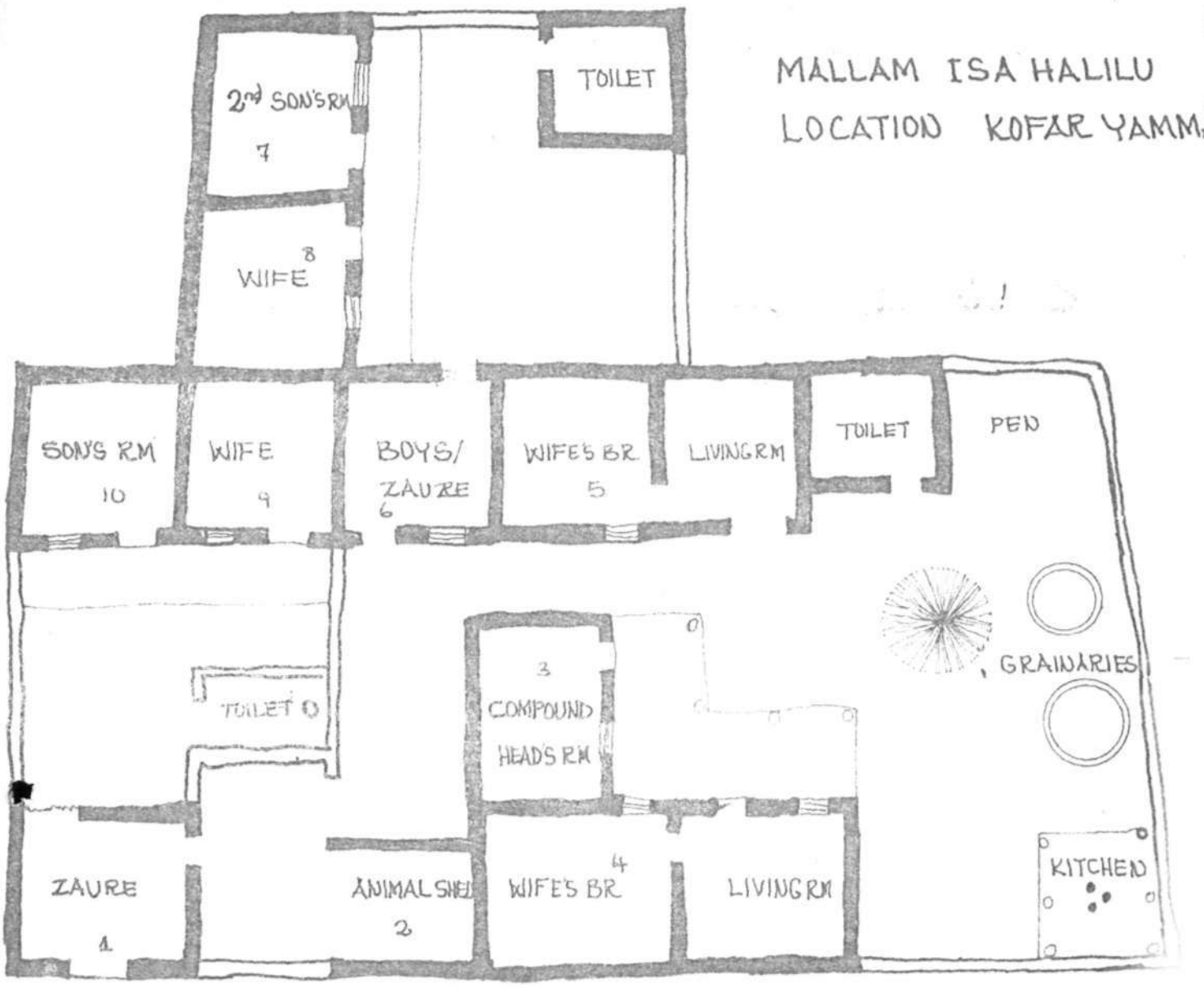
Complex Compound (Secondary extended family)

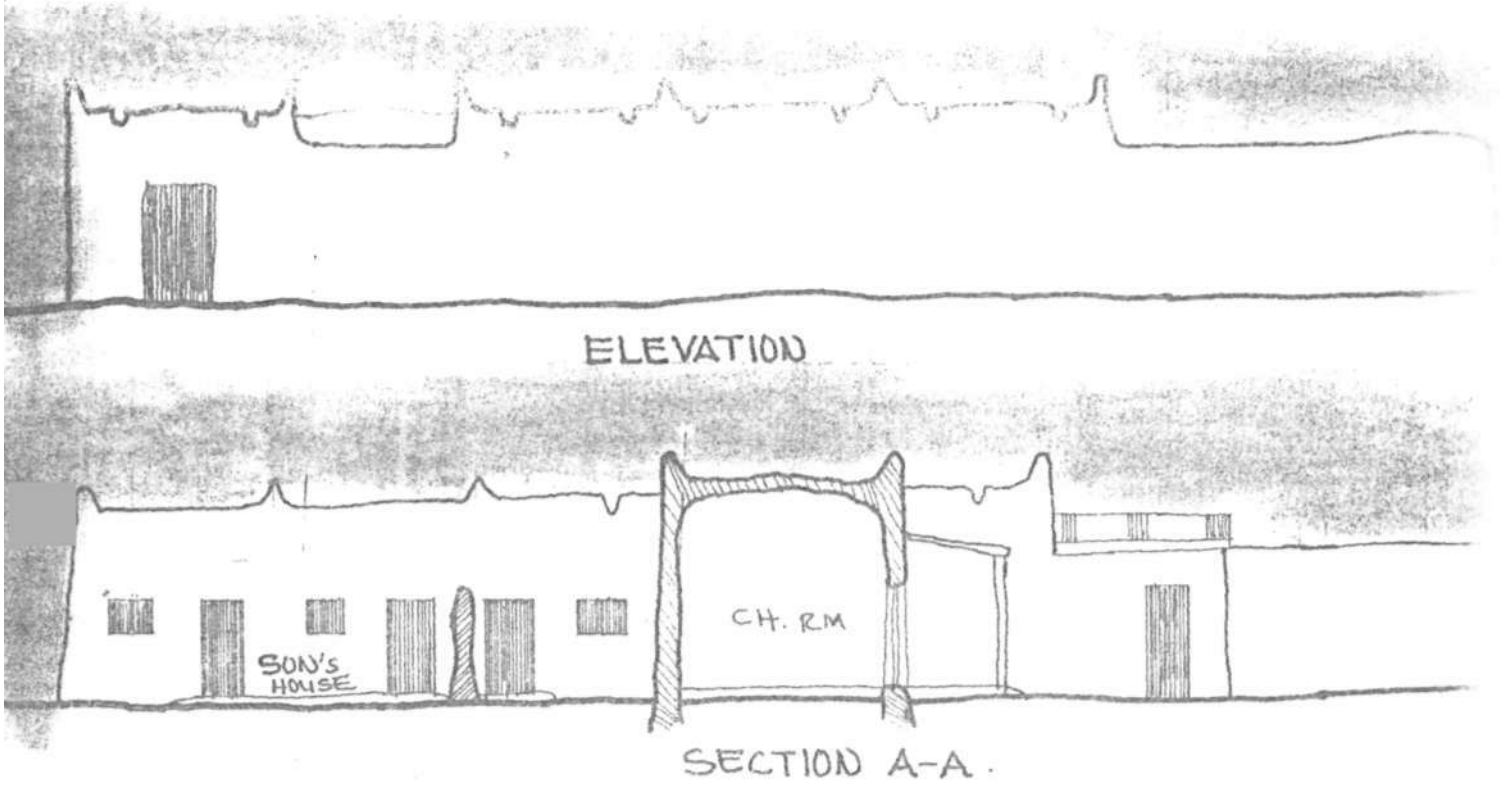
Location: Kofar Yamma

The name of the compound head is Mallam Isa Halilu who is a farmer and has two wives and six children. There are 3 boys and 3 girls. The eldest son is married and has a child. Likewise his next brother is married but without any issue yet. Each wife has a room which also accommodate her small children. The compound head occupies a room next to fore court before entering the inner zaure of his son's part.

There are 9 habitable rooms in the compound with shaded courtyard and within the yeard, there is two granaries and pen house. At the right corner, there is kitchen and out door cooking place. (See fig. 3.13).

MALLAM ISA HALILU
LOCATION KOFAR YAMMA





SECTION A-A.

Plan No. 10

Complex compound (Seeondary extended family)

Location: Kofar Kudu

The house is a physical projection of a complex collateral agnetic family unit structure in space. This shows the stages in which tradition compound may organically grow to. It is a compound house made up of 3 individual houses sharing a common main entrance hall or zaure. Head of house one and two are brothers and Head house three, is their father.

Broadly, the compound was built in mud-starting from the first house up to the third in an organic succession. The compact agglomeration of the different houses unit made ventilation poor. House three has a two storey building for the house head. Each house has a latrine of its own for convenience and the whole compound shared a common well as a focal point and a gossip centre for women (See fig. 3,14).

3·6·1 Observations

The study observed that this house shows a physical projection of Hausa family apart from the constructional and running economy, social security identitity and communal belonging exhibited. However, the short

coming of the compound lies in the open water running through houses as den's for mosquitos and it's ill ventilated rooms even though supplemented by private individual courtyards of each house.

3.62 Construction

i. Materials

The material used for the construction of wall is generally mud. It consits of sand and clay, which serves as a cementing agent because of its sticky nature.

(ii) Floors

The floors are made from special laterite called Burji. The laterite is firstly consolidated and then plastered with cement after levelling.

(iii) Walls

Walls are generally constructed with mud blocks as against the previous 'fubali' which gives a thicker wall.

(iv) Foundations

The foundation are shallow and made from consolidated stones.

v. Shaping factors

i. Family structure

ii. traditional ectended family,

iii Religion

- need for privacy and unity

iv. Climate

- Dry hot climates a call for court-yards and small openings to rooms.

3.4.3 General Findings

1. Architecture is a physical manifestation of the people socio-economic status thus grow organically.

ii. Spaces within and outside the houses are multi-functional.

iii. Cluster house is exhibited with two distinct house, types, single household and compound house.

iv. Use of mud and mud roof still prevalent

v. Entrances to houses are emphasized.

vi. There is ventilation problems in most of the houses.

vii. There is waste water and rain water drainage problems.

viii. There is the problem of open latrine and out door spaces only used as kitchen in most houses.

REFERENCES

1. Atkinson R.J. (1970), "Resettlement Scheme of the Niger Dam Authority International" Absestos cement Review.

2. Gniadzik J.S. (1985), "Traditional House Forms as a source for low cost housing design for Nigeria". Unpublished Ph.D. Thesis, Department of Architecture.

3. Mohammed B.B. (1988), "Mandawari Resettlement Scheme Towards Housing the Victims of Gidan-Shettima to "Goron Dutse a Highway Project". Unpublished M.Sc. (Arch) thesis A.B.U, Zaria.

CHAPTER FOUR

GENERAL REQUIREMENT FOR NEW SETTLEMENT

4.1 Site Location

The location of the new site for the resettlement programme is along Kano-Gwarzo road which is under Kabo local government (see fig. 4.1). It is bounded to the west by Zango village, to the South and north by Magaga river and to the east by Garo village.

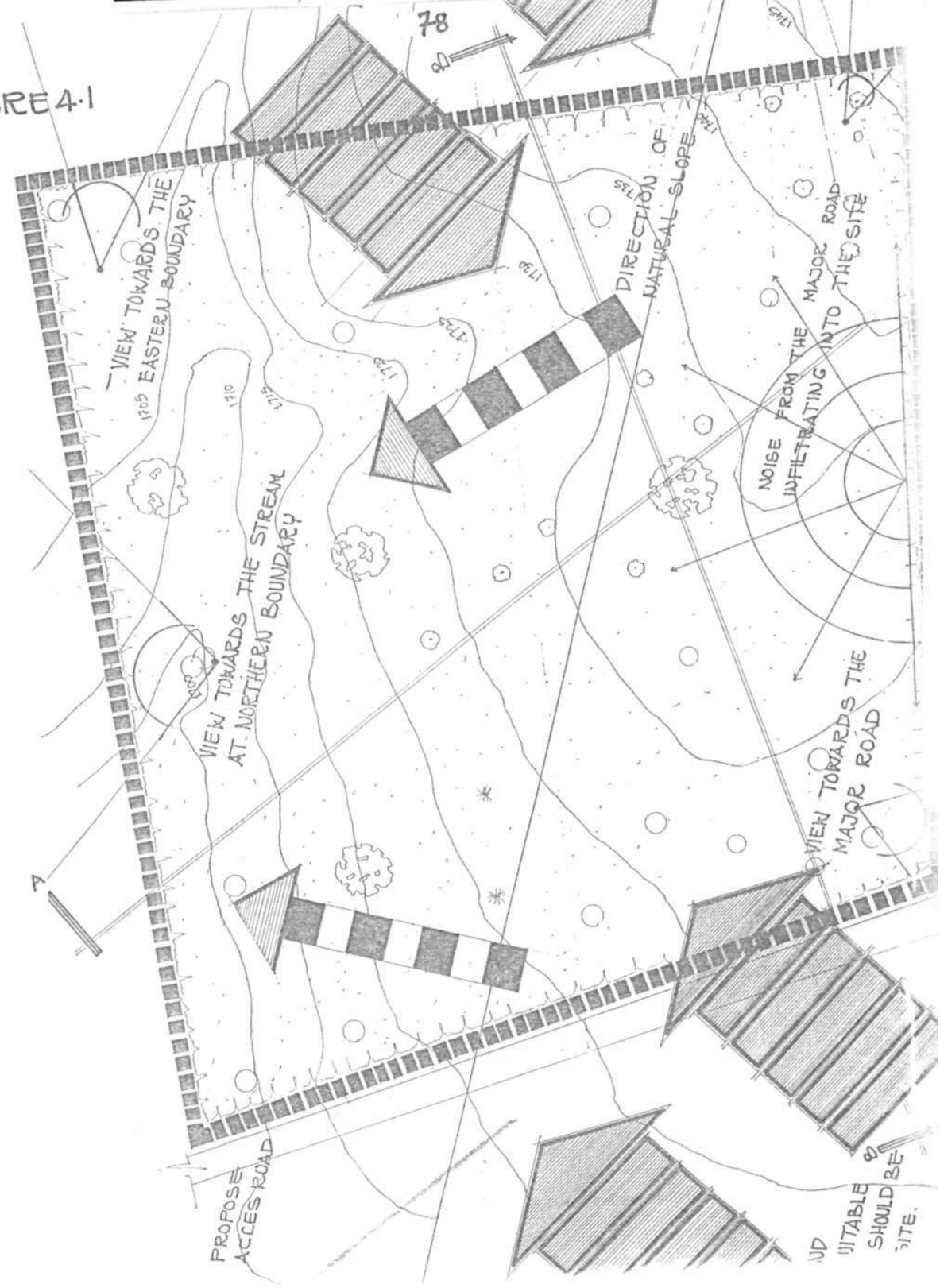
The site is selected by the government officials in collaboration with village representative due to the following advantages namely:

a. There is availability of good fertile land for agricultural development which is the main back bone of the Guide people.

b. The land is relatively flat with no physical feature that can hinder development of the settlement.

c. Economic development of communication link is easily available that is the Kano to Gwarzo road which will enhance access to the area.

FIGURE 4.1



SITE ANALYSIS

4. Not far away from the river, that is additional source of drinking water.

4.2 Size of Settlement Centre

The size of the settlement was determined by certain factors that indicate some requiremets. These factors are:

a. The average size of the family unit of the old settlement.
b. Availability of adequate fertile land
c. Availability of water
d. The time taken to travel from settlement centre to the periphery of farm land (depending on means of transport).

Studies on rural settlements in Latin-America carried out under the Auspices of United Nations experts came out with following data on maximum permissible distance of various means of transport with their speed as follows:

Means of Transport	Crushing speed Km/hr	Maximum Permissible distance(Km)
On foot	5	2.5
On horse back	6	3.0
On bicycle	10	5.0
On motor-cycle	25	12.0
Bus with stops	30	15.0
Jeep	40	20.0

In the study area most of the farmers go to their farms on foot and their average family unit of production was found to be about 2.5 hectares which is less than the average unit of production of Northern Nigeria is about 3.8 hectares.
In this case, the optimum size of agricultural settlement should have a radius of 2.5 km (maximum permissible distance on foot).

Therefore the area A, of land required for a settlement is:

$A = \bar{A}r^2$ where r = radius of settlement(2.5km)

$A = 3.14 \times 2.5^2 km$ $\bar{A} = 3.14$

$= 3.14 \times 6.25\ km^2$

$= 19.625 km^2$

= 1963 hectare

As stated above, the average family unit of production in agricultural settlements of Northern Nigeria is about 3.8ha. However with the improved farming techniques propose in thesis (such as mechanised irrigation). This unit could be increased to 4 hectares.

To find the optimum population of the settlement based on the above units, the following calculation follows: Let P be the optimum population of the settlement in the year 2002.

The average household size for this community is 7 people. Number of families = P/7

Area of land required A = P/7 x4ha

Where 4 is the units of production for agriculture

$$A = \frac{4P}{7} \quad \text{but} \quad A = 1963\text{ha}$$

$$\therefore \quad P = \frac{A \times 7}{4} = \frac{1963 \times 7}{4} = 3436$$

Population = 3436 people

4.3 Resettlement Farming

The primary occupation of the people displaced is farming and it is the objective of this thesis to increase food production in the state, in order to have self sufficiency. This thesis proposes the use of mechanised

irrigation farming in addition to the local methods.

The land for the resettlement farming is suitable for irrigation and water is pumped from Magaga dam by gravity. It is stored in the night in reservoirs found around the site. The use of syphon method of irrigation is to be considered. They has already been prepared by Kano Agricultural Rural development Authority (KNARDA).

The need for improvements in agricultural practices interm of soil conservation, livestock grazing control and improved production are to be identified. This involves the layout of the farmland along the contour strips of the site will meet these requirements and also allow the introduction of future improvements.

Also the need for improved farm management is generated both by National Policy and local conditions. The former requires more efficient farming and increase food production while the latter requires improved techniques to safeguard the farmland from over use. The introduction of mixed farming system could meet these needs.

For farm mechanisation, an alternative range of system and machines that could benefit the small holder farmer can be suggested. This is due to high cost of sophisticated farm machinery and increasing cost of fossil fuels. The range involves the use of animal power, improved handtools and system capable of harnessing natural forms of enough. Thus:

a. On - drawn implements - include the ridging plough and so on.

b. Man-powered machines - include hard driven grain thresher, hand driven ground nut shellerand so on.

c. Water-powered pumping devices - like inertial pump.

To improve production, the authority has some vital roles to play. Apart from providing the families with economic land holdings and mechanical inputs which is on loan basis. The authority should also provide them with fertilizer and improved seedlings during the farming season. This is done through Kano Agricultural Supply Company (KASCO) at subsidise rate. While KNARDA enlight the farmers on the

use of modern farming implements, techniques and better organised market system to purchase surplus produce should be provided.

Two types of farming organisation are considered namely:-

1. Individual title or ownership farming
2. Co-operative farming

The possibility of evolving co-operative farming in this resettlement scheme is higher due to the advantages namely:-

1. Bulk purchasing and selling which reduces the operation of the middle men.
2. Easy procurement of agricultural loan and inputs such as machineries, chemicals and improved seedlings.
3. It gives the farmer a democratic say in the affair of the community.
4. Easy implementation of modern farming techniques.

The relegation of the individual title is due to its difficulty in procurement of agricultural loan and lacks the advantage of organised marketing. Thus bringing in the bureaucracy of the middlemen.

4.4 Space Requirements

4.4.1 Basic Functional Spaces

Basically in residential layouts there are three types of functional spaces namely:

1. Space for circulation (Major and Minor)
2. Space for plots or uhit houses is that land allocated mainly for building development.
3. Space for communal facilities and utilities requirement is that which hosts these things, surrounding and environments that make life pleasant and easy, for the settlers.

4.4.2 Space Standards

Planners and architects have worked out standards for residential layout functional spaces:

1. Communal facilities should have 10-15% of the design area.
2. Circulation and open spaces should have 15-25% of the total designed area.
3. Recreational facilities 5 - 10% of total land.
4. Residential plots should have 50-55% of the total designed area.

For the purpose of this project the above standards are used asa guide in the distribution of spaces to various function.

4.4.3 Space hierarchy and Arithmetic

i. Space at site level

- Communal facilities

This is allocated 25% of the total designed area of the site. This allocation is intended to accommodate increasing communal facilites on site as the population grows.

- External Circulation

The need for major circulation routes within the site and the building set backs from major roads is allocated 10% of the total designed area.

- Internal circulation and open spaces

Access within wards to and from the multi centred communal spaces they link are allocated 15% of the total design area. This is so allocated to facilitate free circulation of air within wards.

- Residential Plots

The residential plots are allocated 50% of the total land to be design.

This calls for communal functional space to host commercial, educational, socio-cultural health, welfare recreational, industrial and religious activities which follow as:

Commerce - Market/Motor park allocated 2.5 hectare

Education - Primary school will be based on the practice of 45 pupils/class of 2 tier system(a,b) a primary school of 6 classes therefore will absorb (45x2) 6 pupils. The school will require an area of 2.5 hectares to cater for built-up areas and out door spaces.

Dispensary - The dispensary is necessary to take care of minor problems due to the distance of site from the nearest hospital (Gwarzo Hospital). An area of about 1.5 acre is also provided including open spaces.

Welfare - Pohice post, post office and fire service allocated about 1 hectare.

Recreational - Garden and focal point allocated 2 hectares.

Industrial - Light, small scale industries allocated 1.5 hectare.

Cementry - There is existing cementry but is far away from the site and allocate 1 hectare.

Religious - Jumuat Mosque allocated 1 hectare

4.4.4 Space Requirement at Ward Level

For administrative and identity purposes the distric will be divided into wards to be headed by ward heads. Thus need for:

Ward head Residence: allocated $25x30m^2$ or $750m^2$

Islamiya or Quranic School and Mosque

Two for each ward: allocated $30x30m^2$ or $900m^2$ Though the Quranic schools and mosque evolve naturally at or around houses of learned (Malams) in the traditional content, but for convenience that project deems it unfit to leave the above to the mercy of the people. However these Mosques and schools proposed will not deter the coming up of others within Islamic right.

Space at Ward Level - Spaces at ward level include semi private open spaces and an open dandali that links the semi-private open spaces together and itself acting as a centre for commercial, religious

and recreational activities. The open dandali also serves as a relief for pedestrains who after walking through the narrow footpath are relieved at the open dandali before disappearing into another narrow path.

Space at Cluster Level

Cluster housing design principle as prominenly featured in the study area and as found still relevant, is here modified and adopted. Houses are organised around Neighbour hood or communal open space linked to another by major and minor access spaces.

4.4.5 Space at House level

Space at house level range from the size of plots to size of sizes of various functions within the house. - Space within the house.

The house as found in this study is basically made up of multi-functional spaces and influenced by family size. Using an average family size of 7 person per house, the following functional (average, could be plus or minus) spaces will be used.

Space Standard

SPACE	FORM	SURVEYED AREA	STANDARD AREA
Entrance hall	Round, Square	$9-16m^2$	$12m^2$
Courtyard	Undifined	-	-
Bedroom	Round, Square	$9-15m^2$	$16m^2$
Store	Round, Square	$6m^2-9m^2$	$9m^2$
Kitchen	Round, Square	$6 - 9m^2$	$9m^2$
Bathroom	Square open	$3 - 4m^2$	$3m^2$
Toilet	Square	$2 - 3m^2$	$3m^2$
Granary	Round	$2 - 4m^2$	$3m^2$
Goats/Sheep	Round	$4 - 6m^2$	$9m^2$
Fire wood	Open	$3 - 4m^2$	$4m^2$

- Sizes of plots

The people displaced are typical rural farmers and the new settlement will function as an agricultural village centre. There is fairly low residential density. In the development of new houseing at the proposed site, a low density of about 100 person per hectare.

Calculation

Not residential density = 100p/hectare

But 1 hectare = 2.5 acres

$= 2.5 \times 400m^2$

$\therefore$ 1 person will occupy = $\frac{25 \times 400}{100m^2} = 100m^2$

by one person.

Since the residential plot will occupy 50% of the total designed area

∴ Area occupied by 1 person per plot will be 50% of net area occupied by 1 person, and this is

$$50\% \text{ of } 100m^2$$

which is equal to $\frac{50}{100} \times 100m^2 = 50m^2$

Since the average family sizes had already been established in Chapter 2. These averages will have been used in determining the sizes of the plots

a. Small - used in determining the sizes of the plot

For 7 family house (Primary nuclear)

Area of plot need = $7x50 = 350m^2$

This is a little bit big than the size given by Kano State government which is 50ft x 70ft when converted to metre is $15.5 \times 21.7m^2 = 336.35m^2$ This plot size is accepted here as the minimum and size so as to allow future growing family.

b. (i) Medium and (ii) large size plots.

This will allow the people at least have backyard vegetables garden as a subsidy in the economic running of the house and will give an opportunity for rearing animals as you can not separate a former with his animal. It is also thought this bigger, plot sizes will allow

organic growth nature of the Hausa house communal living and social security.

(ii) Medium Plot size

This is of an L-shape, (fig (4.2.) one and a half the size of the state plot covering an area of $525m^2$. This can be compared with the calculation for the family of 11 persons that is:

Area of plot size = $50m^2$ x 11 = $550m^2$

This is bigger than then state plot size but the first one is adopted so as to go in line with state size.

(iii)Large Plot

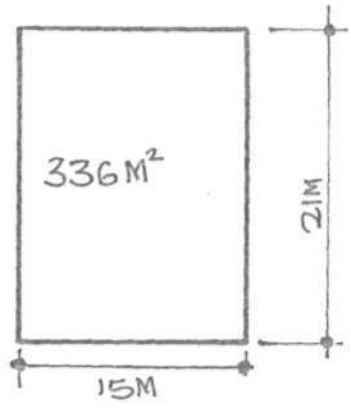
This is rectangular in nature of $25x30m^2$ dimension covering an area of $750m^2$. This is the largest plot on the site which is a little bit bigger the 75ftx100ft offer by the Kano State.

For the family of 15 persons:

Area of plot size = 15x50 = $750m^2$

This three plot sizes are evolved to represent the 3 fold family structure identified during the study. Although some schools of thought in housing design hold that plot size should be related to family size and increasing family size. This thesis adopted that methodology even

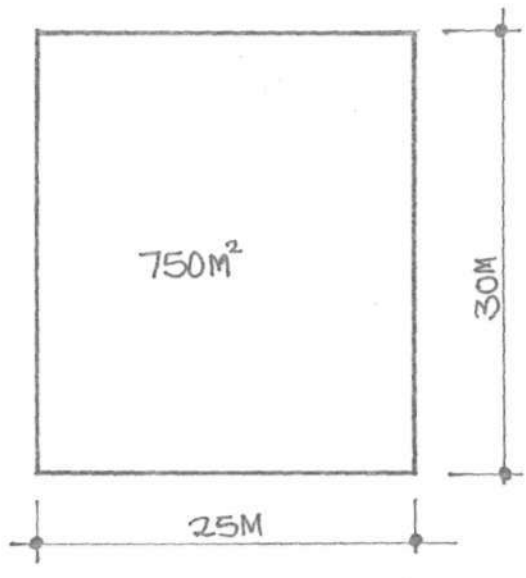
FIGURE 4.2 PROPOSED PLOT SIZES AND SHAPES.



TYPE A
SMALL PLOT



TYPE B
MEDIUM PLOT



TYPE C
LARGE PLOT

though some large family sizes are not economically poten as to develop the large plot size, this went on selling them even if obtained.

But this is not withstanding because a criteria will be used in giving out the plots tothe various family size. In the field survey conducted during this study, family size and habitable room was obtained with their correspondent percentages.

Family size	% of total family
1 - 7 person/family	73.4%
8 - 11 person/family	20.9%
12 - plus	5.7%

Table 4.1

The above was as a basis for proportionate allocation as follows:

Family Size	% of total family	Plot size
1-7 person/family	72%	Small plot
8-11 person/family	22%	Medium plot
12 plus person/family	6%	large plot

Table 4.2

From the calculation of the optimum population of the settlement in the year 2002 which is 3436 people, the number of household can be obtained using the average family size 7 person.

Number of household or plots = $\frac{3436}{7}$ = 491 plots

Small plots will have = 72/100 x 491 = 353

Medium plots will have = 22/100 x 491 = 107

large plots will have = 6/100 x 491 = 30

490plots

REFERENCES

1. Hadejia - Jama'are River Basic Development Authority Information Brochure.

2. Kano Agricultural Development Authority(KNARDA) Information Brochure.

3. Kano Agricultural Supply Company (KASCO) Information.

4. Mohammed B.B. (1988), Mandawari Resettlement Scheme, Toward Housing the victims of Gidan Shettima to Gordon Duste A Highway project.

5. Omusa N.M. (1966) Ushafa Resettlement Scheme A resettlement for the people displaced by the Lower Usman Dan Unpublished M.Sc. (ARCH) Thesis ABU Zaria.

CHAPTER FIVE

CONCEPTS DEVELOPMENT AND EVOLUTION

In order to decide on what type of planning concept to be used in the planning of the new settlement, various planning concepts were analysed before arriving at the one to be used. However, the fact that the new settlement was to be based on:

a. Existing site conditions

b. Social, political, economic, cultural and religious values.

5.1 Established Design Concepts

Planning and design of residential layouts fall under the following types of settlement systems, each of which has endless variation that allow it to adopt to local conditions as well as particular advantages, disadvantages, requirements and performances characteristics (See fig. 5.1a-5.1f).

a. Linear System

Advantages

- High accessibility
- Adaptability to linear growth
- Useful along limiting edge

FIG. 5.1a LINEAR PATTERN

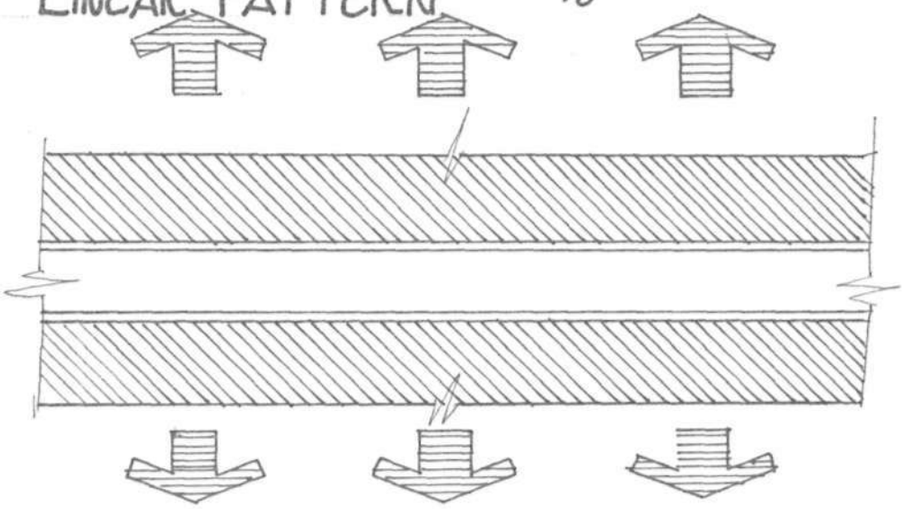
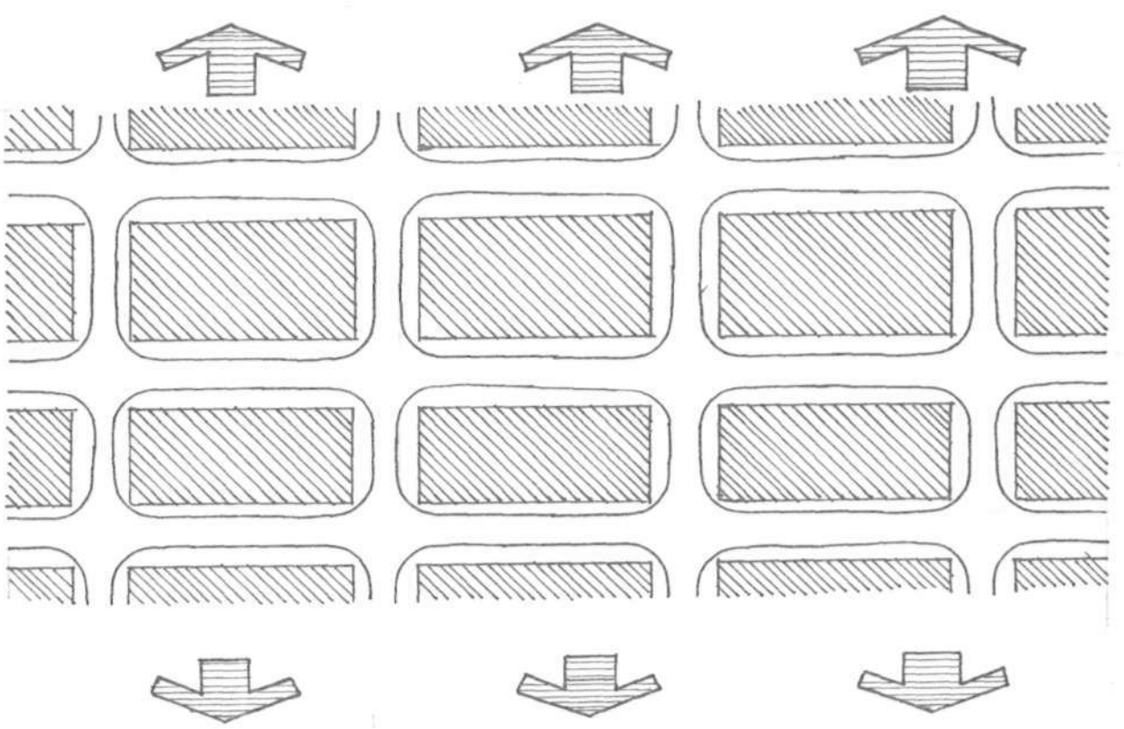


FIG. 5.1b GRID PATTERN



Disadvantages

Very sensitive to blockage

Requires control of growth

Lack of focus

b. Cavid Settlement System

Advantages:

- High accessibility
- Minimum disruption of flow
- Expansion flexibility
- Excellent Psychological orientation

Disadvantages

Potentially monotonous

Require flow heirarches

Ring (Radial) Settlement system

Advantages:

- A direct line of travel for centrally directed flow.
- Communual sense of unity
- Allow for junction emphasis

Disadvantage:

-Difficult building sites

-Subject of central congestion

-Curred ring roads

FIG 5.1c RADIAL PATTERN.

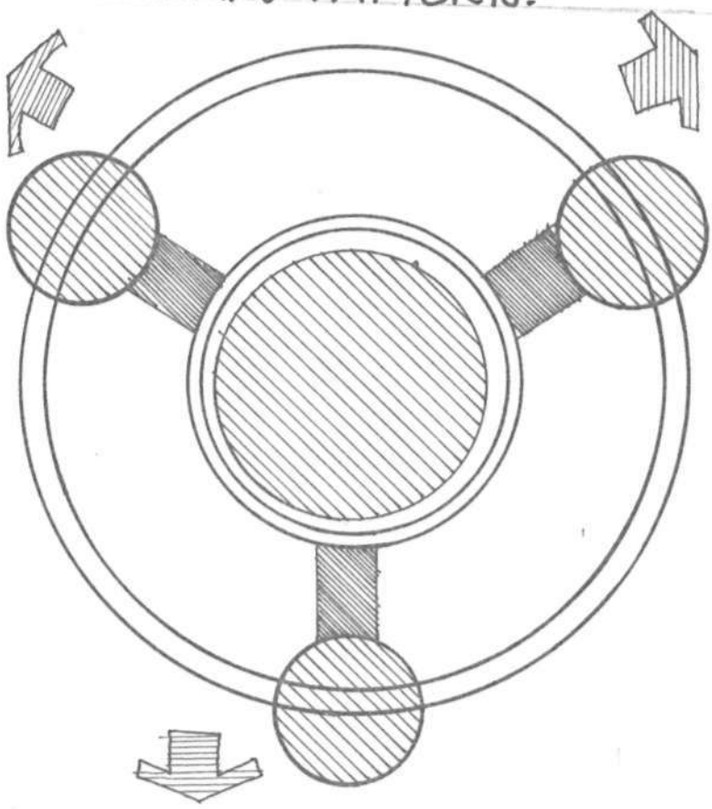
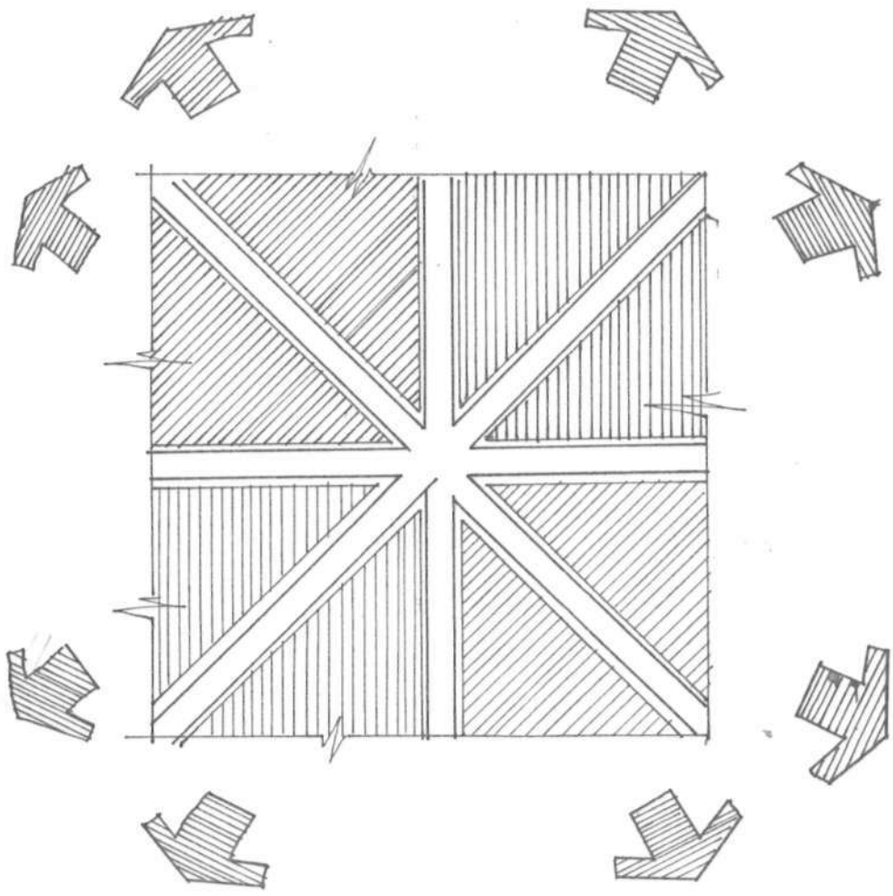


FIG.5.1e STAR PATTERN.



Multi Centred Settlement System

Advantage

- Optinal location for focal points and system terminals.
- Good psychological orientation
- Adaptability to existing conditions

Disadvantages:

- Depends on stability of key points
- Potential accessibility problems
- Complex junctions

Star System

The star system supports the hierachy of urban functions and provides easy short access to the central distric. It allows extensions to all directions but not unlimited growth since the distance between the beams increase simultaneously. Moreover it tends to cause an unbalanced distribution of loads.

Loose-Knit Settlement system

In this system, the dwellings are scattered irregularly over a fairly large area, too close to be considered isolated yet far away to suggest no obvious nucleus.

FIGURE 5.1c LOOSE-KNIT PATTERN

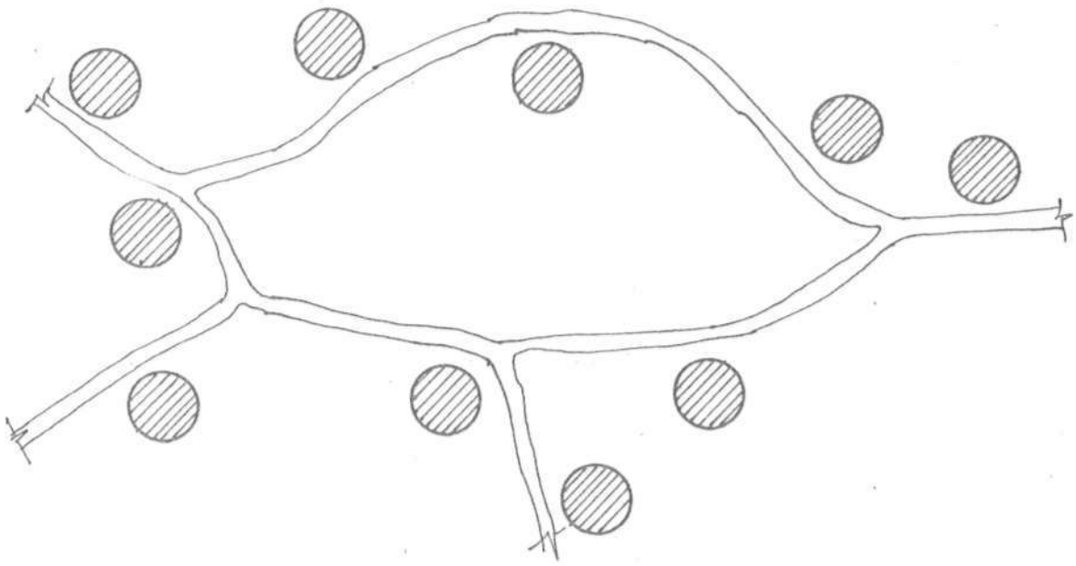
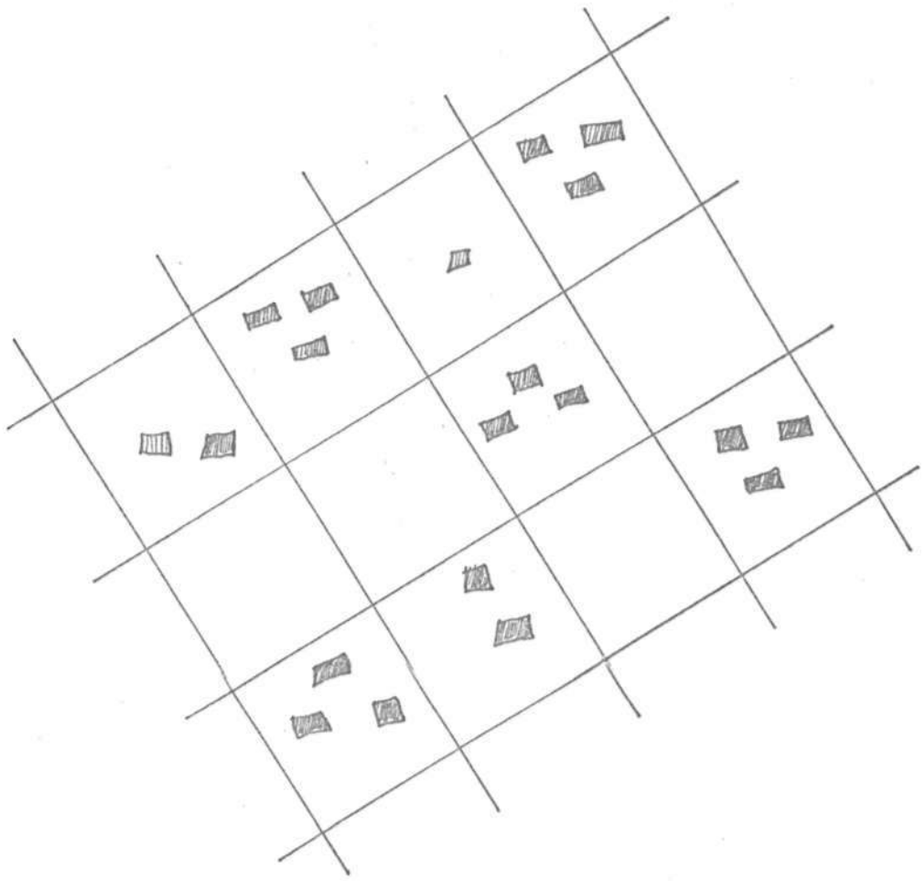


FIGURE 5.1d MULT CENTRED PATTERN



5.1.1 Site Zoning Concept

In zoning the site, the communual facilities were placed at the centre as identified in the study area which was the Hausa traditional concept of planning. The market and motor park are excluded because it will become a subject of central congestion and at the same time to allow for future expansion. The residential areas clusters around the communal facilities.

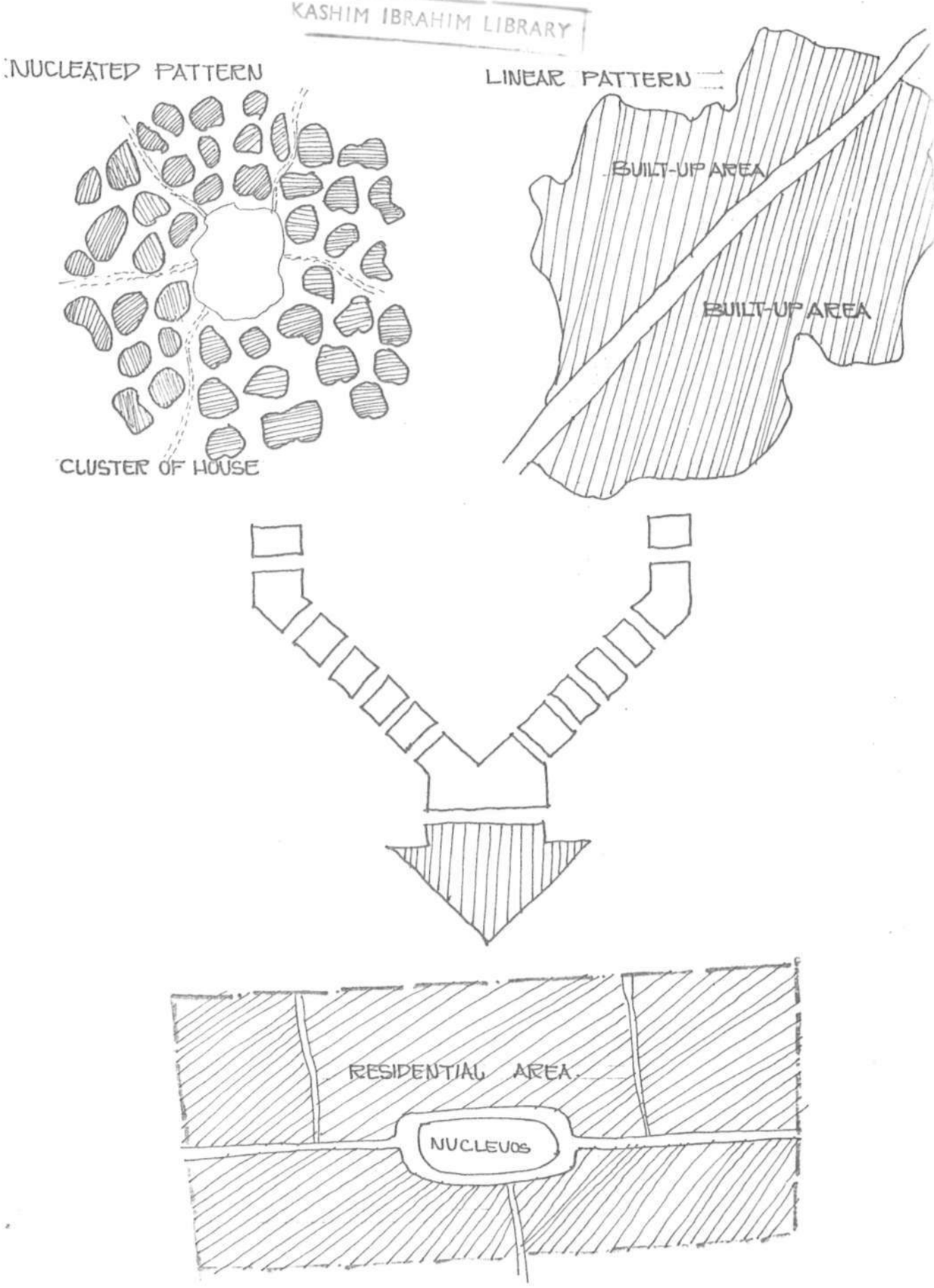
5.1.2 Site Design Concept

The concept adopted in designing the site is based on the existing settlement pattern which was nucleated. Where by the village square was located in the middle adjacent to village head's compound. This is a kind of central settlement which gave sense of belonging in the community.

So in arriving at the concept to be used a hybrid of traditional pattern practiced in the area, that is the central pattern with a nucleus and the linear pattern. In the composite pattern derived from the merger, the intended nucleus is to be occupied by the communal facilities mentioned in 5.1.1 and village head's compound (See fig. 5. .2).

FIG. 5.2 EVOLUTION OF PLANNING CONCEPT.

KASHIM IBRAHIM LIBRARY



Some of the advantages to be derived from this composite pattern are:

a. Accessibility to central facilities from all parts of the settlement will be easy.

b. Movement to residential areas will not be hampered by the central area.

c. Expansion of commercial centre will be easy

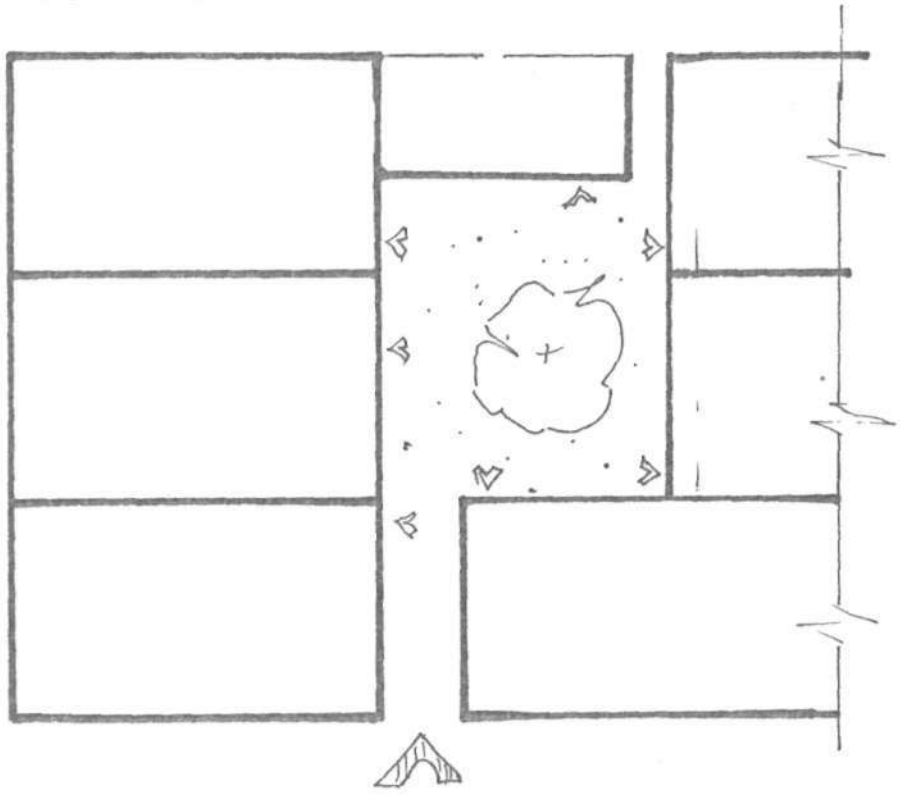
d. There will be free flow of movement within the entire site. That is both pedestrial and vehicular.

5.2 Cluster Design Concept

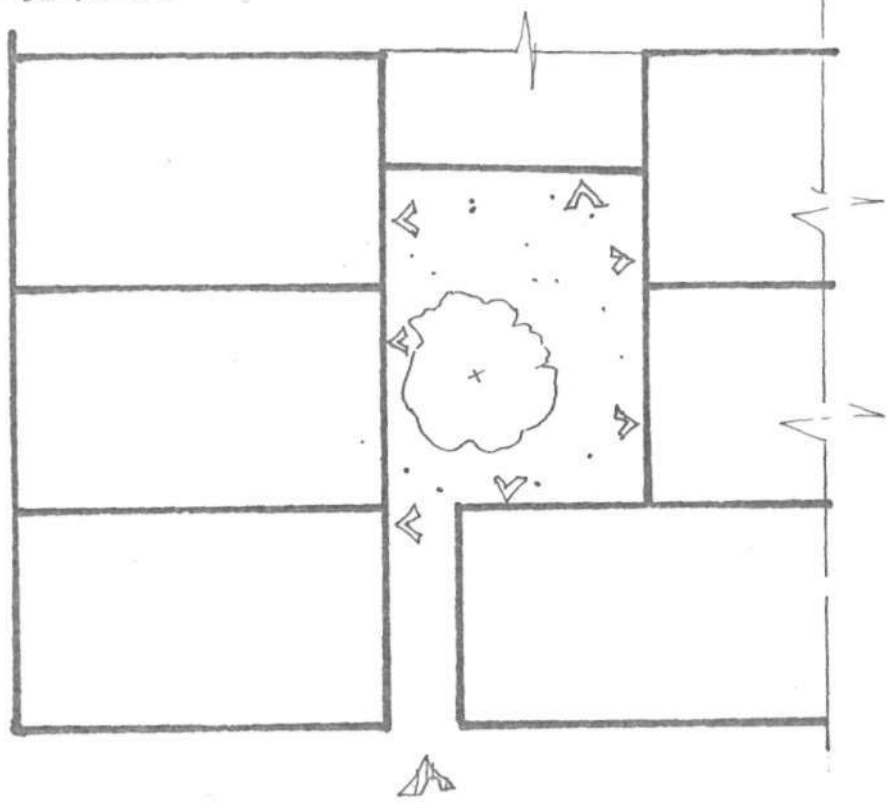
Cluster is a collection of houses designed for communual living and increased social interaction. There are two types of clusters recognised in this work; the loop cluster - composed of houses designed around a common open-space with a common single access and the open ended cluster - made up of houses or ganised around a common semi-private open space with two or more access points.
In any case the setting is a means of unity, security, privacy and identity. (See fig. 5.3)

FIG.5.3 CLUSTER DESIGN CONCEPT

OPEN ENDED CLUSTER.



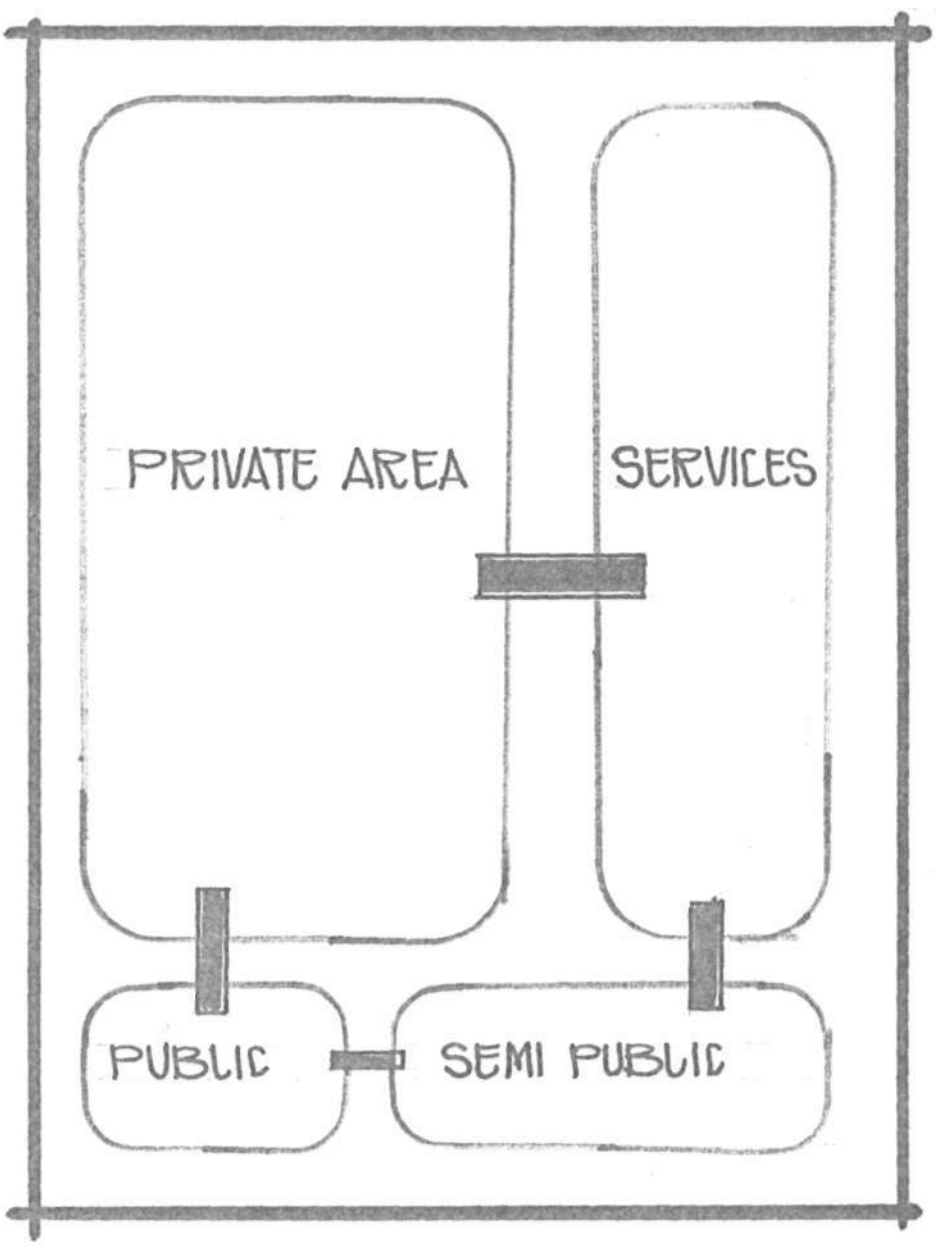
LOOP CLUSTER.



5.3 House Unit Design Concept

In this case the concept of space hierarchy is upheld. However an integration of **functional** zooning is done by zooning services on one side and living on the other side and the two linked by multi-functional spaces zone. (See fig. 5.4)

FIGURE 5.4 HOUSE UNIT DESIGN CONCEPT



REFERENCES

1. Federal Ministry of Housing and Environment: Rural Housing Research (1981-81) prepared by Department of Architecture and Department of Urban and Regional Planning.

2. Sa'ad H.T. (1974) Resetling the Jarawa People. Unpublished M.Sc. Thesis A.B.U. Zaria.

3. Temlong, N. (1986), Sabon Gida Resettlement Scheme. An Exposition of Tarok-Traditional Architecture, Uhpublished M.Sc. Thesis ABU Zaria.

CHAPTER SIX

DESIGN REPORT

6.1 Housing Units

> Design of a dwelling as a human habitable shelter seems on the surface to be simple, but deep inside it leave some of the most complex non-resolveable design factors architects have with and die with. This made house design a tedious one, the most difficult ones and often a frusting one (1)

The design of dwelling units prototypes here, therefore lay more emphasis on solving the identified cultural needs and problems with the existing traditional housing in order to increase level of human comfort.

Primarily the study identifies three types of dwelling units reflected the three tier family unit structure.

6.1.1 House Type A

This stands for the nuclear or primary unclear family unit structure. The house is design to accommodate an average of 7 people (excluding guest) on a plot of 15 x 21m. This include the compound head, his average two wives and two underage children who will occupy the children room and two adolescent

boys to occupy the boys room. On entering the Zaure, into an open fore court, to the right is the guest and the adolescent quarters which have two rooms, a toilet and a bath. Due to the fact that the majority of these people are rural farmer, an aminal area is provided to the left of the Zaure, gaining access from outside.

Inside the house is gained through "Shigifa", a provision is made for an average of two wives, daughters, storage, granary and a kitchen which is accompanied with an out door cooking area.
The location of the compound head's room is very crucial and is located in such a way that he has complete control of movements in and outside the house. A multifunctional court is also provided with planting area on the left and a general toilet and bath.

6.1.2 House Type B

The house stands for the primary extended family structure. The house is designed to accommodate an average of 11 people within an area of $475m^2$.
This include the compound head and an average of 2 wives, his married son and his wife and an average of 6 children. On entering into the Zaure, to the right is the adolescent and the guest area a toilet

and store. Infront of the Zaure is a shop which access is gained from outside and inside from Zaure. From the Zaure, is a small open space that will house the compound's refuse bin. From the fofecourt access is gained to the compound head part and a shigifa to son part. The section of the compound head consist of his room (which will be the first to be on entering) his two wives. The daughters room, toilet, a bath, a store and a kitchen which is associated with an outdoor kitchen. After the second wife's room, there is animal area which gained access from back of the coumpound for animal and for people from inside. A multifunctional courtyard is also provided with 3 granaries at the left side. The son's section consist of his room, his wife's room, a toilet, a bath and kitchen associated with out door cooking space. Within the courtyard a planting is provided which later can be used for future expansion.

6.1.3 House Type C

This is bidgest of all the three house types. It stand for secondary-extended family unit structure. The house is designed to accommodate an average of 15 people on an area of 750m^2.
This include the compound head, his two wives, his two married sons each with a wife and average of 8

children. On entering the Zaure to the right is a guest and the adolescent boys area with a bath, a latrine and a store. Left to Zaure is a tradition workshop for tradition ironing after it, is animal area with separate entrance from outside. After the Zaure is fore court which housed the compound's refuse bin from where access is gained to Shigifa or left that fore court is another fore court where granaries are sitted. The shigifa acts as a medium for branching into various sectioh of the house. The compound heads section consist of his room, his two wives rooms with common living room which can be for daughter during the night.
A toilet, bath, storage and a kitchen associated with outdoor cooking space. At the back of the wives rooms is a planting area which can be used for future expansion. The two sons share the same court yard, fire wood storage but each has a room for himself and his wife with different kitchen and toilet.

6.2 General Improvements

6.2.1 Openings

Openings to the outside as much as possible is minimized, however, where inevitable they are made up on the walls to avoid inner view of the houses, enhance social security and privacy.

Where high level windows are used, to avert the passage of dust into the interior; the windows are fitted with a permanent unclined wooden louver frames which cuts the incoming air at an angle collect the dust it carries on the slopy louvre blades and keeps it outside the room. This will also exclude rain water.

6.2.2 Ventilation

Ventilation is by means of high level small windows on one side and large windows on the other side walls. Usually facing the inner courtyard.

In hot dry climates the external air is hotter than the indoor air during most of the day time. As such openings are minimised and where they exist they are shaded and closed during the day time. At night the outdoor air is cooler than the indoor air and windows could thus serve a useful junction when opened. Therefore the high level windows are also filled with a rotating wooden louvre for closing and opening.

6.2.3 Latrines

The problem of digging a new or emptying a filled latrine has been with the construction of pit latrine. This project looked at the pit

latrine in comparison with others types of latrines and adopted the pit latrines with improvements that will solicite its short comings.

The proposed pit latrine will have bore pit, floor, super structure and some accessories like fly screen and pit ventilation.

6.2.4 Livestock (Animal-shed)

A definitive allocation of space for livestock will be made, so that they don't share the same court yards with the inhabitants of a compound for hygienic reasons.

6.2.5 Kitchen

This rural housing scheme will recognised greater needs for storage spaces both for cooking utensils as well as food items, and importantly the possibility for a compromise between indoor and outdoor cooking spaces.

6.3 Distribution of Services

6.3.1 Water

Water supply is an indespensable requirement for life, health and nearly all activities of human society.

However, at the new site, a bore hole could be sunk at appropriate places. Alternatively pumps could be installed to pump water into an over head or undergraound tank so that people can fetch through the use of pipes installed to serve groups of compounds.

6.3.2 Surface Water Drainage

For effective drainage of both storm and waste water, drainage channels are to be constructed on both sides of all majors. The drainage channels within the residential area should be of open concrete gutters with iron bars covering the top to avoid casualties and all are channelled towards the naturally sloping direction.

6.3.3 Waste Product Disposal

The collection of solid waste will be collected primary in dust bins of individual houses, from where children will convey it to a centralised collecting and disposal centres within maximum walking distances of 300m Local government refuse disposal then disposes it to farms of those within reach.

6.3.4 Sewage Disposal

The disposal of solid waste is of critical importance for health and good living conditions. In view of this fact, the waste water from individual houses will pass through the pit latrine as a means of flushing the improved pit latrine and into the soakway pit.

6.3.5 Electricity

The provision of electricity is necessary for the upliftment of the standard of living of the people. In fact the lighting up of residential areas and their surrounding is a necessity for convenience and security. The rural electrification board should be responsible for the provision of such electricity.

CHAPTER SEVEN

BUILDING CONSTRUCTION AND MATERIALS

Although this scheme hope to give habitation that will conform with the people's contemporary tradition, culture and architecture. It however intends to make use of locally available building materials, yet providing modern accommodation.

As a means of achieving the aim, the entire construction will be carried out in either mud bricks or earth blocks produced from stabilised mud. The use of mud as a building material does not necessarily affect the quality of building if adequate measures are taken with regards to constructional details and maintenance schedule. Infact, recent research has estimated that mud buildings can last for a period of 100 years if adequate maintenance is carried out regularly.

Despite the fact that scheme will be based on the traditional architecture of the people, it does not mean that all materials to be used must be the same as that used by the people traditionally. These materials will be chosen based on its merits. For instance, the mud roof which is a traditional material of the Hausa people will be

discarded due to its yearly maintenance. In other words, it becomes pertinent to mention here that the people in those days used materials available to them. Today, we are in different times with better materials available to us. Thus, our refusal to use such materials in the name of tradition is uncalled for because traditional is not synonymous.

7.1 Soil Stabilisation

One of the most important objective of soil stabilisation is to increase the resistance of soil to the actions of destructive agencies such as water. There are 3 main ways of soil stabilisation namely:

a. By increasing the strength and cohesion of soil
b. By reducing the movement of the soil caused by changes in the moisture content.
c. By making the soil less readily wet.

A number of soil stabilisation method have been developed over the years. These include the non-scientific adhoc method that usually yield results good enough for the villagers but not as good as to be applied in modern building technology. The tradition method include:

a. The addition of certain plant juices
b. Mixing of soil with crushed anti hills, straw, animal dung
c. Reducing the alkalinity of clay by burning slightly.

Scientific method evolved in various building research stations, the world over involve the increase of strength and cohesion of soil by addition of cementous materials which help to cement the soil particles together in manner analogous to the way it blinds aggregates in a normal concrete mix.

Test on stabilisation of soil at ABU Zaria, India, U.S.A., Pakistan and some African countries indicated that depending on the nature of soil, the amount of cement and the clay content, soil-cements may be made from almost any soil free from salt, rubbish or vegetable matter. And that any soil suitable for making ordinary dried brick is equally suitable for making soil-cement blocks.

Depending on the intended use and climatic conditions, it has been found that about 5% to 12% cement by volume may be added to the dry sitted soil. Even though the mixture for making

blocks work will not exceed the amount that will produce 100 blocks. This is due to the fact that the more time the mixture take when it is wet, the more it losses strength. Therefore, it has to be done 100 blocks, then another mixture of 100 blocks. The table below shows mix soil cement proportion.

Soil-Cement %	Usage	add cement	To the prepare soil mixture
5	Courtyard walls	1 part	18 parts
7	House walls	1 part	13 parts
10	Foundation	1 part	9 parts

Table 7.1

Some times one finds it difficult to realise his wants in building because of initial capital constraints. Some people would want scientific method but the exhorbitant cost of cement nowadays is prohibitive. In this regard, a first method is proposed during the first stage. When economy later improves a scientific method will be used.

7.2 System of Construction

There are basically, two systems of construction which this scheme considers viable.

The first one is for the people to build the house themselves making use of their available local materials. As the saying goes:

> "In an economy of scarcity the mass of the common people though /poor possess the bulk of the nation's human and material resources for housing. Their collective entrepreneunal and managerial skill (and spare time) far surpass the financial and administrative capacity of even the most highly planned and centralised institutional system whether dominated by state or by private.capitalist corporation".(1)

The secohd system is for the government to build the houses for the people. The second system tend to exploit the people as was seen in other resettlements. In most cases, the projects have been rejected by the people. This is so because the people have not been involved in the execution of the project.

Therefore, the first system will be considered by the scheme. Because the system is appropriate for the people who have already received their own compensation and whose individual need might differ apart from basic needs. The design of the houses will be interpreted to the people by the experts who will also help in setting the building plan for them. According to J.A. Murray:-

---

1. J.F.C. Turner 1971.

"In mass housing design there must be continued co-operation between those who design and those who build(2)

It is fortunate that no building development is allowed to go on without approved and certified plans by Kano State Sanitation environment planning Authority (KASSEPA). This planning authority not only approves plans but goes around to supervise their erection. Therefore KASSEPA will thus be charged with the responsibility of supervising building on this site.

7.3 Project Finance and Implementation

Project of this kind can hardly be solely taken by government alone, but in line with the new national policy of site and services in the country. The state government will provide the basic infrastructures like major roads, drainage pattern, main water and electricity, services lines and communual facilities. While Kabo local government will provide the land.

The minimum that can be build out of the housing units consist of the Zaure, the compound

---

2. James A. Murray (1962) Architecture of housing.

head room at least one wife's room and the utilities. To make the house adoptable to one's needs the Kano state Sanitation environmental planning authority should make the layout of the plots with the position of the entrances. Theninterprete the design to the people and let them make their decision as to whether to accept completely the design or make alterations to suite their needs but has to conform with regulation of master plan.

7.4 Summary and Conclusion

This thesis aimed at proposing a resettlement of the displaced people giving them hibitation that respect their tradition, culture and architecture. To achieve this proposal all along had the house user in mind with string of wants, need and capabilities in aiding him to acquire a house that respect his culture and architecture.

An indebt analysis of Gude Village was carried out in which the nature of the layout, demographic and economic characteristic were studied. The existing facilities and amenities were also analysed. Various residential compounds were documented so as to understand

their various planning concepts such as the spatial organization of spaces, functionality etc.

In order to understand the concept of resettlement schemes, an appraisal of some selected scheme was carried out so as to evaluate the merits and demerits of such resettlement schemes. Typical examples are: the Kainji Resettlement, the Tema Resettlement in Ghana and the Ushafa scheme at Abuja.

To provide a valid, meaningful and realistic proposal for the resettlement of Gude village, a thorough analysis of the site was carried out. Infact, the selected site was done by the government officials in conjunction with village representatives.

The lay out will be developed at two levels, the Macro level and Micro level. The macro level in the first phase would be made up of land plots, unsurfaced access road, drainage, water supply and refuse collection.

During the second phase provision of electricity, school, dispensary, market, motor park and other public utilities will be provided

At the micro level the housing units begin with at least the compound wall and the basic components of the house and then mature to meet the requirement of the inhabitants.

Finally, it is pertinent to say that, since resettlement projects affect the entire life-style of the people, their involvement or participation is indespensible for the success of the programme.

BIBLIOGRAPHY

1 Atkinson F. (1982) Caring for people resettlement Abuja Capital City Territory.

2 Bello M.M. (1986), Yahawaki Redevelopment Scheme, Kano Unpublished M.Sc. Arch. Thesis, Ahmadu Bello University, Zaria.

3 Danladi M. (1985), Yamattu Resettlement Scheme. Unpublished M.Sc. Arch Thesis, Ahmadu Bello University, Zaria.

4 Dokaji A.A. (1958), Kano Ta Dabo Cigari

5 Madusalumo U. D. (1986), Dou-beli Redevelopment Scheme, Jimeta, Unpublished M.Sc. Arch Thesis Ahmadu Bello University, Zaria.

6 Omusa N.M. (1986), Ushafo Resettlement Scheme, Unpublished M.Sc. Arch. thesis, Ahmadu Bello University, Zaria.

7 Paul, D.S. (1965),The Architecture of Towns and Cities.

8 Paul, Oliver (1971), Shelter in Africa.

9 Rappaport Amos(1969), House formand culture

10 Rappaport Amos (1977), Human Aspect of Urban Form towards man environment to urban form design programme press New York.

11 Reme E.Y. Heraide Rural Resslement in Agricultural world conditions (New York UN. Publication)

12 Sa'ad H.T. (1981) Between Myth and Reality, Unpublished Ph. Thesis.

13 Sa'ad H.T. (1974) Resettling the Jarawa people. unpulished (M.Sc.) Thesis, Ahmadu Bello University, Zaria.

14 Schwerdtfeger,F.W. (1982), Copyright, Traditional Housing in African cities.

15 Shua'ib, I.M. (1983), Crital Evaluation of Selected Development projected initiated by Resettlement Scheme in Nigeria. Unpublished M.Sc.(U.R.P.) Thesis Ahmadu Bello University, Zaria.

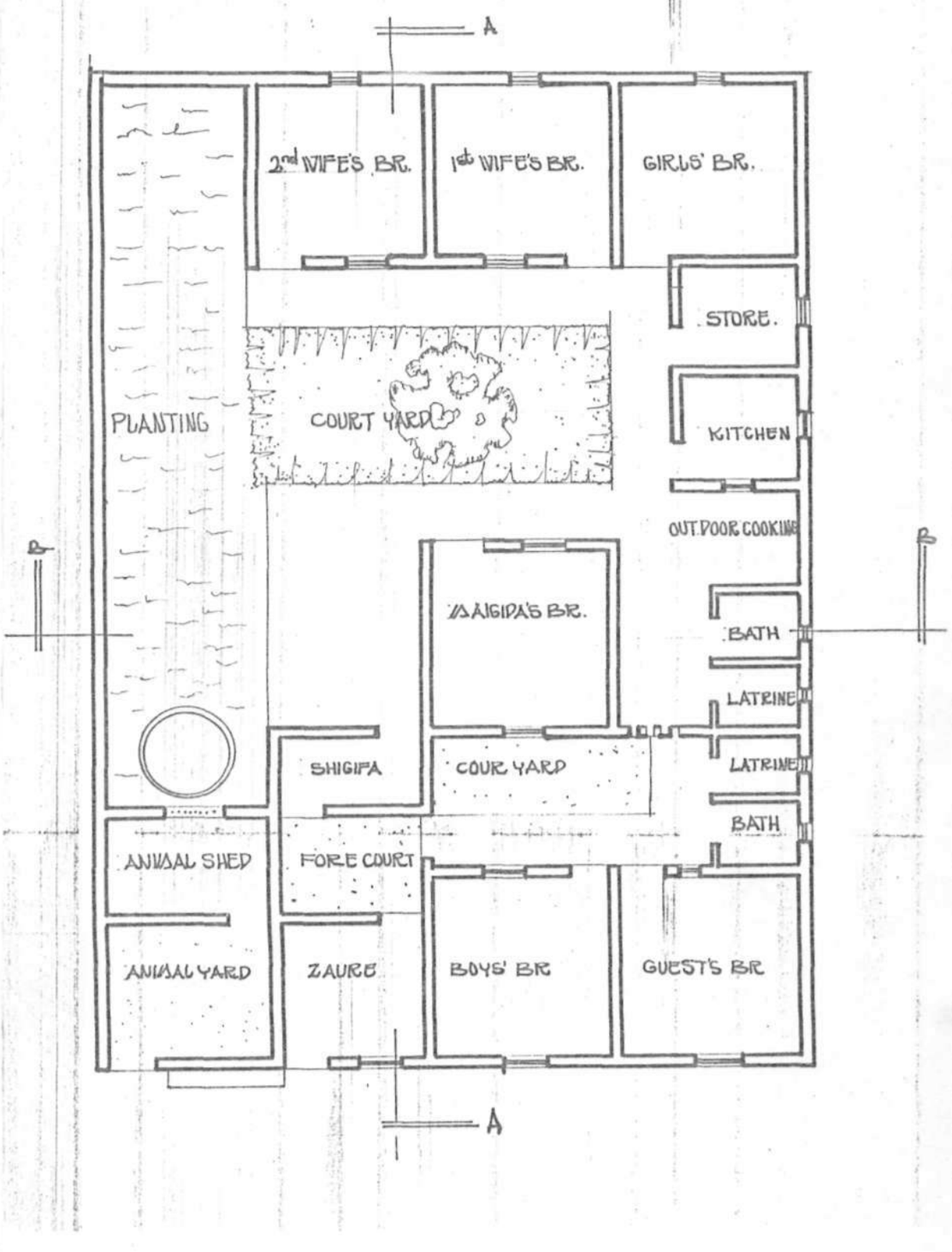
16 Susan Denyer (1971), African Tradition Architecture Heinemann.

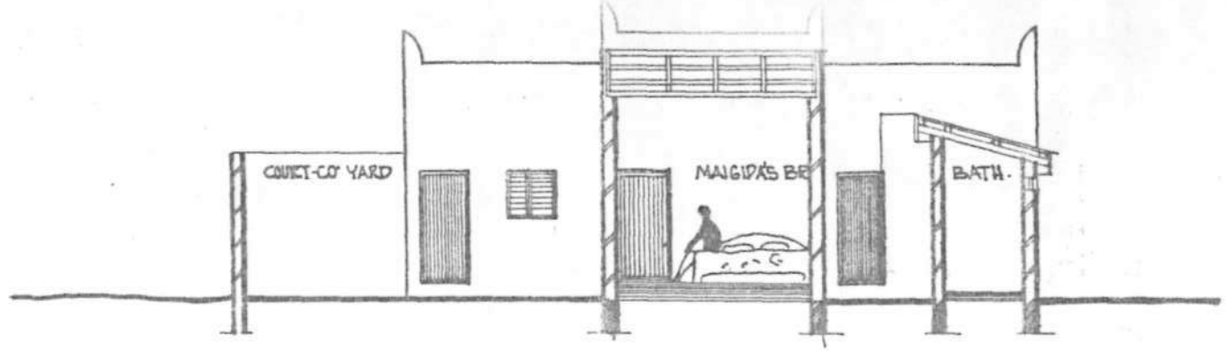
17 Travallion B.A.W. (1963),Metropolitan Kano.

18 Umar,G.B. (1987), Housing for sub-sahara Hausaland, Unpublished M.Sc. Arch Thesis,Ahmadu Bello University, Zaria.

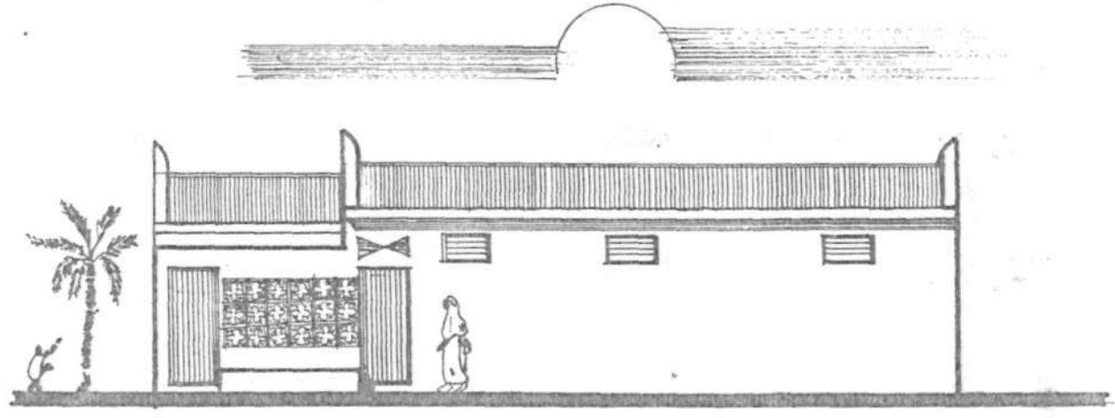
19 Temlong N (1986), Sabo Gida Resettlement Scheme (An Exposition of Tarok Traditional Architecture), Unpublished (M.Sc.) Thesis, Ahmadu Bello University, Zaria.

PRIMARY NUCLEAR FAMILY



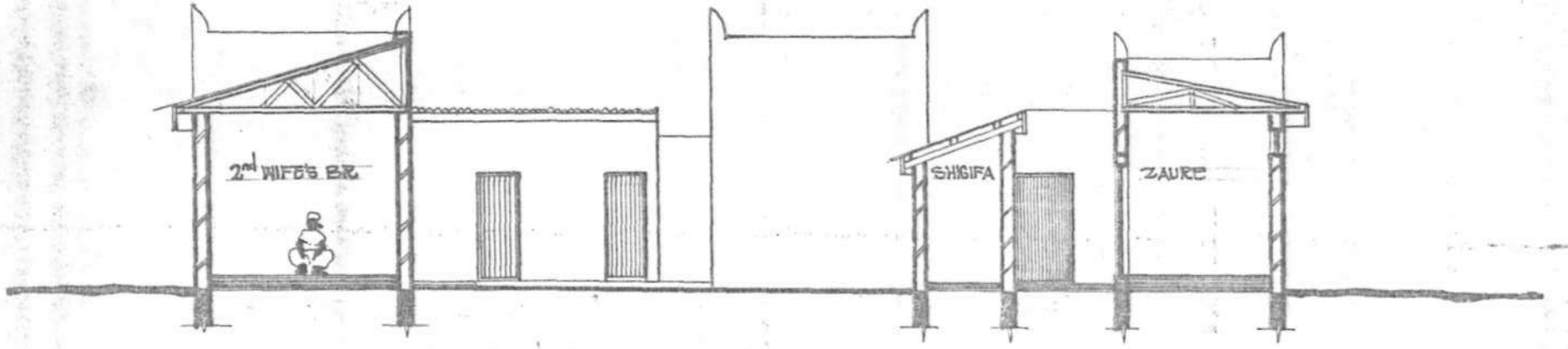


SECTION B-B

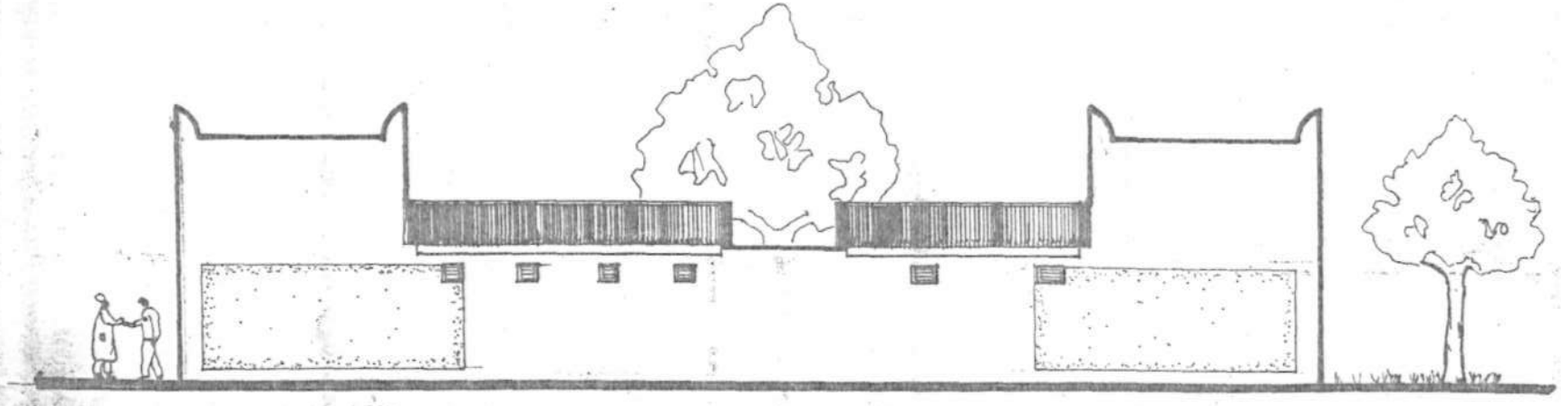


FRONT ELEVATION.

NAME	SALISU A.A.
MENTO	ARC M.D AHMAD
SCHOOL	ABU ZARIA
SCALE	1:100

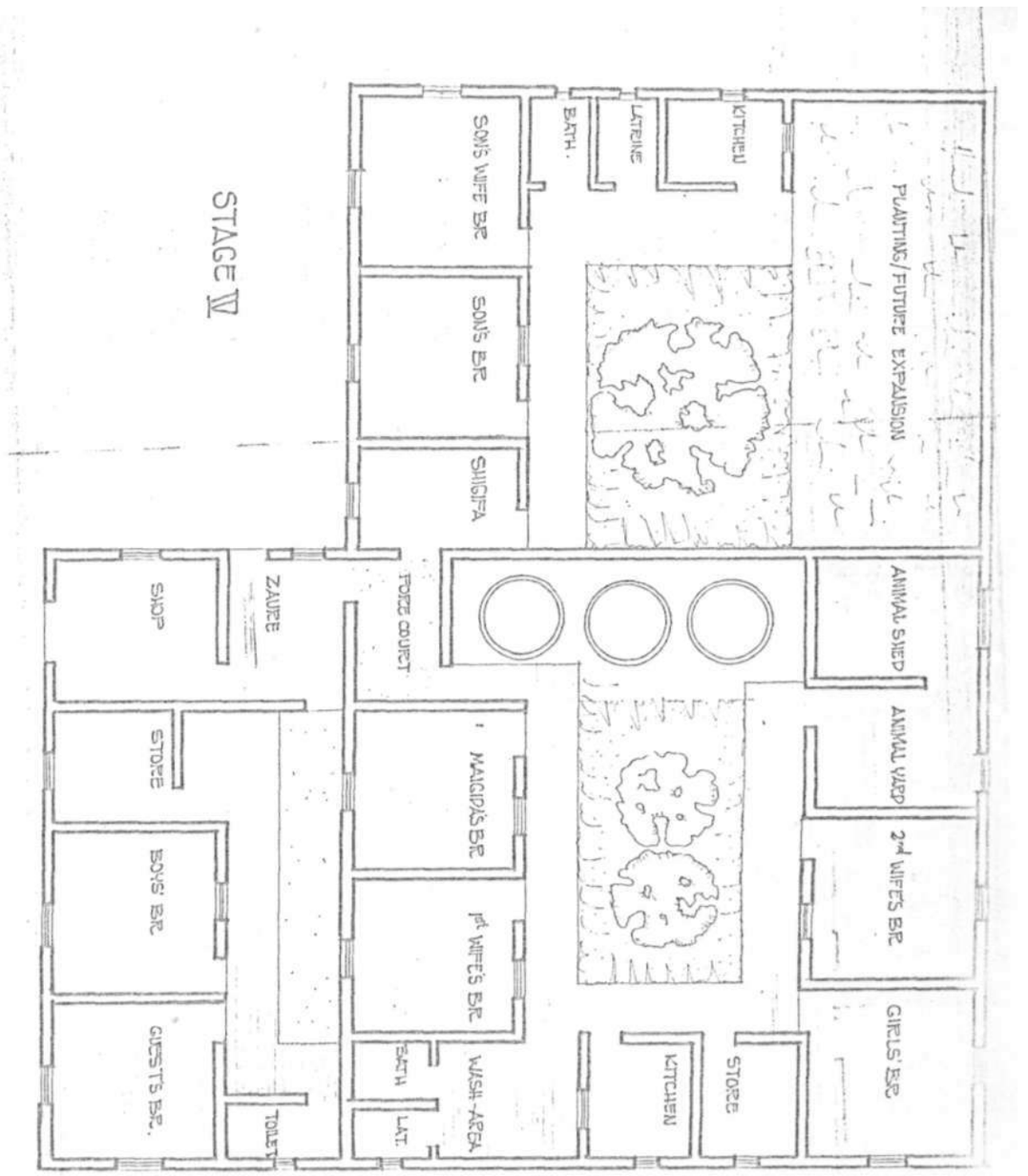


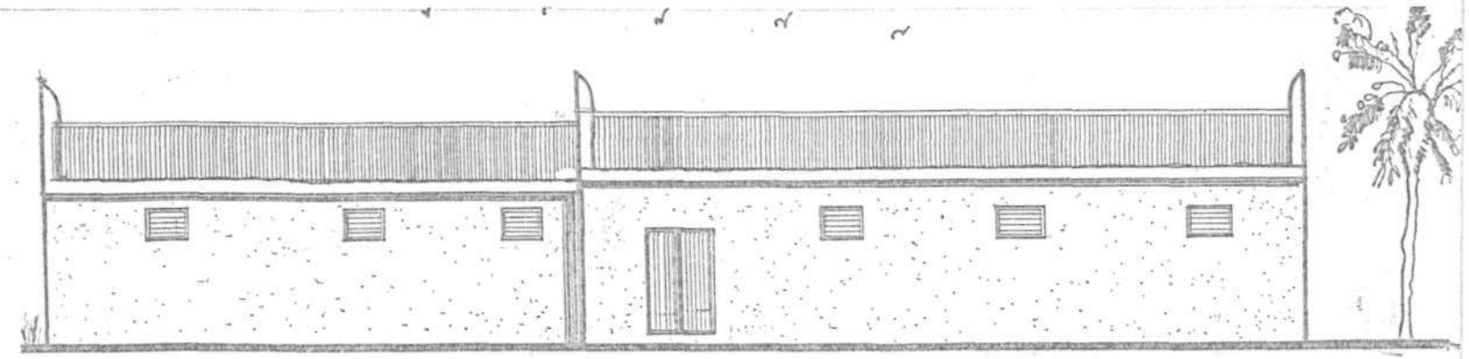
SECTION A-A



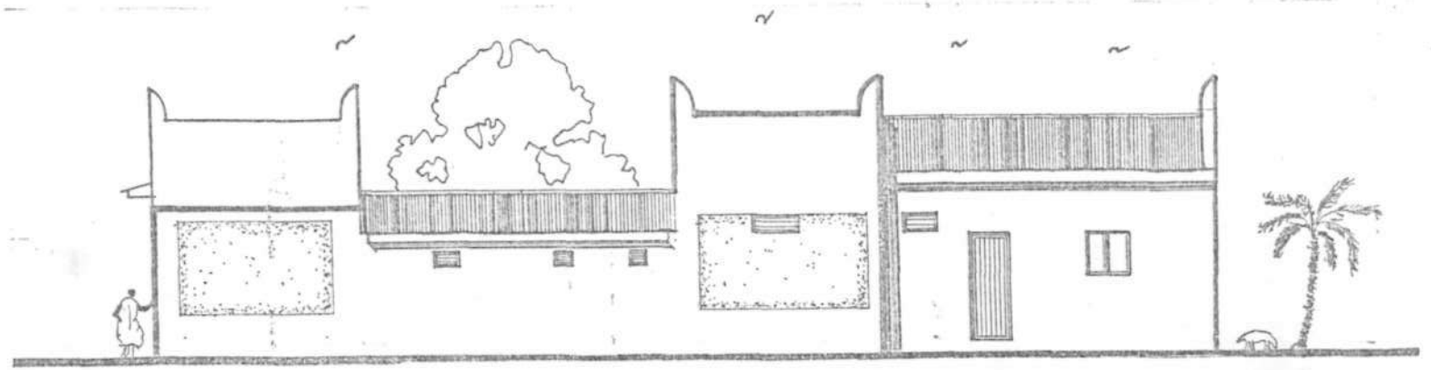
SIDE ELEVATION (EAST).

PRIMARY EXTENDED FAMILY

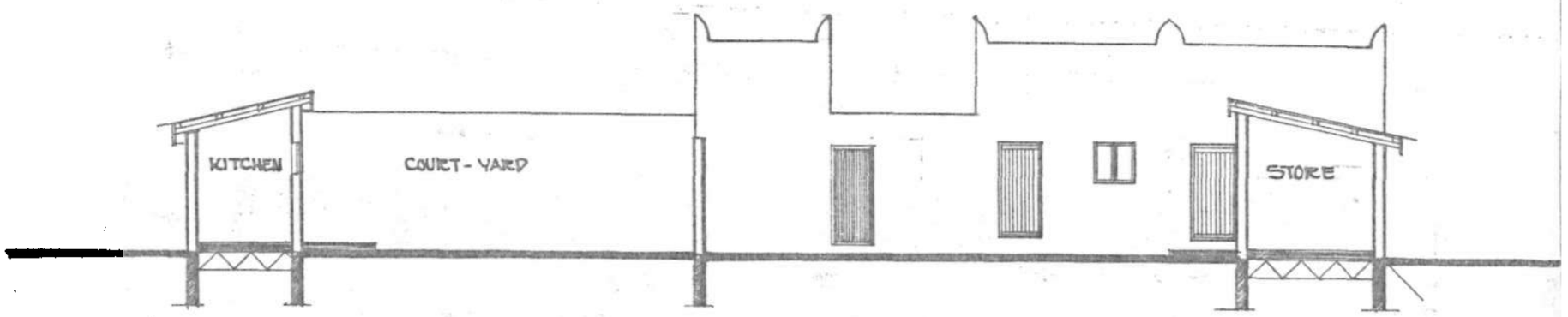




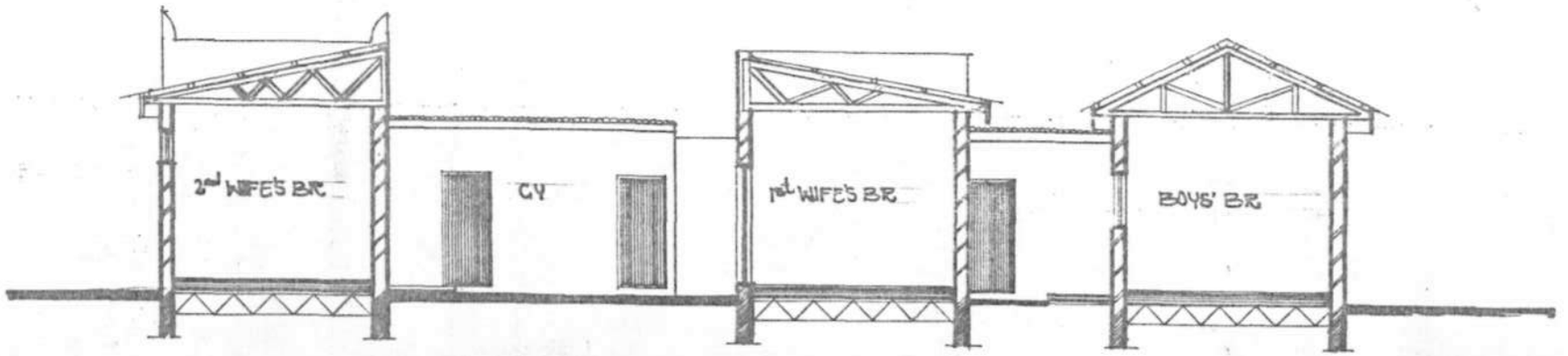
FRONT ELEVATION.



SIDE ELEVATION (WEST)

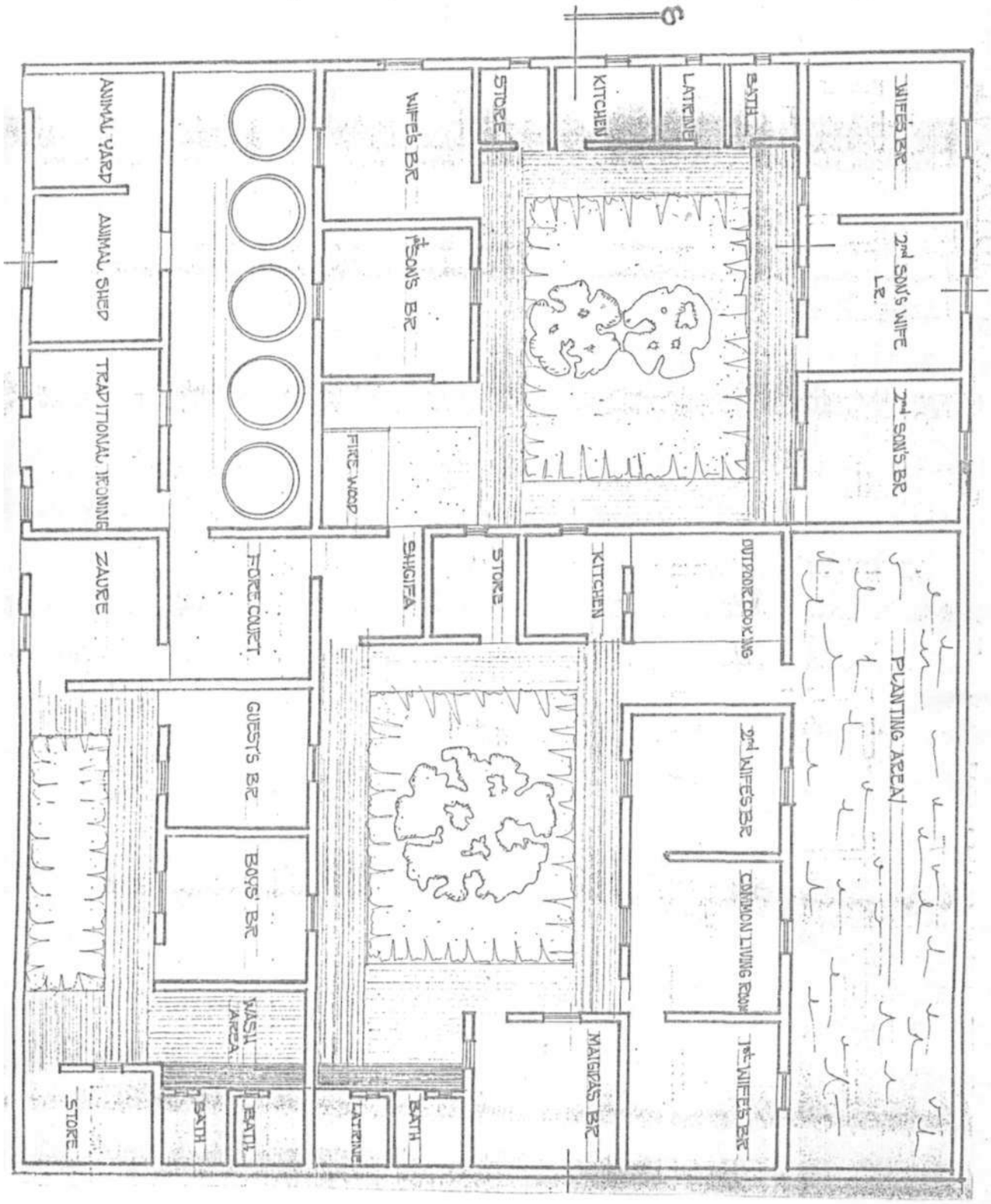


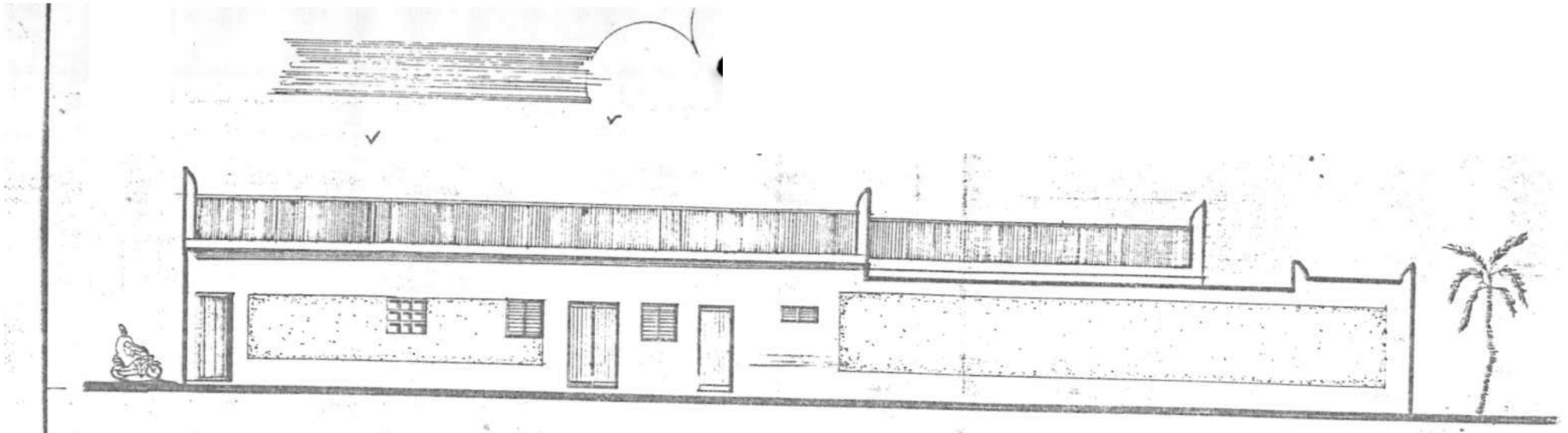
SECTION C-C



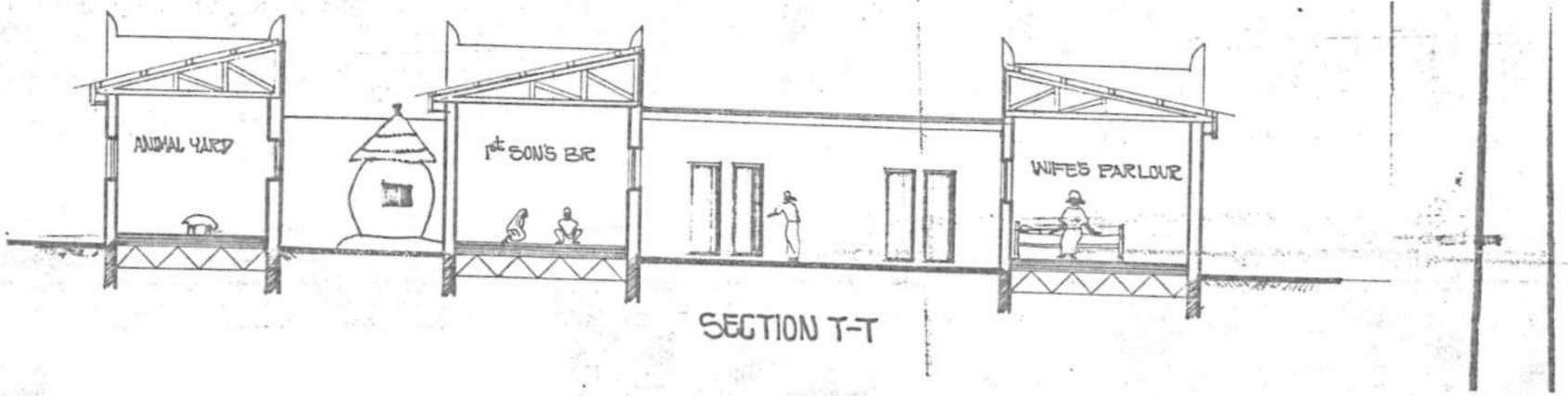
SECTION D-D

SECONDARY EXTENDED FAMILY

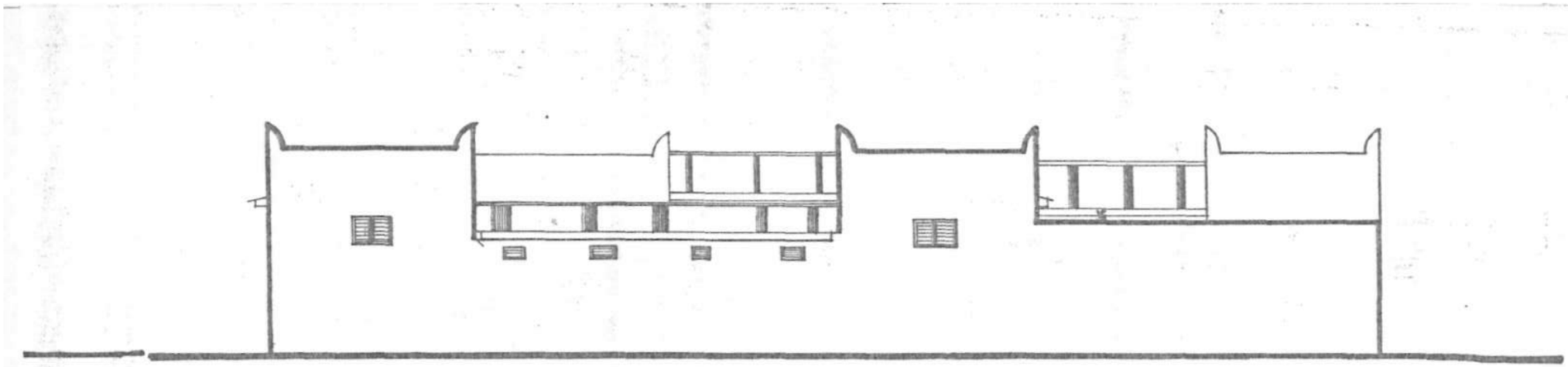




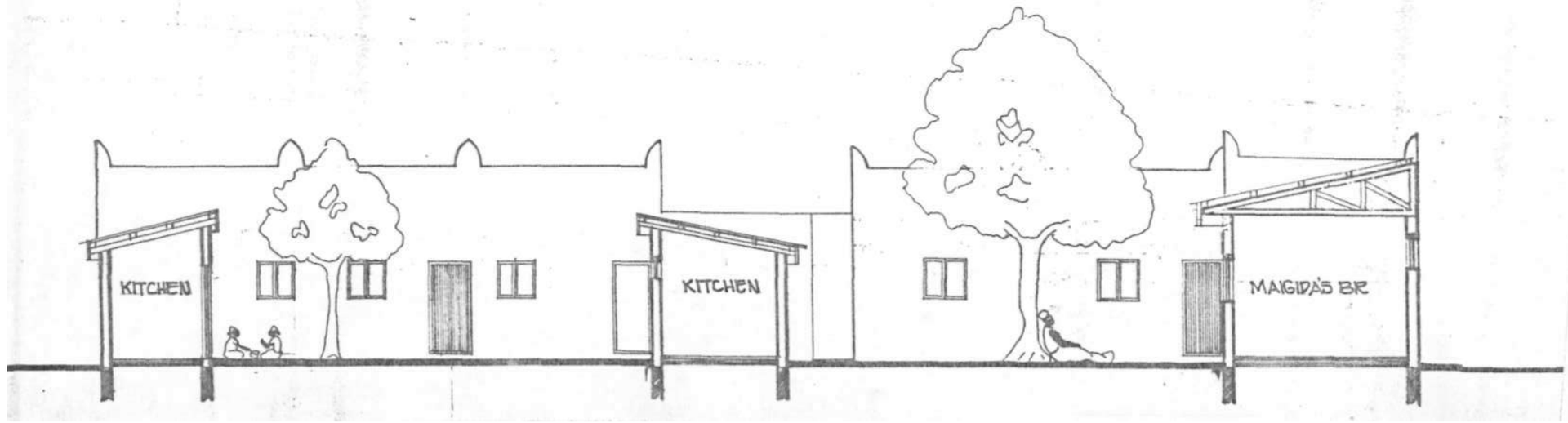
FRONT ELEVATION



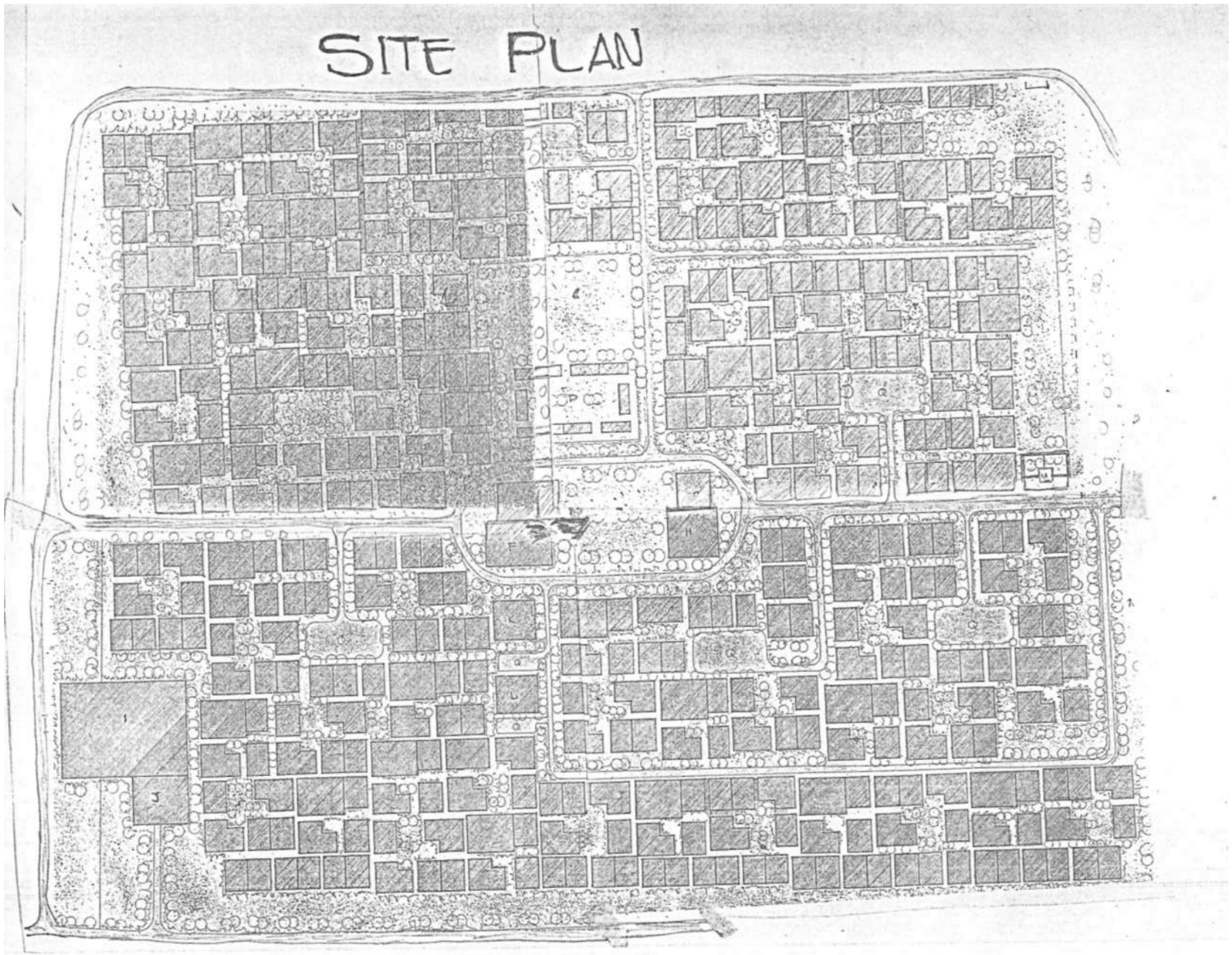
SECTION T-T



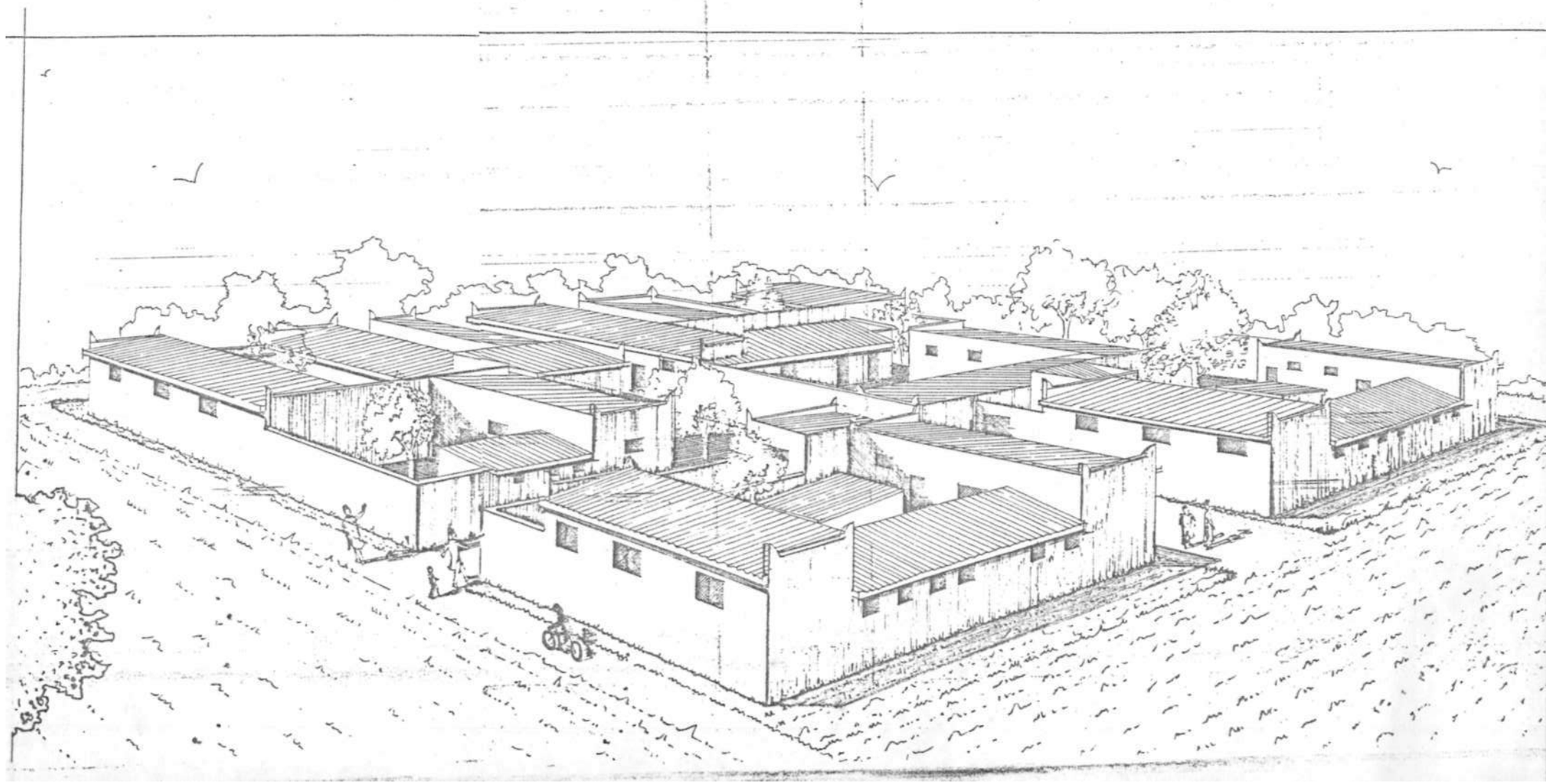
SIDE ELEVATIO (WEST)



SITE PLAN

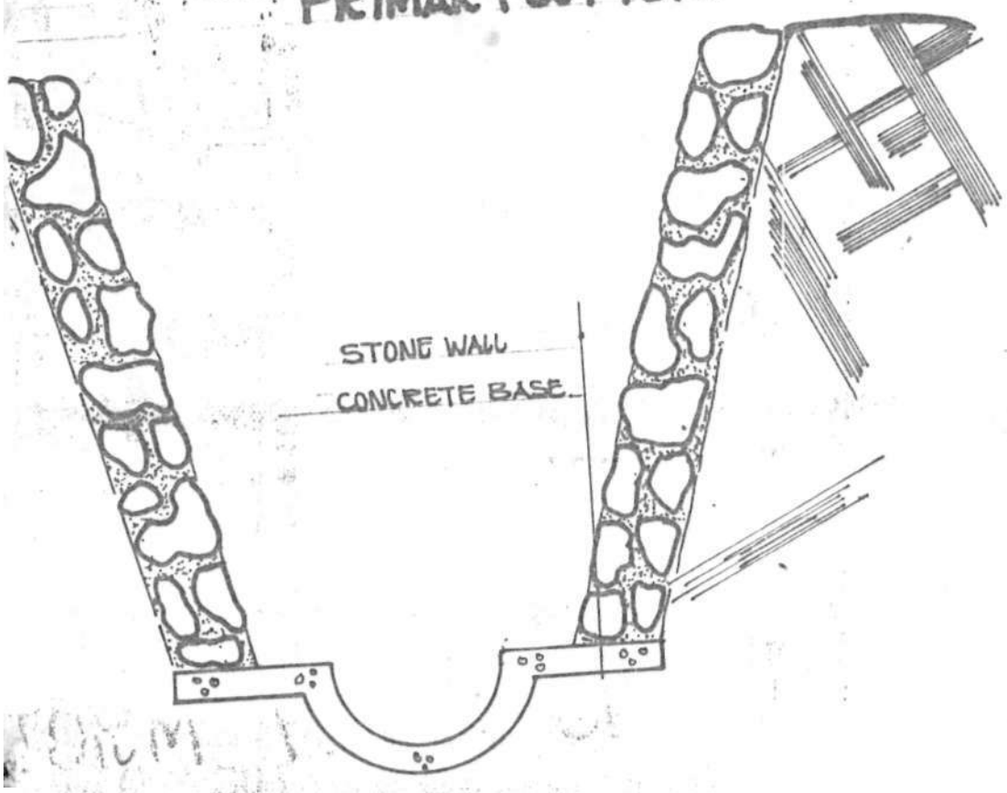


AERIAL CLUSTER PERSPECTIVE

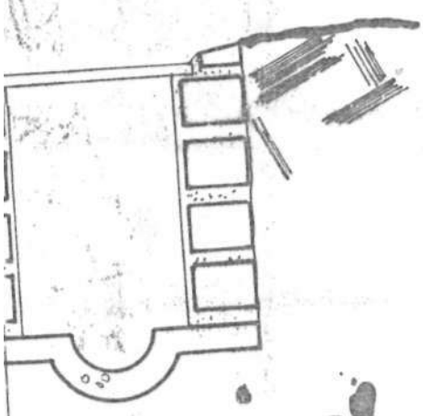


STORM WATER GUTTER.

PRIMARY GUTTER.



ONDARY GUTTER



TERTIARY GUTTER

