WOMEN VOCATIONAL TRAINING CENTRE KACHIA

(Design for effective learning spaces

By

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DECLARATION

I, Gaiya Boyle Malachy solemnly declare that this thesis is a report of my original research work and was written by me. To the best of my knowledge, it has not been presented elsewhere for the award of a degree.

Gaiya Boyle Malachy

CERTIFICATION

This thesis entitled "Women Vocational Training Centre Kachia" by Gaiya Boyle Malachy meets the regulations governing the award of the degree of Masters of Science in Architecture of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to CHRIST, the Architect of my creation. Also dedicated to my aged parents Mr. Gaiya La'ah Gado and Mrs. Basang Gaiya. My sisters, Mrs. Baita Buki, Mrs. Juliana Usman and my brothers, Mr. Patrick, Vincent, Late Paul and John Gaiya (May their souls rest in CHRIST - Amen).

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I am also indebted to the following:

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- Kaduna State Urban Planning and Development Authority, Area Office, Kachia.
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Trully, all families consist in God, for how can I explain the financial support of Mrs. Juliana L. Usman, Mr. Vincent Gaiya, Mr. Joseph Dabo, Cletus Mugu and others? My thank goes to other members of the family who contributed either directly or indirectly for my success. I especially thank my nephew Henry Usman and nieces, Miss Rose, Rita, Ketura, Swanduniyio Usman and Swanduniyio Patrick for their fervent prayers unto God almighty to see me through this thesis.

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Last but not the least, I express my profound gratitude to God almighty for the knowledge, assistance and health given me during the course of my study.

Apprenticeship training in many vocations started long ago before the coming of the whiteman. This was accepted as part of a wider education process in which the indigenous societies passed on their cultural heritage from one generation to the other. These vocations such as farming, local crafts, traditional dances, local industries etc were non-exception of Kachia. These not only serve as cultural heritage but as a means of livelihood to the rural populace.

Thus, this thesis "Women Vocational Training Centre" is basically and essentially a study of local crafts, local traditional learning spaces limited to Kachia and modern learning spaces with the aim of developing a design with effective spaces. The problem with vocational training institutions has always been that of rationalising spaces for the diverse activities taking place almost simultaneously thus satisfying the users's needs, in terms of space, comfort privacy etc. These will therefore be the main focus of this thesis.

In scope, the centre will comprise of an administrative building for the purpose of administering its activities, a multi-purpose hall for indoor assemblies, seminar and symposia presentations, dramas etc, workshops/classrooms for the crafts and Home Economics, a recreational yard (or amphitheatre

for traditional dances and dramas by the women) as means of attracting them to the centre's activities library and saleshop for students' projects.

The project site is Kachia in southern part of Kaduna State, a major local crafts production area by the rural women. It is therefore, the hope of the author that the state government, local government, women community programme development and private philanthropic individuals will join hands in making this centre a reality.

TABLE OF CONTENTS

	Pages
Title Page.....	i
Declaration.....	ii
Certification.....	iii
Dedication.....	iv
Acknowledgement.....	v
Abstract	vi
Table of Contents	ix
List of Figures.....	xii
Bibliography.....	70

CHAPTER ONE

1.0	INTRODUCTION.	1
1.1	Motivations	1
1.2	Justification	2
1.3	Definition of Vocational Education	3
1.4	Aims and Objectives	4
1.5	Scope and Limitations	5
1.6	Constraints	5
1.7	Research Methodology	5

CHAPTER TWO

2.0	LOCAL CRAFTS IN KACHIA	7
2.1	Definition of Crafts	7
2.2	Brief	7

		Pages
2.3	Types of Crafts	8
2.4	Prospects of Local Crafts	17
2.5	Traditional Method of Learning	18
	CHAPTER THREE	
3.0	DESIGN GUIDES FOR VOCATIONAL INSTITUTIONS	21
3.1	Site Selection Procedure	21
3.2	Site Planning Principles	22
3.3	Design Guide for Workshops	23
3.4	New Teaching Techniques	30
	CHAPTER FOUR	
4.0	CASE STUDIES	33
4.1	'ECWA WIDOWS' Training Centre Samaru Kataf	33
4.2	Jacaranda Pottery Centre Kaduna	36
4.3	School of Home Economics Kaduna	38
4.4	Henderson/Decatur and Wayne County Vocational Centres	40
	CHAPTER FIVE	
5.0	THE SITE	43
5.1	Kachia	43
5.2	Natural and Physical Characteristics	45
5.3	Climatic Elements	53
5.4	Site.	54

Pages

CHAPTER SIX

6.0	ARCHITECTURE IN NIGERIA	50
6.1	Traditional Architecture	50
6.2	Vernacular Architecture	52
6.3	Modern Architecture	53
6.4	Architecture in Kachia	53
6.5	Search for Identity	55

CHAPTER SEVEN

7.0	THE DESIGN ANALYSIS	56
7.1	Brief and Design Scope	56
7.2	Functional Relationships	58
7.3	Conceptual Analysis	58
7.4	Schedule of Accommodation and Functional Space Requirement.	60

CHAPTER EIGHT

8.0	THE DESIGN REPORT	65
8.1	Site Planning	65
8.2	Design	66
8.3	Services	67
8.4	Construction	67
8.5	Landscape	67
	Summary	69
	Conclusion	69

LIST OF FIGURES

Figures

1. Spinning of cotton
2(a) A weaver on a vertical loom
2(b) A weaver on a counter balance loom
3. Printing on local textile cloth
4(a) Pot-modelling-sitting position
4(b) Pot-modelling-sitting position
4(c) Pot-modelling-stooping position
5. Firing of pots
6. Basket weaving
7. Mat weaving
8. ECWA Windows' Training Centre Samaru Kataf
9. Jacaranda pottery centre Kaduna
10. School of Home Economics Kaduna
11(a) Map of Nigeria showing Kaduna State
11(b) Map of Kaduna showing Kachia
12(a) Chart showing annual rainfall of Kachia
12(b) Chart showing annual temperature of Kachia
13(a) Chart showing annual windspeed of Kachia
13(b) Chart showing annual Relative Humidity of Kachia.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Motivation

Apprenticeship in many vocations started long before the coming of the whiteman. This was accepted as part of a wider education process in which the indigenous societies passed on their cultural heritage from one generation to the other. In Kachia, these vocations included farming, local crafts, local industries, traditional dances etc. Kachia which lies within a predominantly agricultural region, is fortunate to have some of the potentials for these vocations which have over the years not been tapped with arrival of industrialization. Industrialization does not only render the worth of local crafts in Kachia useless but also contributes towards joblessness of its engagers i.e. the women.

Today, the practice of local crafts in Kachia is gradually been phased out as one hardly finds a single centre within the settlement where the skill is being communicated to others. This therefore, explains the rapidity with which local crafts in Kachia are fast dying which are meant to be preserved as cultural heritage. This forces some women in Kachia to resolve to farming like their male counterparts which is not meant for them by tradition.

Also, the importance of local crafts in our societies cannot be over-emphasized since among other things, they provide a mean of livelihood to the women. These products are not abstract things but things that can be put to physical use. They are in high demand in Nigeria by the average and poor Nigerians now that Nigeria is presently undergoing a period of staging inflation due to Structural Adjustment Programme (SAP). The Government is also campaigning for self-reliance, employment, eradication of illiteracy by the year 2000 A.C., better life for rural women etc. How then can these salient objectives be achieved?

1.2 Justifications

Efforts began in 1986 by the women education unit of the ministry of education, when in 27th November, 1986, the first national launching of the women federation was held and signal steps were taken on the need to mobilize and educate the rural women. Campaigns were launched at both State and local government levels for the purpose of effective mobilization and monitoring of the rural women in Nigeria.

Based on this, the country was divided and grouped into the following zones:

(i) Bendel and Ondo State

(ii) Akwa-Ibom, Cross-Rivers and Rivers State

(iii) FCT, Abuja, Kwara and Niger State

(iv) Bauchi, Kano and Plateau State

(v) Anambra, Benue and Imo State

(vi) Kaduna, Katsina and Sokoto State

(vii) Borno and Gongola State

(viii) Lagos, Ogun and Oyo State.

The women education unit, in collaboration with the ministries of education of each zone and the corresponding local government areas, organized zonal workshops and market rallies in each State capital and two rural areas of each State which afforded the staff of the ministry the opportunity to go round the country identifying the education needs of the rural women taking due cognisance of the diverse and rich cultural backgrounds and heritage. The needs identified during the zonal workshop were tabled for deliberations and as a result of the zonal activities, women Education Centres, multi-purpose women vocational institutions and women adult literacy classes through the help of cooperation of voluntary women organisations, local government areas or philanthropic individuals were established in some States of the country.

1.3 Definitions of Vocational Education

Vocational Education as stated in the national policy for Education states that, "Is an aspect of training which leads to the acquisition of practical and applied skill".

The American Vocational Association Committee on Research and publications states that:

> "Is that aspect of training designed to develop skills, abilities, understanding, attitudes, work habits and appreciations, encompassing knowledge and information needed by workers to enter and make progress in employment on useful and productive basis. It is an integral part of the total education program and contributes towards the development of good citizens by developing their physical, social, civic, cultural and economic compentencies".

1.4 Aims and Objectives

In response to the above, this thesis aims at the following:

- Creating jobs and business opportunities for Kachia rural women in local crafts after training.
- Promotion of social and cultural interaction and harmony among the rural women.
- Creating a much more convenient space for learning.

The above aims could be achieved through the following architectural objectives:

- Provision of a well designed educational, social and recreational facilities for the women.

- A comfortable designed spaces for various activities to enhance users requirements, physical and psychological well-being.
- A stimulating architectural planning and forms to draw the women to the centre.

1.5 Scope and Limitation

The scope of the centre will be limited to an administrative building, a multi-purpose hall, women recreational courtyard for dramas and cultural dances promotion and crafts units.

1.6 Constraints

There were a number of obstacles faced during the research. The main obstacle was lack of recent demorgraphic data on Kachia which would have aided me in proposing the population to be accommodated into the centre. This made me to estimate based on the range proposed by the National Board for Technical and Vocational Education.

Most of the work like space requirements had to be work out from first principles since there was lack of architectural procedence set by architects.

1.7 Research Methodology

The research methodology selected for this project is based on the analysis of the followings:

CHAPTER TWO

2.0 LOCAL CRAFTS IN KACHIA

2.1 Definition

Crafts can be defined as, manual skill, trade, an occupation, or a special skill in the execution of manual art or handwork . The word handicraft can also be defined as useful or decorative object made by hand or with tools by a workman who has direct control over the product during all stages of production. It also indicates methods of production .

2.2 Brief

African women play a major role in craft production. In nearly every ethnic group south of Sahara, women work as artists in addition to carrying out their domestic activities. The crafts they produce demonstrate broad range of media including pottery, textile weaving, embroidery, carving, leather work, painting, cloth dying, calabash decoration, mat and basket weaving.

In Kachia these are exclusive of men who are supposed to be sole farmers too. These crafts therefore, maintain separate spheres of activities, and through boundaries that women impose on them these spheres are left divided from the men crafts which include wood carving and metal work.

In this chapter only those crafts found in Kachia will be discussed.

2.3 Types of Crafts

2.3.1 Local Textile Weaving

Background

The evolution of textile weaving in Nigeria can be traced back through archaeological discoveries in Eastern Nigeria of local textiles over a thousand years old, woven from bast and leaft fibres. Bast fibres were probably used first and then cotton. Whether weaving with each was done simultaneously is difficult to document without further evidence. Written evidence indicates that the Northern emirate of Kano had a reputation for the skill of its weavers as nearly as 1512.

In Western Nigeria, the Yoruba have long had a reputation for their weaving and ample use of hand woven fabric for their own clothing. One observer in the 1890s once said, "The Yoruba is by custom a fully clothed motal. It is considered in the highest degree unfashionable to appear in the streets without a complete covering of two or three ample and well dyed cloths, drapped round the body in not ungraceful folds".

Different types of weaving techniques have been developed and only those commonly used by women in Kachia will be discussed.

Vertical Loom

The vertical loom has a fixed frame, a heddle stick and no treadles. It is less sophisticated technologically than the treadle loom, and just as in the case of the treadle loom, there are variations in structural details. A rectangular frame in an upright position is always used, and the warp or threads are manipulated manually by heddle sticks. The weaver wraps the warp thread around the top cross beam and the lower cross piece of the frame. While working, the weaver keeps the work at approximately chest level by shifting the cloth down and around the cross beams as it is woven, until the starting point is reached again. When completed, the length of the cloth is twice the height of the loom and no wider than the cross beam of the frame.

It was learned that the size of the loom varies according to geographical location, but each of the variations has approximately the same basic apparatus as described above. The textile woven on these looms varies in width from twenty inches to forty-eight inches and in length from four to six feet. The vertical loom is used by women and also training beginners. (see fig.....).

Treadle loom

Generally, the treadle loom is constructed with a rectangular wooden framework which supports the reed and two heddles with a roller or pulley for storage at

the back of the loom and another roller in front for the warp (or thread) and the woven fabric storage respectively. These rollers are therefore called beams.

The warps pass from the warp beam, up over the back beam and is stretched across a distance of four feet to the front beam, over it and down to the cloth roller for rolling the woven fabric which is placed underneath the weaver's knees for convenience.

The warp is held in tension by cranking up the ratchets on both warp and cloth rollers so that the warp is stretched in opposite directions. The principles and weaving of a treadle looms are the same as those of the simple vertical loom. The major difference is speed.

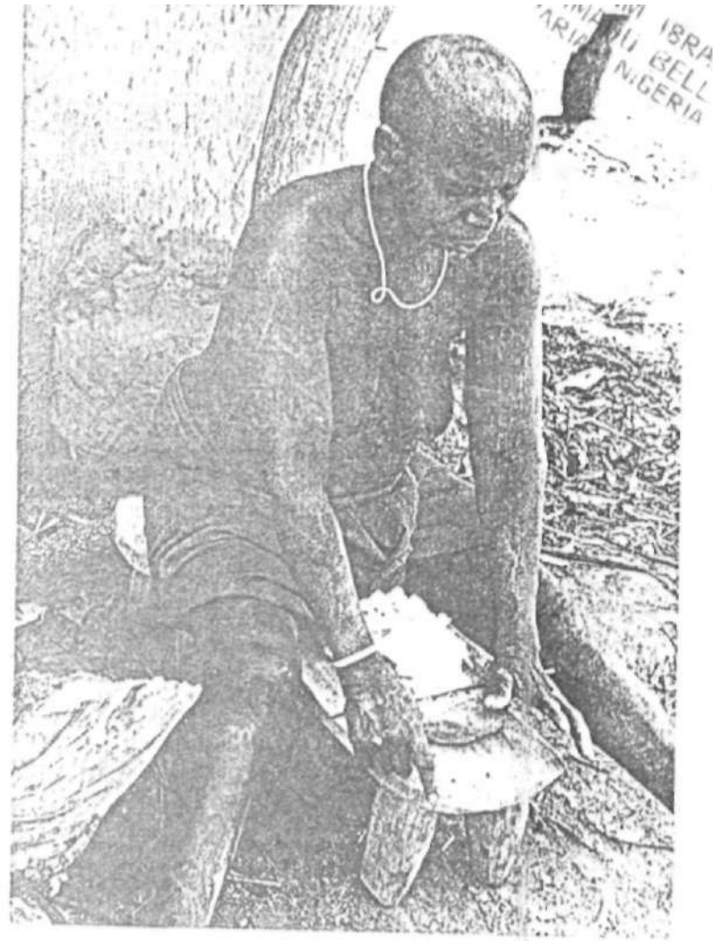
Textile decorating

Among the more frequently used indigenous dyes found in Kachia are the varieties of indigo which grow wild but sometime cultivated. Either way, the grow easily and the dyers never lack a source for natural indigo dye. These indigo plants include Indigofera tinctoria, Indigofera arrecta, Indigofera suffricotosa, etc.

Decoration on textile cloths are made either by pre-dying the threads or by local printing technique using carved pieces of calabash, stamping etc.

Over the years decorations on textile cloths are designs that have intrinsic values and meanings. The symbolic use of pattern like zigzag might suggest lighting,

Fig. 1 spinning



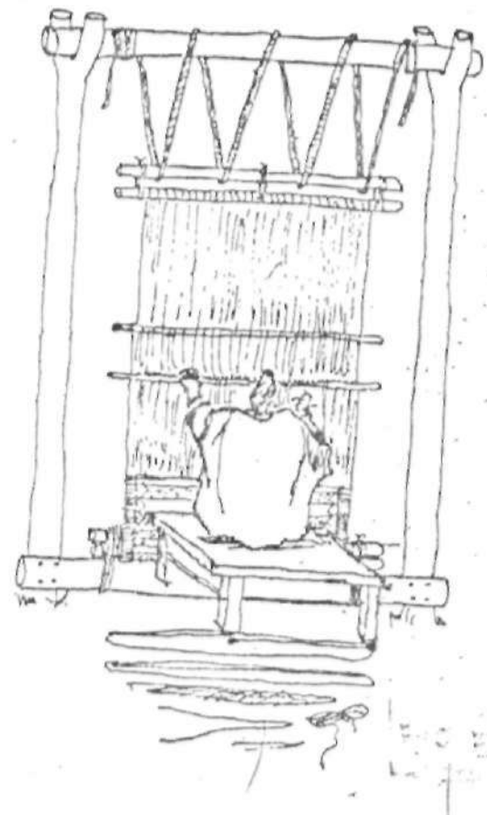
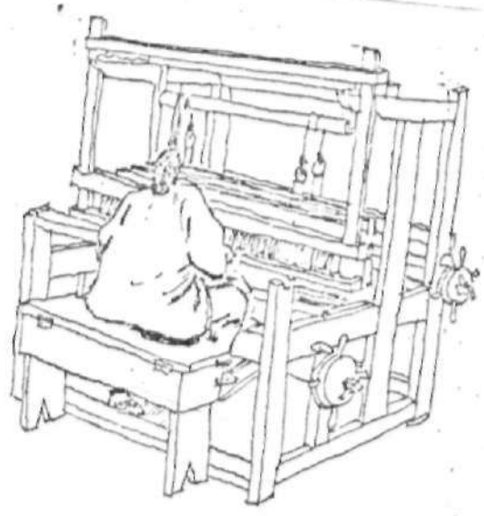


Fig 2(a) shows a WEAVER ON THE VERTICAL LOOM



Fig(b) show A WEAVER ON MODERN COUNTER BALANCE LOOM,

Fig. 3 cLoth PRINTING



snakes, water, fire or the name of an antelope. A circled dot often refers to the sun as a source of great vitality.

2.3.2. Pottery

Background

Pottery is also considered as one of the earliest crafts, certainly dating back to Africa's neolithic period when man used polished stone as tools. It was discovered in the sixth mellenium B.C. (information revealed) in the middle of Jericho in Palestine and spread to parts of North Africa. South of Sahara the earliest pottery found dates back to the fourth mellenium B.C.

People of the Nok around Kachia created sculpture of nearly life size. This, therefore, form the origin of pottery in Kachia.

Materials and Properties

The materials for pottery making is called clay found commonly by river banks, banks of lakes and ponds. Clay is sticky, greasy, and sandy and its colour can be black, grey or brown-red.

No clay is usable immediately after been dug up, although clay that has been dredged from the above sources needs little preparation. Clay dug from deeper grounds needs more preparation. The clay is soaked in

trough with water and the waste that rises to the surface is filtered off. Sometimes it is stirred up before sieving with a thresh. Most clay used in Africa is terracotta - a low fire clay rich in iron.

It is not uncommon seeing clay spread out on the ground or in a shallow trough, and exposed to weather. Weather breaks down small lumps and ages the clay. Caly malleability improves with aging preparation is helped by pompelling or treading and rolling the clay. In Kachia the clay is dry, then pound it with a stick into a fine power, before mixing and kreading it with water.

Clay plasticity and malleability vary widely. Some clays are good for one process and not for another. Clays that are 'greasy' are prepared by mixing them with a bit of sand or finely crushed shards (grog-which is fire clay) or the more sticky clays can be mixed with others that are less greasy or more sandy.

Making of pots

Pottery production is common in Kachia area by the women. Two different techniques are involved in the making of pots. In each case, four stages are involved as follows; gathering of clay from clay reserves, building the pot, drying and firing. Investigation revealed that one method is used by local producers while the other method is used in training and commercial centres. In training centres, wheels are involved in the building of

pots, and firing. The local method can be explained as follows:

Gathering the clay involves digging it from the reserves mostly in riversides and drying it in the sun. The clay is broken to convenient sizes and put in containers with little water just sufficient enough to ensure slaking. When it has turned out into a loose and sloppy mass, it is mixed with some sand as reinforcement. The mixture is sieved with two grade thresh to remove the impurities and hard sand. This filtration is allowed to settle after two days. The clay is then tabled to allow the water to drain out after which the clay is put in pits dug inside the ground to preserve the moistness. At this stage, the clay is ready for building the pots. This preparation is common to the two techniques mentioned above. Only at the stage of building the pot do they vary.

In the local process, the potter places a lump of clay on a hallow stone and beats out a hallow in the middle with her hand. She then pulls the walls in a diagonal direction while she walks backwards around the pot. She continues to build the pot and when it is about two-third complete, she begins to add thick coils of clay pulling them upwards and thinning them with the same rythmic movement. The pot begins at this stage to take a spherical shape. She builds up the shoulder and neck and finally completes the upper part of the pot while the bottom is still untouched. The half

completed pot is dried slowly in the sun after which the bottom is done. See fig.....

In this local method, firing is done in the open-air without a kiln. It is often done collectively with other women, since the larger the quantities of unfired pots placed in the fire arena, the more effective the firing will be. When a sufficient quantity of pots have been pre-dried in the sun, they are carefully stacked one on top of another and then covered with broken pot sherds, palm founds and leafy twigs to help retain the heat being fired. Careful preperation is necessary to ensure that the temperature is kept under control, thus preventing them from cracking and exploding.

Learning in this method is acquired or done gradually through persistent trial and error and positive instruction.

Pottery Decorating

Pots usually have some sort of decoration that has a functional or symbolic effect. Designs usually are made by modelling clay embellishments and attaching them to the pot while clay is moist or by incising designs in leather hard clay; by impressing wet clay with pointed sticks or rough materials such as braids of straw; by applying coils, lumps or braids of clay when wet, by burnishing and polishing it; and more rarely now by painting uesigns using a brush or knife mixture of eath colours such as koalin and ocher with water or peanut it.

Fig 4 (a) POT MAKING - SITTING POSITION.

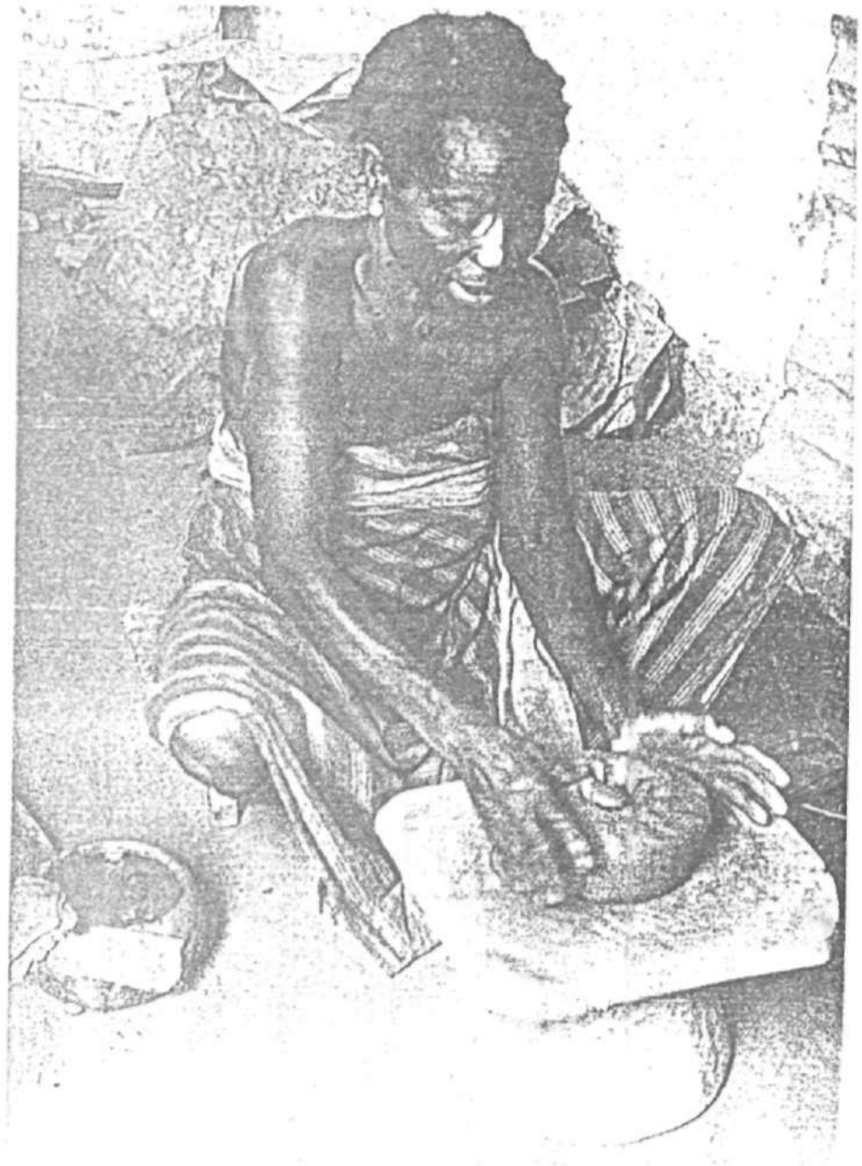


Fig 4(b) POTTERY - SITTING POSITION

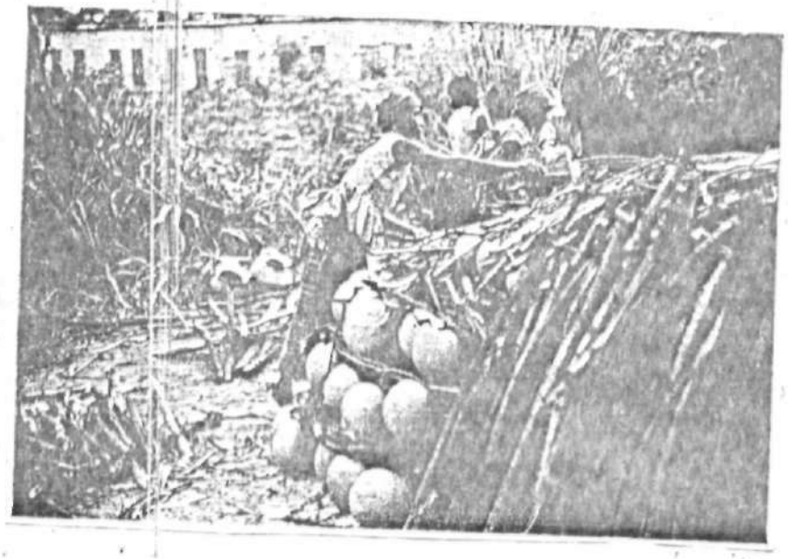


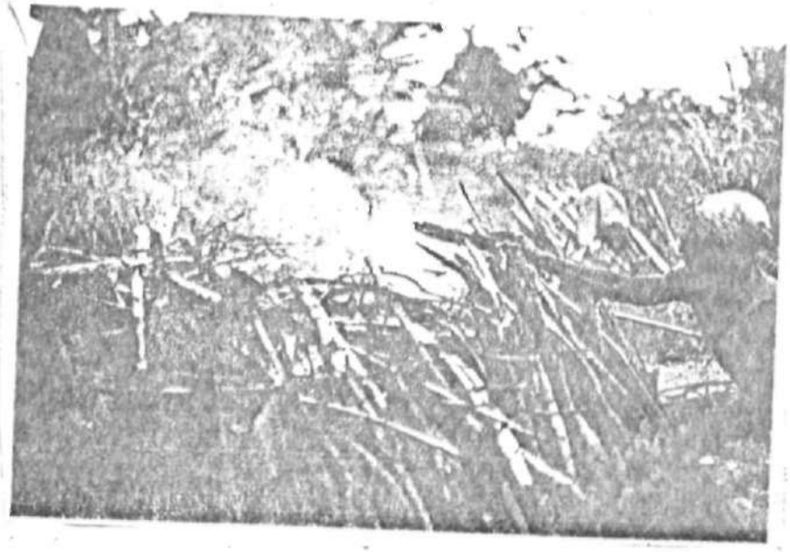




Fig 4 (c) Pot MAKING STOOPING POSITION.

Fig 5 FIRING OF POTS





2.3.3 Basketery

The materials used for making baskets are found in abundance in nature within Kachia Local Government area. e.g. reeds, raffia, bamboo, straw etc. Tools used for basket making are simple knives and awls only. Grasses of various kinds are picked before maturition and dried slowly in the shade. They are used for coil and for wrapping stiffer fibres. The commonest and perhaps the earliest basket technique is the coiled basket. The base of the basket is made of straw or reed wrapped with raffia or durable grasses. Coils are stictched and the base materials is spiralled into coils. Successive wider coils are made building the form out. The coiling and stitching continue till the basket is completed. This is done in several private houses in Kachia and the Evangelical Churches for West Africa (ECWA) Widow Training Centre, Samaru Kataf.

2.3.4 Mat Weaving

Mats are made from flexible cords from the branches of the raffia palm. The materials are woven or spinned forming a long cord of several metres. The cord is then stitched together forming a circle. The circle is cut through given a unified length of about two metres of the mat. Mat weaving is also a common trade of people living in and around Kachia. Women are also trained in the ECWA Widow Training Centre, Samaru.

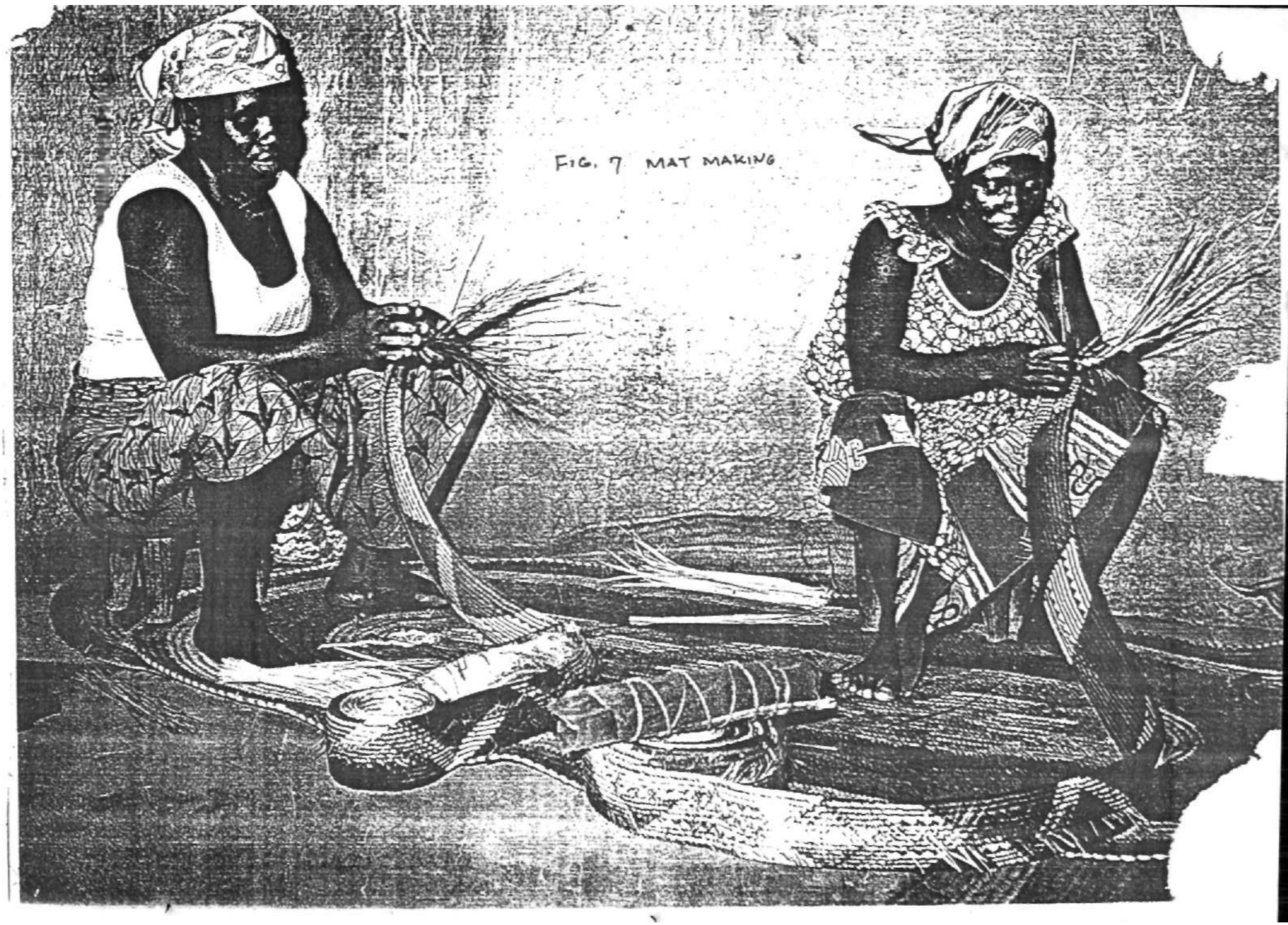


FIG. 7 MAT MAKING

2.3.5 Calabash Decoration

Calabash is a container for water, a peanut or bottle for shaking cream into butter, dipper in the well, a basin for washing, a container for eating and most commonly today, a room decoration element. Fresh calabashes are green in colour. The flesh calabashes are first allowed to dry by exposing them under the sunshine for days after which they are cut open to exposed the contents. The open calabashes are then soaked in water for few days for the internal lining or skin to become bloat and soft. These are again allowed to dry and harden and can be carved and worked upon very much like wood.

Calabashes could be decorated or under decorated. As soon as a calabash is decorated, it is transformed from merely a useful object to a status symbol. Decorations are made with hot knives or ordinary cold knives and painted. The negatives shapes are carved out leaving the positive intack.

In conclusion of this , it should be noted at this point that in the making of the crafts, different sitting positions are involved each depending on the particular craft. Normally the craftman sits or squats on the floor or low chair with his or her legs stretch to full length.

2.4 Prospects of Local Crafts

In Kachia the main occupation of the inhabitants is agricultural cultivation. Traditionally, culture inhibits women from farming but vested the obligation of farming to men. But due to economic constraints, high growth of population and urban migration of the youths in search of white collar jobs, the males left behind can no longer substence the families economic wise.

So with the establishment of a women vocational training centre in Kachia most of them can be trained in the various crafts to become skill craft women. The products can be sold out and the proceeds from the sell add up to the family income. Beside, training the women to become self-employed, this centre will also go along way promoting and substaining the rich culture of the people in Kachia.

In conclusion, it has one time been stated by a Russian Socialist woman that:

- "Outside work gives a woman an income of her own and thereby assures her of economic independence.
- Work is a factor in a woman's spiritual growth, in her civic and political awareness and in her development as a personality.
- A woman's contribution to social production has a positive effect on her children upbringing.

- It is to a large degree economically necessary that a woman works, for her income constitutes a substantial contribution to the family budget".

2.5 Traditional Method of Learning

In the traditional method learning which can be described as learn-on-the-job, apprentice were intially attached to the master craftman. In this case, while the master craftman was working on the particular craft, the trainee or apprentice kept on observing. Payment for this services were done on the basis of other services like farming, household activities etc being rendered to the master craftman.

Today, the situation has changed so much that apprentice gather round master craftmen. After observing for quite sometime, the trainees are finally allowed to try their hands on simple problems and then gradually to more complex and difficult ones by trial and error. This being supervised by the master craftman. Graduates of this method of training are usually skillful using passed experiences but to the extent of lacking the knowledge of the basic sciences relating to their disciplines as they find it difficult to prescribe solutions to problems they did not encountered during the duration of their training.

Local Learning Spaces in Kachia

It is difficult to find a complete or comprehensive learning centre of local crafts as project like these are expensive to the local people. Rather, individuals divine means and spaces of making and instructing on local crafts of their ability.

Learning of local crafts have been discovered to be done in two different space conditions. These include learning indoors and learning outdoors. It was revealed that the use of these spaces varies from crafts to crafts.

The House as Learning Centre

In Kachia, the predominant room form was oral in shape divided into the porch, the living room, the bed room and the stores for granaries by the women. Learning of the crafts was basically done within the living spaces where one or two apprentice gathered round the mistress craft woman receiving instructions through observations. In round huts which arrived after that and used concurrently, the same architecture is internally established with the entrance porch as the learning space. This could take about a maximum of three people too. Craft popularly done here include basket, mat weaving, calabash and wood carving.

Courtyard

As the traditional architecture of Nigeria has it, courtyard is one of the characteristics it possesses. This implies that dwelling units are planned in such a way that a free space is allowed either centrally as in the case of Kachia traditional architecture or multi-courtyards as in the case of the Hausa traditional architecture. Among the basic functions, the courtyard supports include, craft making, relaxation, as a local beer drinking and cultural dancing as in the case of Kachia people. Learning here takes place by the women sitting in circles round their instructors and this exercise always ends with tosh of traditional dances. This is to encourage the women to be frequently attending the exercise as this recreation entises them.

Footnotes:-

1. The Soviet Woman in the Family and Society. Feigg Blekher (1979). (A Sociological Study).
2. Joane and Buldolz, (1976). Nigerian Handicrafted Textiles. pp.

CHAPTER THREE.

3.0 PLANNING AND DESIGN GUIDE FOR VOCATIONAL INSTITUTIONS

3.1 Site Selection Procedure

In Nigeria, the choice of location for educational project is more often a result of a preconveived ideas than of a systematic approach and careful weighing of criteria. Many instances exist where the site is selected long before the projects are identified. This approach is usually due to political or/and other gains.

However in instances where a planner is awarded the chance to participate in selection of site for this types of projects, the followings are always recommended:

If the academic plan and social aims of the institutions are identified, they can be used in identifying possible sites for the project within the macro location. The information needed for this decision should include:-

- relation to the community, businesses etc.
- accessibility, infrastructure.
- relation to existing institutions.
- recreation policy and impact on certain groups of the population.
- size and shape of site.
- topography, soil quality, drainage etc.
- cost of site and future site development, etc.

In making the final selection out of the sites, micro location policies should be used to evaluate each of the alternatives. This should include details like

catchment areas for trainees, availability of manpower etc.

3.2 Site Planning Principles

For the design of an academic institution to be successful, certain planning facts must be adhered to strictly. These are as follows:

3.2.1 Flexibility and Growth

There is a common saying that buildings live longer than their briefs . This is applicable to educational buildings. The building designed for a particular purpose or function should be adaptable for other similar functions if the need arises in the course of modern developments. There is need either for the extension of the rooms or general development of the entire site in the future.

3.2.2 Zoning

The effectiveness of a design or space can be brought about when spaces with related functions are grouped together. There are several ways of doing this. The type chosen for one situation may not be applicable to another.

1. Zoning by primary space types in all functions with similar space requirements are grouped together. This system enhances adaptability and flexibility of spaces. It is also economical but problems of movement on the site and noise are common.

2. Functional Relationship i.e. similar activities are grouped and orderly flow of activities. However, it is costly and not flexible.

3. Technical Building Characteristics i.e. noisy activities, wet or dry activities are zoned together. There is usually a special locations for functions requiring the use of special materials and equipments.

3.2.3 Traffic Separation

There should be a clear separation between pedestrian and vehicular traffics. This could be done by arranging all functions requiring services of vehicles on the periphery of the site and then running a road that connects all of them. This will limit vehicular traffic to the periphery.

3.3 Design Guide for Workshop

The effectiveness of a workshop as a learning space is ensured when the following are considered in design of vocational training institutions. In vocational training more than 70% is devoted to practical work while less than 30% to theoritical work. The idea being that trainees should get some basic knowledge concerning their selected trades.

- Space required for work, and storage per student differ for each type of course and this is mainly due to (in local crafts) materials and free space required for working.

- Flexibility changes in terms of equipments and materials required/used for each course or the pattern of courses in the whole centre may change.

- What is necessarily required of a workshop as a learning space is a well free ventilated space with sufficient lighting.

- Workshop environment is not condusive for theoritical teaching. Separate provision for this is recommended or workshop situated at ground floors

- In certain trades there may be no use of a concrete separation for different processes within the craft. In some cases open spaces or simple roofed structures are adequate.

- Space requirement for some local crafts discussed in Chapter two are similar.

3.3.2 General Purpose Classroom

The effectiveness of a general purpose room as a space for learning can be ensured when the followings are considered in design; it should be comfortable and protected from wind, dust, rain and cold. Provision for plenty of ventilation, pleasant out-look of green areas and trees if possible. Good weather should be enjoyed by holding some outdoor classes and using the

outdoor for special projects. The outdoor therefore can be utilised as an extension of the classroom.

Building for learning are normally constructed to last many years during which the educational curriculum and methods are bound to change. Flexibility is therefore highly desirable.

Visual aids are becoming more important as new techniques of teaching therefore sufficient space in front of classroom must be warranted for, some means of darkening of rooms should be considered. The lighting should be adequate for work. A good visual environment reduces fatigue, restlessness and inattention. There should therefore be brightness, balance, nothing very dark and nothing very bright.

3.3.3 Arts and Crafts rooms

While art makes learner more keenly aware of the world he lives in and gives him the means of expressing himself in an interesting way, it also provides for all round literacy, development of senses and understanding of environment and other people, it teaches how to see, feel, think; the craft part teaches the learner to work with his hands and should teach him a little about quality of workmanship.

The spaces here could not be different from general purpose classrooms only that flexibility has to be ensured. Storage facilities for students should also be considered

in craftrooms.as much as visibility towards demonstrating table.

3.3.4 Flexibility and Adaptable Forms

The major problem of vocational institutions had always been how to rationalise space to cater for the diverse functions taking place almost simultaneously. Not much success has been made in this direction. Based on this, the idea of flexibility and adaptability of space will be discussed. A grid pattern or a free form is usually used as design pattern. An analysis of such patterns shows the square to be the most appropriate form use for adaptable and flexible space. Other forms could be used but with appropriate modifications.

Square: The square is the most widely used pattern in architectural design. Change in circulation is minimal after partitioning the space. Waste of partition materials is small.

Circle: The circle is second to the square in architectural use. It is predominant in African traditional architecture. Partitions create shape angles when used except if there is a smaller central circle.

Triangle: This pattern is seldom used in public buildings due to sharp building angles. Where partitions are used creates more sharper angles and waste of partition materials.

Free Form: This is popularly used in design but rarely in institutional buildings. Partitions are difficult to use. When intended. Or else there will be waste of materials.

It should be noted that the use of partition in institutional spaces create problem in one way or the other. This involve inability of partition to protect noise from penetrating into the spaces especially during activities that involve movement as in vocational institutions. Problem of cost and waste of materials are also features of this.

3.3.5 School Design for Comfort

Plan type: In the tropics double loaded corridors should be avoided where possible. This is because they hinder free air movement, thus affecting ventilation and the entire comfort of the interior spaces.

External openings: Protection of these should be ensured from solar penetration, wind, dust etc. This can be ensured by proper orientation of the buildings in such a way that these effects are minimised in the interiors.

Choice of Materials: Chosing materials for an institutional building, the main aim should be:

- that of protecting the interior from the weather and climatic hazards of the outside.

- that the building itself can survive the climatic and weather hazards and those posed by the ground bearing it.
- hazards due to pest and similar agent of destruction must be considered while selecting materials.
- that materials are aesthetically qualified for the purpose of the project.

Lighting: The importance of good lighting in improving working conditions and increasing concentration of trainee can not be over-emphasized. Daylight reaching interior spaces could be from:

- direct from sun.
- indirectly from the sky.
- from reflective ground and other surfaces.

The direct sunlight among the three sources is undesirable although it increases considerably illumination. It also causes discomfort due to strong contrast it creates in the spaces. It is desirable in the tropics to exclude this source of light, either by permanent means or using sun shading devices.

3.3.6 Colour in School Architecture

Colour if successfully applied can make direct and positive contribution to the effectiveness of a building. However, if mishandled its effects can be irritating.

A successful colour scheme should:

- be a means of expressing the appropriate character of the building, its inhabitants and their activities.
- together with the lighting should be able to provide an environment that will ensure comfort and efficient vision.

The choice of colour for different spaces differ depending on the type of activities going on in them.

- Teaching spaces - The trainee spend some of their time here, all changes of weather, temperature and light are experience here. Thus subdued colours with adequate reflecting factors are chosen.
- Communal spaces - These spaces are occupied for a short period of time. They are usually noisy and characterised by more energetic demands of group activities, strong colours are recommended.
- Circulation spaces - Students do not stay in these spaces but move through them. Colours can be used broadly to achieve exciting effects.
- Glare - Acute glare occurs when dark surfaces are seen against bright sources of light. Every effort should be made when designing to achieve a gentle gradation from the brighter to the darker parts and colour chosen should conform with this.

- A chalkboard used for formal instructions should be in just sufficient contrast with the surrounding walls to help hold the students' attention and should provide adequate contrast to the chalk.

3.4 New Teaching Techniques

The development of new teaching techniques to foster for better vocational training started in the United States of America (U.S.A) and is yet to be practised very well in Nigeria.

3.4.1 Team Teaching or Clustered Package Activities:-

This assumes that all complex skills can be broken down into simpler skills; thus a trainee who wants to take part in pottery and one who wants to carve a piece of sculpture or a trainee who wants to take part in textile weaving and that who wants to design a piece of cloth must both know about fractions and a simple "fraction learning package" can be put together for use by each. This development attributes significant commitment on the part of individuals and groups and from that, to innovative architectural programs and buildings to house them.

Team teaching is not a technique of reducing the number of instructors needed for a particular subject as such, but rather, a method that can be employed to assess and evaluate the trainees based on discussion and analysis. It leads to co-operation between instructors,

flexible grouping of trainees, utilisation of each instructor's best abilities and rearrangement of teaching spaces. The team instructors who plan together tend to develop new units of instruction largely oriented to the contemporary world. The trainees too, are always aware of the need, because instructors constantly plan for their discussion and analysis.

With team planning, priorities of instructions are established through group agreement rather than confined to isolated teachers and spaces. Therefore, trainees and how they learn came into a clear perspective and ideas are shared. This therefore, keeps a channel of good communication between both trainees and instructors perpectually open.

3.4.2 Audio-visual aids: Technological innovations used in this field of teaching include video tape recorders, film strips and slides, audio tape recorders, televisions, radio etc, it has been discovered experimentally that the use of these aids both increases the number of trainees, the urge to learn and also improves the quality of many individualised instruction tasks .

Here technology makes instruction visible to everybody whereby instructors can no longer hide behind the closed doors doing just what they want. It provides a medium through which the ability of instructor can be assessed and his methods of instruction criticised. Alot of instructional time is taken up by talking and

writing which however in television, are handled by others and instructor is left with more time on his hand than he is normally accustomed to. The success of classroom instructional work in vocational training has been enhanced by Audio-Visual aids.

CHAPTER FOUR

CASE STUDIES

This chapter devots itself to the study of existing women training centres available making a critical analysis and appraisals of the learning environment with the aim of understanding their architectural implications.

4.1 ECWA Widows' Training Centre, Samaru Kataf

Brief: The centre was established in April, 1978. It admits an average total of thirty women annually, with the minimum qualification of first school leaving certificate. The centre has four divisions which include:

Local Crafts

General Education

Commerce

Home Economics

The courses are offered on three years duration with an examination at the end of every academic year which students are expected to pass before promoted. The academic programmes cover from Monday to Saturday.

Location: The centre is located in Samaru-Kataf, a small town located along Kaduna-Kafanchan trunk road about thirty kilometres from Kafanchan. It is situated

within the heart of the town opposite Kaduna State College of Agriculture along Kafanchan - Saminaka trunk road.

Accessibility: The centre is accessible from the west cardinal direction from the main road to Saminaka from Kafanchan.

Facilities: These include the following:

(i) Academic facilities - classrooms, workshops for local crafts and library.

(ii) Social facilities - multi-purpose hall, open-space for conferences.

(iii) Accommodation facilities - dormitories.

(iv) Religious facilities - A chapel.

Planning: At the approach of the centre are the class-rooms and the Principal office by the right while opposite this block separated by a landscaped parking area are the dormitories, the chapel, the multi-purpose hall, library and another classroom block. These units are mixed up. The crafts and commerce units are located at the rear of the entire centre. Most of the units are separated by wide courtyards for outdoor activities of students:

Architecture: This embraces the followings:

Structures: Walls are load-bearing supporting double-pitched roofs over-hanged roof or verandahs are supported by poles and columns.

Materials: The materials used for construction include concrete, mud, timber, corrugated iron sheets, wooden and glass windows and panel doors.

Learning spaces: These include classrooms for general studies and commerce and craftrooms or workshops.

Classrooms - These measure about 6 x 9 x 2.8m and contain a student number varying from eighteen to fifty. While some classes are under-populated, others are over-conjested. Walls are both mud and sancrete construction while windows and doors are glass and panel respectively. Ceilings are of corrugated iron sheets instead of celotex.

Craftrooms or workshops - These include textile weaving, matting and basketing workshops. Similar to classrooms in all respects except windows are wooden panels.

The rate of use of these units is from 8.00 a.m to 2.00 p.m from Mondays to Saturdays.

General Apprails:

- Good orientation of blocks especially learning blocks.
- Under-openings in learning spaces.
- Poor architectural linkage between blocks.
- Courtyards too large and undefined.
- Poor use of materials.
- Less cost of construction by use of local materials.
- Stimulating architectural forms by the use of pointed arches.

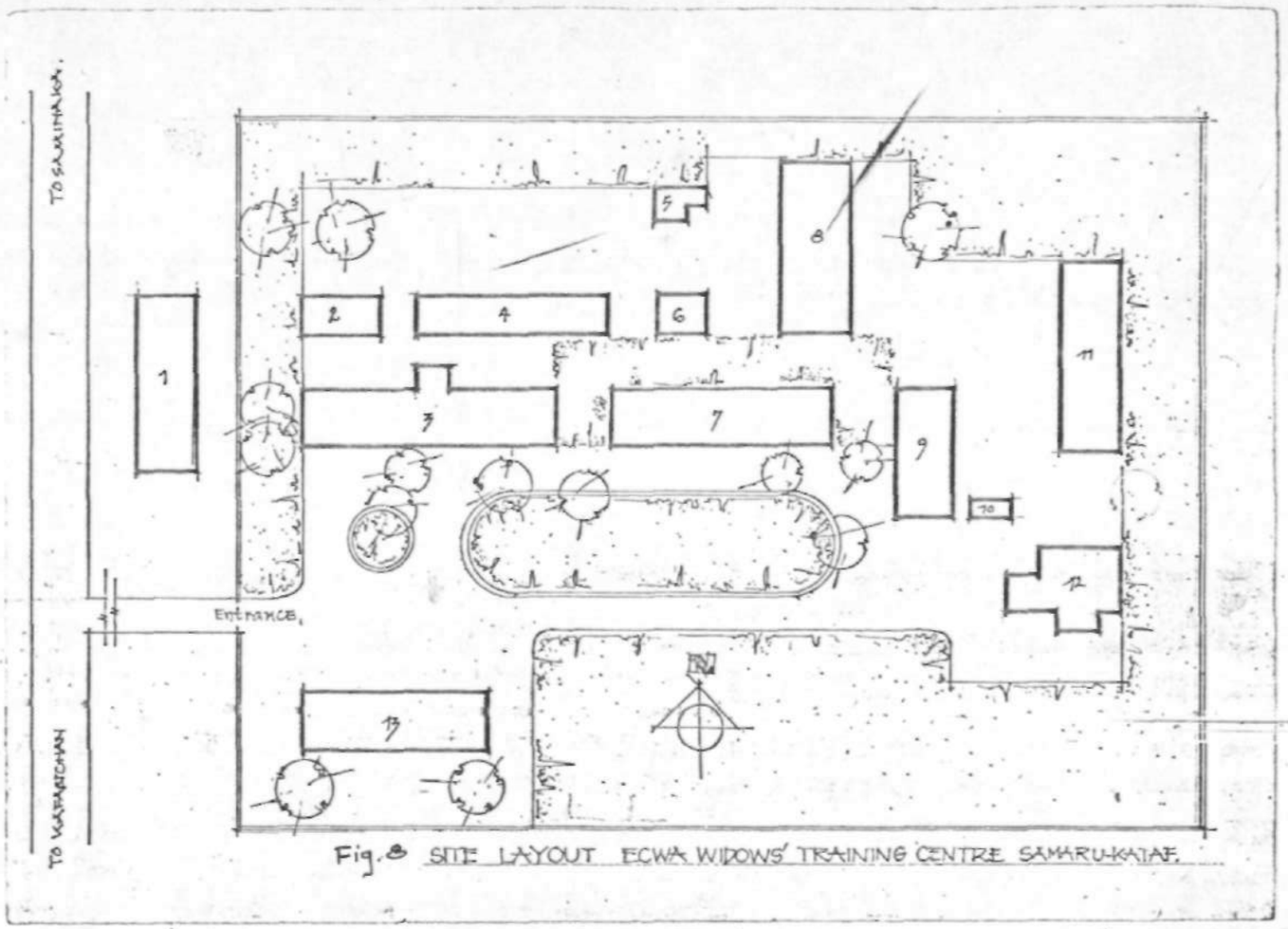


Fig. 8 SITE LAYOUT ECWA WIDOWS' TRAINING CENTRE SAMARU-KATAF.

LEGEND

1. Primary School
2. Dormitory
3. Dormitories and Chapel
4. Dormitory
5. Kitchen
6. Matron's House
7. Classrooms, Library and Multi-Purpose hall
8. New Dormitory
9. Workshops
10. Poultry Farm
11. Workshops
12. Principal's House
13. Classrooms and Principal's Office.

4.2 Jacaranda Pottery Centre Kaduna

Brief: This centre is located at the out-skirt of Kaduna along Kaduna-Kachia trunk road. This centre serves two purposes: commercial and training.

Accessibility: The centre is accessible from the main Kaduna-Kachia trunk road. It has two entrances which include main and service entrances. The main entrance is directed towards the administrative block, the staff quarters and the restaurant. The service entrace is directed towards the workshops and clay deposited bay.

Facilities: The centres facilities include an administrative unit, restaurant, pottery workshop, exhibition or sales room, staff accommodation and kilns.

Learning equipments: Learning is done on potters' wheels which are operated both manually and electrically. Learning starts with the preparation of clay, stitching, modelling of pots, glazing and firing in built kilns.

Planning: Units are arranged around courtyards. In the pottery section, the exhibition hall, the modelling workshop, glazing room/workshop and the firing kilns form a circular arrangement with a large circular courtyard. The administrative unit, restaurant and staff also form a courtyard with sub-courtyards within them. Most of these courtyards are used for outdoor relaxation and learning.

Architecture: This embraces the followings:

(i) Structures - walls are load-bearing supporting double pitched-thatch roofs resting on timber trusses.

(ii) Materials - mud, timber, grasses, etc, materials used for the construction of this centre are purely local and traditional.

(iii) Forms - Rectangular and circular traditional forms.

Learning spaces: Learning in this centre takes place in two different spaces, viz: courtyards and workshops. Preparation of clay takes place in the open courtyard while the proceeding stages take place in the workshops. These are two pot modelling workshops, the biggest measuring about 4 x 10m while the smaller one measuring about 2.5 x 4m. While the smaller one remains unused, the bigger one embraces stitching and modelling activities. This contains sinks, bins, wheels, worktop benches, racks, cold store room etc. Glazing workshop is isolated from the modelling workshop by a large courtyard and circular in form.

General appraisals:

- Planning encourages haphazard movement due to bad functional relationship scheme.
- Tight spaces in workshops due to too much activities taking place.
- Under size windows in workshops which allow insufficient lighting to trainees.

Fig.9 JACARANDA POTTERY
KADUNA

- Good orientation of workshops with the longer side facing north cardinal point.
- Use of local traditional materials reduces cost and demonstrate an identity of Kachia traditional architecture.
- Provision of courtyards provides spaces for outdoor learning and cross ventilation.

4.3 School of Home Economics Kaduna

Brief: The school was established in 1972 by the Ministry of Agriculture, Kaduna State. It has an annual intake of fourty students with minimum qualification of first school leaving certificate.

Location: The school is located along Katura road in Kawo Kaduna adjacent Plateau State Laison Office. It is on a temporary site and most of the structures are adapted.

Accessibility: Accessibility into this school is from Katura road. There is an entrance and an exit gate which reduces pedestrian and vehicular conflict.

Facilities: The followings are the available facilities in the school:

Administrative unit
Classrooms
Dormitories
Agricultural farms
Laboratories for food and sewing
Library.

Planning: The school is composed of three distinct blocks; the administrative block, the classroom block and the dormitories with the administrative block at the approach and the dormitories at the rear with the classrooms at the centre embodying a moderate-size courtyard for students experimental gardens, outdoor cooking etc. The library is situated at the approach too.

Architecture:

(i) Structures - The administration has a upper floor which accommodates the food and the clothing laboratories and is supported on frame structures. Walls are therefore, non load -bearing. Other buildings are only bungalows with verandahs which are supported by reinforced concrete columns.

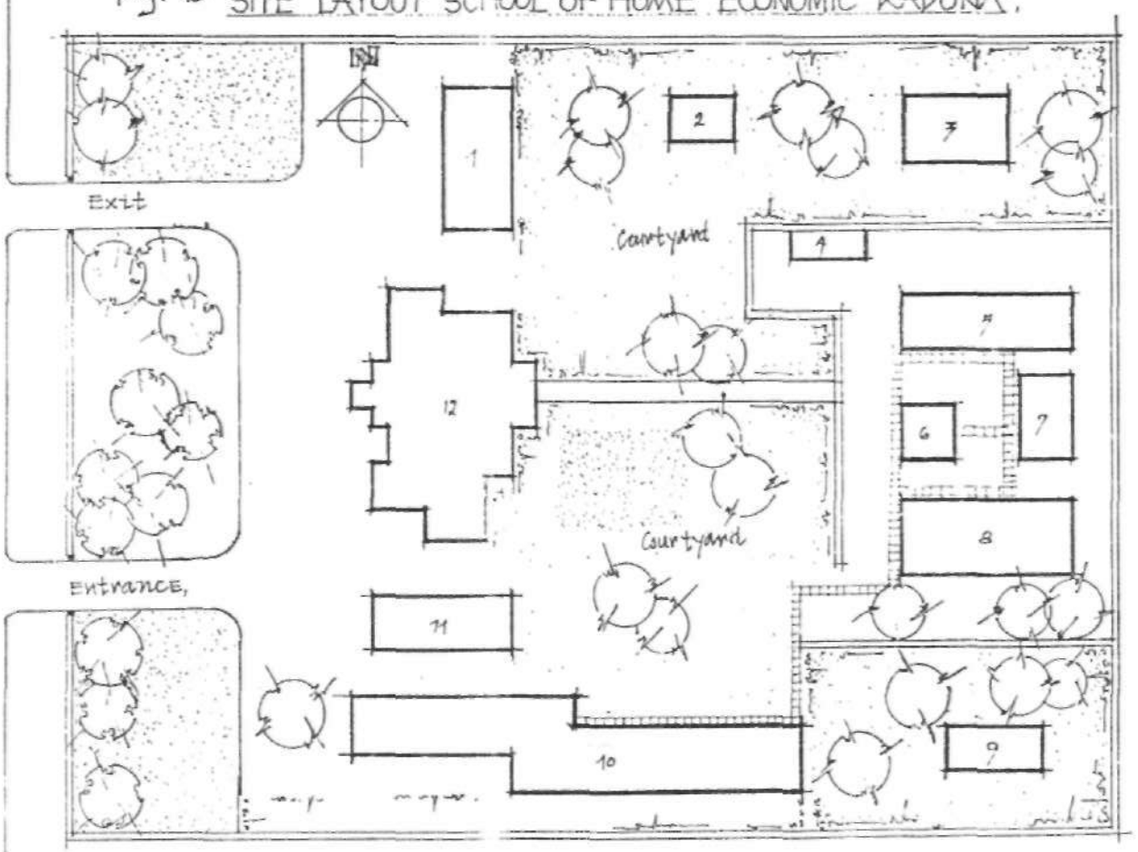
(ii) Materials - These include concrete, timber, corrugated iron sheets, celotex ceiling, casement and louvre windows, panel doors etc.

(iii) Forms - Rectangular shape only with concrete sun breakers.

Teaching facilities: There are three classrooms and two workshops. The classrooms are located at the quieter zone and accessible from both administration and domitories. They are provided with high level louvre windows. Teaching involving practical work and theory take place in classrooms.

The laboratories are located on the upper floor of the administrative block. These are adaptable spaces

Fig. 10 SITE LAYOUT SCHOOL OF HOME ECONOMIC KADUNA.



LEGEND

1. Library
2. Boys' Quarters
3. Matron's House
4. Poultry Farm
5. Dormitory
6. Common Room
7. Dormitory
8. Dormitory
9. Staff Houses
10. Classrooms and Staff Offices
11. General Store
12. Administration.

for the activities already mentioned above. Clothing laboratory containing three sewing machines was a bedroom while the food laboratory was a family-size living room.

General appraisals

- Proper orientation of classrooms
- Classrooms are located in a quiet zone and accessible from both administration and dormitories.
- Good landscape.
- Provision of courtyards as outdoor learning spaces.
- High-level windows in classrooms encourage poor ventilation.
- Library located at a noisy area.

4.4 Henderson/Decatur and Wayne County Vocational Centres

Henderson/Decatur and Wayne County Vocational Centres are two different vocational centres situated in two different locations in United States of America (U.S.A), but as prospects of the State of Tennessee, while Henderson/ Decatur Vocational Centre is located in Lexington, Wayne County Vocational Centre is located in Wenesboro.

Planning - The planning of these two centres is similar in many aspects. The design is divided into a High and Low bay. The high bays includes trades like Auto mechanics, building trades, metal and welding, electronical/electronics. To these, are connected auxillary classrooms, and support facilities

The Low bays have common laboratory spaces with auxillary classrooms, and support facilities like storage rooms, tool rooms and lockers.

Design goals

(i) Flexibility and expansibility - Research indicated that vocational school programs changed frequently - sometime during the actual construction of a building. So a kind of building that would accommodate the changes has to be developed.

(ii) Work environment - Noise level, comfort and lighting levels that will exist in industry had to be approximated so that the educational experience would not just be academic.

(iii) Speed and cost control - What was needed were buildings that were economical and sufficient and also of high quality.

Facilities - This include administration, workshops with equipments like lockers and stores for tools, toilets which are centrally placed.

Architects and team of constructors - Architects: Yearwood and Johnson - project architects: J. Michael Gonld, Engineers: Yearwood and Johnson, Project Engineers: John and Carpenter (Structural) Thomas Engineering Inc. Mechanical: Akinson and Associates (Electrical) Contractors: Park-Richardson Company and Management Construction, Inc. respectively.

Appraisals

(1) Merits

(i) Corridors connecting the various spaces have windows into each of the learning spaces. The idea being that

these spaces being for circulation could also be used for visual interaction making the whole building come alive with sense of all the activities going on.

(ii) Each of the working spaces is expandable, in two different directions.

(iii) There is zoning of the noisy trades and quietest trades - (High and Low bays respectively).

(2) Demerits

(i) The central location of auxiliary facilities like toilets is not convenient especially in Nigeria context.

(ii) Lack of courtyards within the whole building limit cross-ventilation.

CHAPTER FIVE

KACHIA

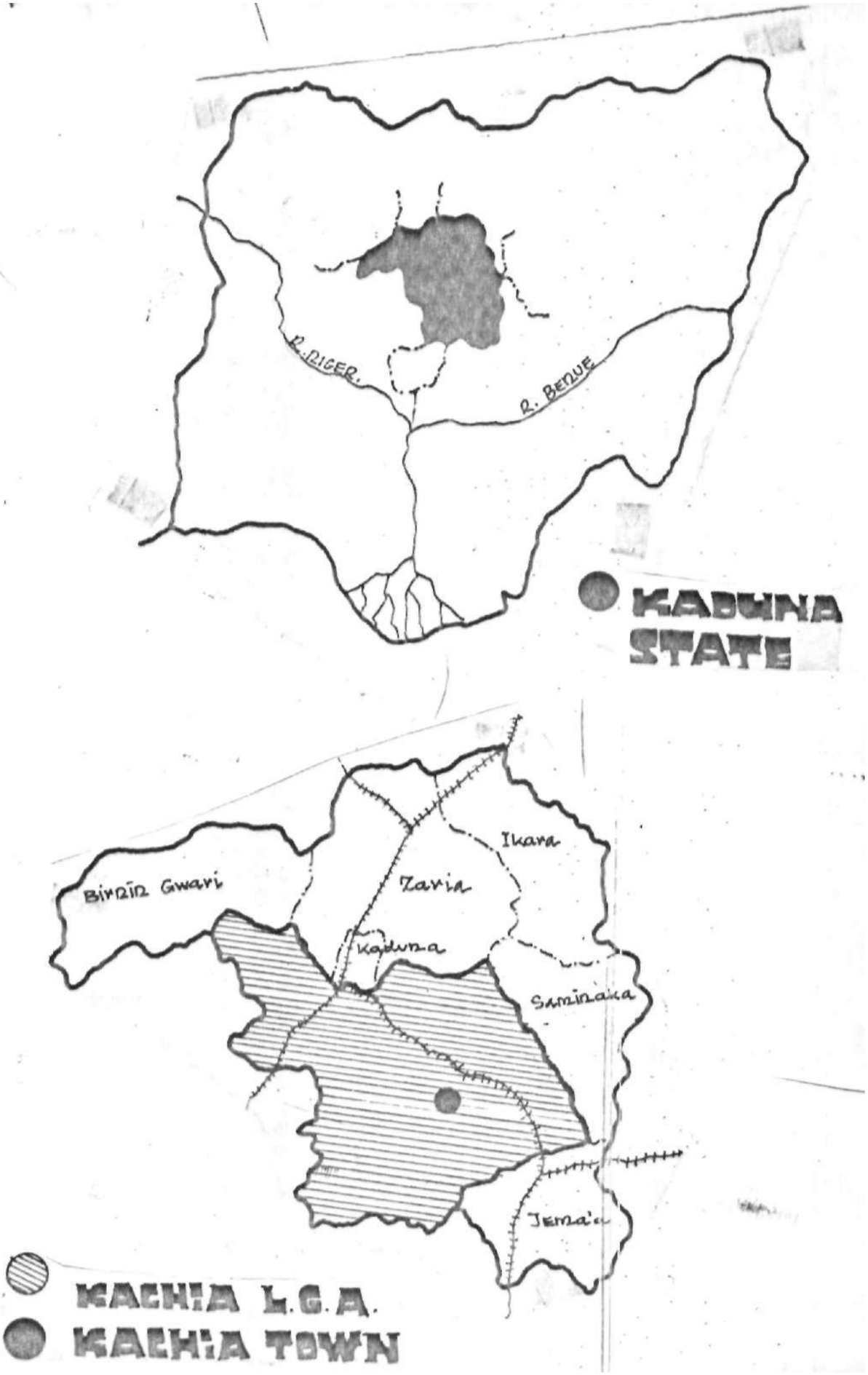
5.1.1 National Setting of Kachia

The geographical location of Kachia is approximately on longitude $7^{o}56'$ east of the prime meridian and latitude $9^{o}48'$ North of the Equator. Kachia as the headquarters of Kachia Local Government area was as early as 1926, an area which was a converging point of trade or sale of ginger. The construction of the Kaduna to Kafanchan road and the link road to Kafi, Kachia became a nodal meeting point for economic activities. Eventually, people started settling along nearby river Shahu but close to the main road.

With increase in population, the settlement attracted varied economic activities. Other sources of economic activity and income such as groundnut and cotton later took over from ginger with its decline. The inhabitants of Kachia include the Jaba, Ikulu, Kaje and Gure with the Hausa recently joining them.

5.1.2 Population

Kachia as a local government has a total of about 549,824, based on the 1988 projected population figure. With Kachia as the largest town within the local government; the projected population of Kachia to 1978 was 5,046 at a growing rate of 2.5%. The estimate of Kachia population based on 1963 was 4,006 which was not much reliable.


R. NIGER.
R. BENUE
KADUNA STATE
Birnin Gwari
Zaria
Ikara
Kaduna
Saminaka
Jema'a
KACHIA L.G.A.
KACHIA TOWN

5.1.3 Occupational and Employment Structure

The bulk of the population are dependent on farming and allied occupation. This is not unusual as the town falls within a predominantly agricultural area. About 22 percent of the population are farmers approximately 40 percent of the population are in schools receiving one form of education or the other.

The major problem faced by Kachia is its weak employment base and economic base with poor living standard and low per capita income. Employment opportunities in Kachia are very rare whereby both male and female engaged in subsistence farming to cater for the families. The reason is that there are no industrial and other establishments.

5.1.4 Education

Kachia has three primary schools which have a total intake of 1,170 pupils of which only one of them currently runs full strength, while the others have just recently been established. There are two secondary schools one of which was running a boarding students and with a student capacity of about 780 students has recently been converted into a day secondary school like the other one. It now admits a certain number of females as day students.

Other public institutions in Kachia include:

(i) The farm centre and farm institute established in 1972 with an initial students intake of 40 men.

(ii) The Koranic school established in 1977 with an initial students intake of 10 pupils.

5.2.3 Vegetation - Kachia is within the vast Southern Guinea Savannah which is an intermediate between grassland and derive Savanna zone. The vegetation is characterised by broad-leaved savannah woodland. The trees in certain areas may attain a cover of 6 - 12 metres when well developed, forming a continuous cover which be dense enough to suppress grass. Due to cultivation and grazing, the vegetation is usually open. The river valleys within Kachia and environs have distinct vegetation of grass, raphie and fan palms. There are scattered trees like the orchard, locust bean and baabab.

5.2.4 Natural Drainage - Kachia has a good physiography which helps self-drainage into the surrounding rivers and streams. The portion occupied by the town slopes gently to the South-west and South-east down the two river valleys.

5.3 Climatic Elements

5.3.1 Winds - Apart from the influence of the breeze from the two rivers on Kachia, the climate is influenced by two other wind systems. These are the south-west trade winds that bring about between 100 and 150cm of rainfall between March and October and the North-east trade winds that bring dry and dusty effects between November and February each year. The highest rainfall during this period is 25cm.

5.3.2 Temperature - The months of March, April and May are usually very hot. The temperature generally averages 29°C (or 80°F) during this period and about 18°C (or 64°F) during the harmattan period, i.e between November and February.

Fig 12(a) shows Annual Rainfall of Kachhia

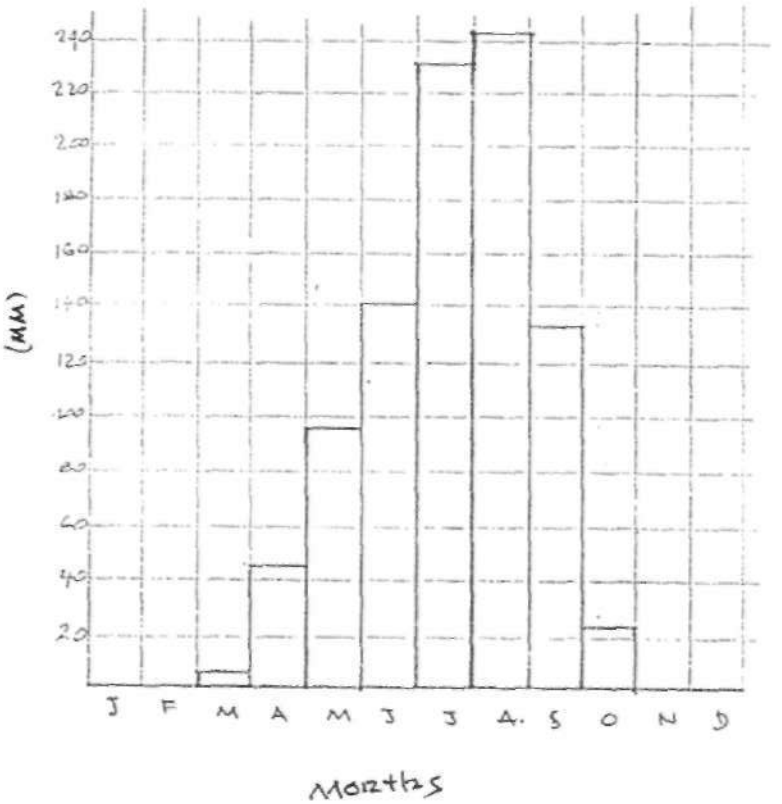


Fig 12(b) shows TEMPERATURE OF KACHHA

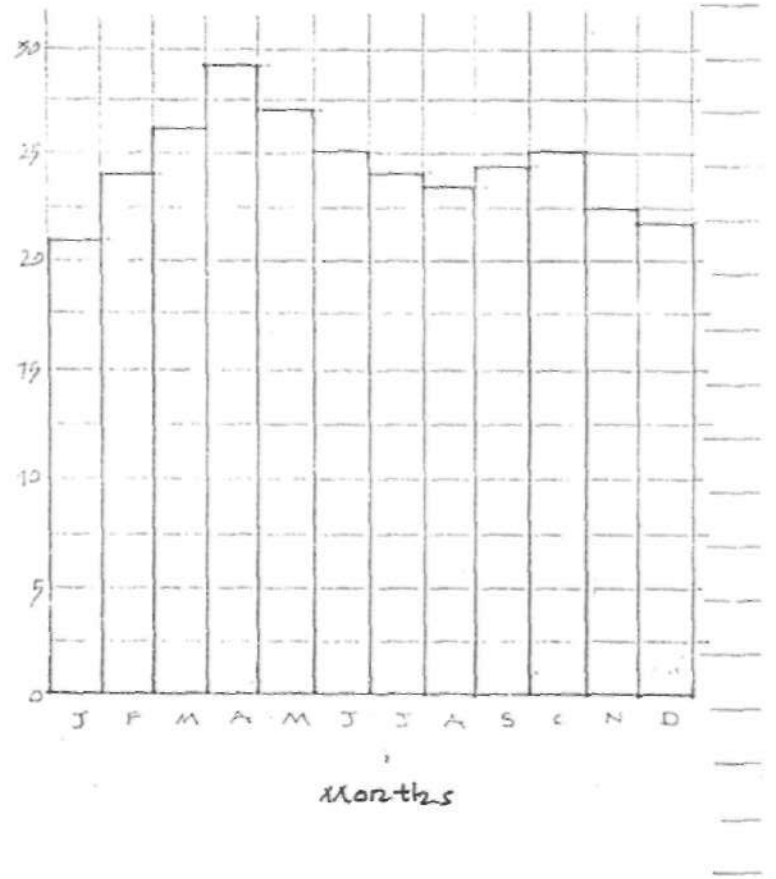


Fig. 13 (a) shows windspeed of Kachia

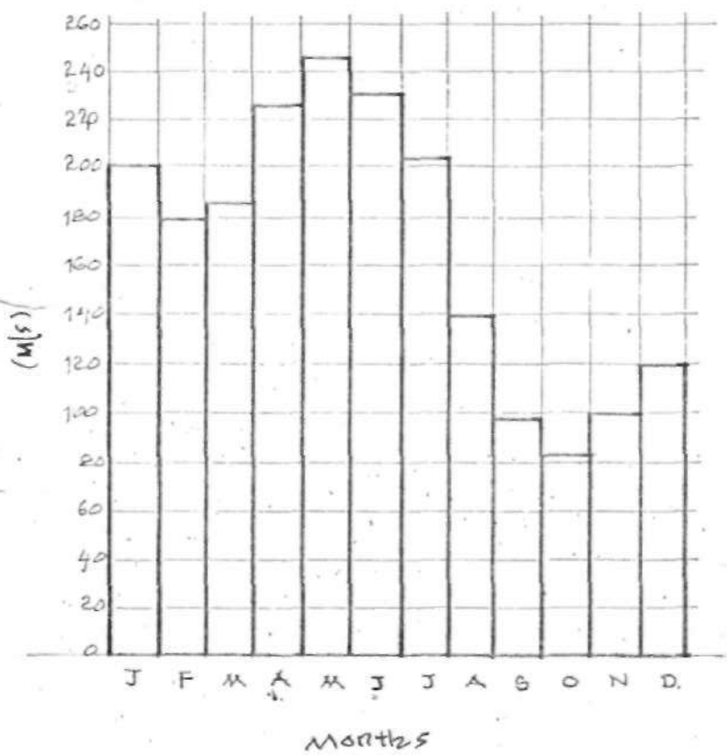
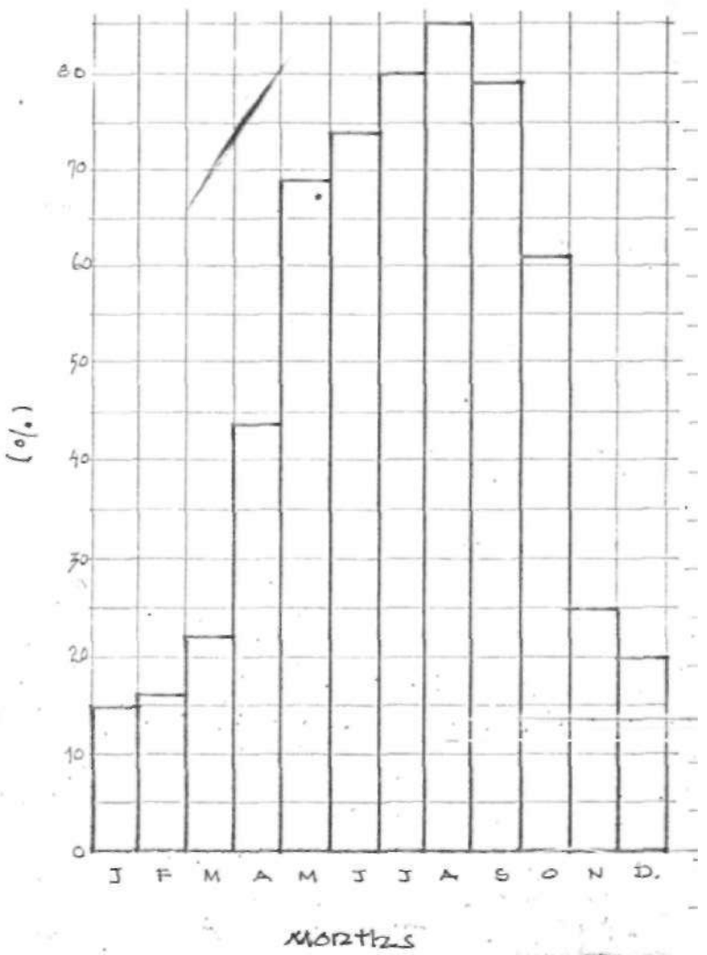


Fig. 13 (b) shows Relative humidity of Kachia.



5.3.3 Rainfall - The range of hills in the vicinity of Kachia do help to bring more rainfall (Orographic rainfall) and also helps to cool down the temperature during the hot season. The maximum rainfall normally recorded in Kachia is about 190cm and 150cm in the wet season brought about by the south-west trade wind. The minimum rainfall recorded in the dry season ranges from zero to 25cm. This is normally due to the influence of the North-East trade winds which blow across the Sahara desert.

5.3.4 Humidity - Is the amount of water vapour in the air. Humidity generally in the Northern parts of Nigeria is low especially during the dry season. The range from this region is between 20 and 50 percent. The dry season will have humidity as low as 20 percent while the wet season is hot and normally have humidity ranging from 50 to 70 percent. Effect of fall in humidity in Kachia manifests itself in the warping of seasoned woods and cracking of lips.

5.4 The Site

5.4.1 Site Selection Criteria

The choice of the site for this project was based on the following criteria.

(a) Relation to the community it is intended to serve - The site is located within the centre of the community. This is to ensure that women do not have to move to the centre by covering large distances -

couple with the fact that they have other domestic committments to cater for.

(b) Relation to the existing institutions and business centres. The site is located adjacent to the Government Secondary School, Kachia and opposite the Kachia main market. Other institutions and public centres close to this site are the main primary school and the neighbourhood centre. The location of this site very close to these public centres, will help advertise the presence and the existence of the training centre.

(c) Size of the Site - The site is large piece of land which cannot be used wholly.

(d) Topography, soil quality, drainage and water supply - The topography of this site is smooth and gently sloping towards the south-east towards the main river. This ensures natural drainage of the site. Electric power supply can be connected to the centre from the community. The soil quality is that of laterite.

5.4.2 Site Analysis

The chosen site is located almost within the heart of Kachia community opposite the main market of Kachia along the main road to Kachia Government Secondary School.

Area - Site is a very large piece of land, but have chosen an area of it based on accessibility.

Existing structures - The site is generally undeveloped, it is a cultivated land after which the stalks are used for animal grazing.

Physical features: The site is generally a flat piece of land at the southern part of the market. The site has few trees scattered at great distances in between them.

Drainage - The site despite its almost flatness, has a direction of natural drainage. It is drained towards the south-west direction towards the river.

Views - Standing on the site and viewing into all directions, one finds residential houses all around. Viewing towards the North direction across the main road to G.S.S., one finds densely populated residential settlement. Towards the East is another densely populated settlement. On the west and south, are scattered houses.

Accessibility - This site is accessible from two directions. It is accessible from the East from the road leading to the proposed bye-pass of Kachia. It is also accessible from the North from the road leading to G.S.S. from the Kaduna to Kafanchan road.

Pedestrian ways - There is a pedestrian walkway across the site from the market towards the residential buildings of the south of site.

CHAPTER SIX

ARCHITECTURE IN NIGERIA

There is no direction in architecture in Nigeria as it is a state of conflict - no one knows where to go or follow. One wonders of Alan Vanghan Richards words that, "although West African art, in particular sculpture, and music have had a profound effect upon their art-forms throughout the world, its architecture had made no impression whatsoever" is not true of Nigeria. No wonder the news and cries for an indigenous Nigerian architecture. A cross examination of Nigeria revealed three main types of Architecture. These include traditional, the vernacular and modern architecture. Only the traditional will be briefly discussed here.

6.1 Traditional Architecture

Traditional architecture implies the kind of architecture that is transmitted or hand over from one generation to another. Nigerian traditional architecture vary from region to region. The Hausa architecture varies from the Yoruba in special arrangements, forms, materials and aesthetics. It is possible to pick out the similarities in features of traditional architecture however.

Characteristics of Nigerian Traditional Architecture

John Godwin "says that indigenous traditional building is restricted to the provision of simple shelters which are designed for functional requirements and constructed with materials virtually found on site, such as mud, palm fonds and grass. Most of the traditional buildings are restricted to the rural areas. The main components of traditional architecture are spatial organisation, the forms and materials of construction which are discussed very briefly below.

(a) Spatial Organisation

The organisation of spaces in buildings in Nigeria differs from place to place. If we see architecture as involving essentially the organisation of space for human habitation, then this aspect is the most important aspect of traditional architecture. Generally in Nigeria buildings are placed round courtyards.

In the Yoruba areas, buildings are constructed with a central courtyard so that domestic work and circulation can conveniently be done without sunshine or effect of rainfall. The central courtyards are used for various activities such as relaxatio, hair dressing, cooking, making of local crafts etc.

The middle belt has a slightly similar courtyard planning too. This is common among the Tiv and Igala. In this case round huts are used for women while rectangular for men. These huts are arranged round a central courtyard called ate. The ate serves both social and recreational purposes.

In the North, the Hausa also arranged their huts around a central yard whereby the whole compound totally enclosed by tall walls for privacy and security. The front of the compounds have the entrance called Zaure into the general courtyards to the semi-private courtyards and finally to the private courtyards.

(b) Forms

The general or dominant forms used in traditional architecture in Nigeria are circular and the rectangular, with the circular more common than the rectangular. People believe the rectangular as some European influence on the circular. It is worth noting that Yoruba have been using the rectangular even before the arrival of the Europeans. The circular hut is much more used because it is advantageous to mud construction. It is also used based on the concept of form follows function.

Materials

Traditional building materials vary from South to North depending on the climate and availability of the materials in the locality. In the North these materials include; mud, thatch, bambo, split palm, stone and timber.

6.2 Vernacular Architecture

Traditional architecture has been influenced by a number of cultures which include 'Brazelian' influence, the North Africa influence. These influence have brought about what that is called Vernacular architecture.

6.3 Modern Architecture

This refers to as the 'international style' and was a product of industrial revolution. Technology increases rapidly and discovery of new building materials mainly concrete and steel permitted new capabilities in building structures. This came to Nigeria after the World War ISecond. Sky-scrappers, curved surfaces cantilevers etc can now be constructed.

5.4 Architecture of Kachia

The architecture of the people is necessary and is an aspect of their culture. The inhabitants of Kachia as mentioned earlier include the Kaje, Jaba, Kataf, Ikulu, Gure and some minor tribes with the

Hausa recently joining them. These settlers almost have a common architecture. They arranged their dwelling units round a big central courtyard not necessarily with fence like the Hausas do. The different architectural forms identified in Kachia include:

1. Round huts - Ritual huts (the huts used for the worship of ancestral spirits) must necessarily be round, with thatched roofs. This does not mean that round huts are not used for dwelling but the difference can be noticed in the internal partitioning. Round shapes are also used for entrance hall, and huts for domestic work like crafts.

2. The oval shape huts - With roofs either slopping up to a point at the top looking like an attic or double pitched with a central ridge and thatched. This is also partitioned into several rooms each with particular functions with the inner-most rooms serving as private granaries used by women. The front is also provided with a porch or verandah used for local craft learning and private relaxation place besides the general central courtyard.

3. The rectangular huts - These were introduced by the missionaries in the 1920s, not popular in the villages of Kachia.

These structures are basically constructed with mud walls on a very shallow foundation of about 25-35cm. Window openings are very small and the doorways, one has to stoop down to get through.

6.4 The Search for Identity

It is obvious that architecture in Nigeria has travelled a long way in a very short time, and has been influenced by a number of factors making us to loose what is truly Nigerian. No wonder the hews and cries by architects and other Nigerians for an indigenous solution to architecture. The questions that have to be answered here are; are we to neglect the modern building materials for traditional? Which forms do we use, the rectangular or the circular or a hybrid of the two?

Footnotes:-

1. Alan Vanghan - Richards, "Future of Architectural Design", Nigeria Magazine Vol. 93, 1967.
2. John Godwin, Architecture in Nigeria, Nigeria Magazine, Vol. 91, 1966.

CHAPTER SEVEN

DESIGN ANALYSIS

7.1 Brief and Design Scope

Women Vocational Training Centre Kachia as has been earlier stated is basically that of local crafts once practice in Kachia. Emphasis will therefore be laid on the learning spaces of these crafts. Other functions and services to be provided in this centre will include a multi-purpose hall, administrative building, a women recreational yard, domestic science unit, restaurant, clinic, classrooms and salesshop for students projects.

7.1.1 Administrative Unit - This caters for the administration of the whole centre's activities. It will therefore consist of the Head, assistant, supported by the following officers: counselling, carrier, bursar, purchase, sales and teaching staff.

7.1.2 Craft Units - This is divided into different sub-units which include; textile weaving, pottery, basketery, matting, carving and others.

7.1.3 Domestic Science Units - This deals with family living, Activities here will include, cooking, hair plaiting, cosmetic, poultry, sewing etc.

7.1.4 Multi-purpose Hall - This will serve a number of activities including indoor assemblies, seminar presentations, symposia, dramas etc. This can be rented out to organisations, individuals etc. of which the proceeds used to maintain the centre.

7.1.5 Recreational yard (or amphi-theatre) - This will be a women centre where they can perform traditional dances of Kachia women which include CHARA, KUKU, BORI, GUGWA, ZUNZOO and dramas. These activities will encourage the women attendance to the centre. (These are performed in private houses by the women).

7.1.6 Classrooms/Library - These will deal with adult literacy teaching and allied courses in local crafts. The library will be mostly use by the members of staff.

7.1.7 Saleshop - Completed projects of women will be sold here to members of the public and interested individuals.

7.1.8 Welfare - This include the clinic for minor dispensing and restaurant for members of staff and women.

7.2 Functional Relationship

In a centre like this, it would be expected women would pecialise in more than one trade. This therefore demands an Architectural sequence of locating the various units of the centre. There is need to analyse the functions that are closely related and to plan the design in such a way that such functions are put together. The functional relationship was graded according to related activities or functions.

7.3 Conceptual Analysis:

Concept is an abstract idea or way to satisfy a developer's programs, develope a memorable training environment and satisfy users' needs for a specific site. Concepts are also based upon particular impressions and information that can be expressed graphically and from which a design can be developed. Concepts are the products of understanding and interpreting the site's potentials and limitations (through analysis), user needs (embodied in the program) and combining them into an idea.

7.3.1 Site Concept

This is also referred to as concept plan. It is defined as "the organisation of the total land area and airspace of the site for use by the people who will occupy it". The site concept determines

the proposed location of each section of the building, which finally determines the actual, overall site plan.

The site concept was therefore based on:

(1) accessibility
(2) separation of vehicular pedestrian conflict.
(3) related functions and privacy.
(4) nature of job as related to tidiness, public noise etc.

The administrative and multi-purpose hall units are located to the main access into the site for public, and as noisy area. The craft units are located at the rear sides for vehicular service access and vehicular/pedestrian separation, privacy and untidiness, while the recreational areas are located at the centre for access from the various units with the classrooms on upper floors.

7.3.2 Design Concept

The concept of the design concept was adopted from the local architecture of the people within and around Kachia.

(i) Spacial Organisation: The proposal here involves using the courtyard concept with hierarchy of spaces characteristic of the people of Kachia and dominant Hausa architecture. This hierarchy involves public zone, semi public zone and private zone for

privacy. The courtyards here do not only warrant privacy, but provide ample space for outdoor learning or activities, ventilation for comfort and good work environment.

This is therefore proposed to have one central courtyard with each section of the building built round private courtyard. The central courtyard will house the recreational facility like the amphi-theatre.

(ii) Forms: These are expected to be curvilinear cut out of the circumference of a circle, a major characteristic of people of Kachia architecture of circular house planning with circular house forms. This centre is expected to be and extension of the forms and planning the rural women are used in their houses and also a dicotonomy of the popular rectangular forms found in formal educational institutions.

7.4 Schedule of Accommodation and Space Requirements

Since there is no authentic data on the population of Kachia, it is difficult to know, based on some calculations or otherwise the population of women to be using this centre. Not withstanding, the population is estimated based on the proposal made by the National Board for Technical and Vocational Education. Provision for future expansion would therefore be made.

Estimated women population in the centre = 600

as against a minimum of 300 provided by N.B.T.V.E.

(a) Number of students per practical class = 16 max.

(b) Number of students per theory class = 32 max.

Based on (a), the total number of learning spaces can be calculated,

$$\text{Learning spaces} = \frac{600}{16} = 38$$

Utilization factor of 80%

$$= \frac{80}{100} \times \frac{38}{1}$$

$$\underline{\text{Learning spaces} = 30}$$

$$\text{Number of teachers} = \frac{600}{16} = 38$$

$$\text{Teaching staff} = \underline{38 \text{ teachers}}$$

A. Functional Space Requirements for Administration

Functions	Required No. of Units	Net Area of Units (m^2)	Gross Area of units (m^2)
Principal Office	1	25.0	25.0
Vice-Principal Office	1	20.0	20.0
Finance Office	1	12.75	12.75
Carrier Office	1	12.75	
Counselling Office	1	12.75	
Purchase Office	1	12.75	
Staff room	1	50.0	
Conference room	1	50.0	
General Office	1	20.0	

	Functions	Required No. of Units	Net Area of Units (m^2)	Gross Area of units (m^2)
	Show room	1	12.75	
	Secretary and typing	1	14.0	
	Stationary store	1	12.75	
	Entrance and reception hall	1	38.25	
B.	Welfare Facilities			
	Waiting hall	1	22.75	
	Consultant office	1	8.0	
	Dispensing room	1	6.75	
	Restaurant	1	48.0	
C.	Social and Recreational Facilities			
	Multi-purpose hall	1	312.5	
	Performance stage	1	50.0	
	Rehearsal room	1	37.0	
	Changing rooms	2	17.0	34.00
	Recreational yard (Amphitheatre)	1	706.5	
	Cultural room	1	42.0	
	Saleshop	1	135.0	
	Cashier office	1	12.75	

D. Practical and Theoritical Facilities

Functions	Required No. of Units	Net Area of Units (m^2)	Gross Area of units (m^2)
Classrooms	6	56.0	336.0
General purpose classroom	2		
Tutorial rooms	2	30.0	60.0
Library	1	135.0	
Librarian	1	14.0	
Store for library	1	12.0	
Main stores	2		
Textile weaving room	2	56.0	112.0
Spinning room	1	37.25	
Dyeing laboratory	1	37.25	
Stores (raw and finished products)	4		37.25
Pot modelling workshop	2	70.0	140.0
Clay preparatory room		56.0	
Glazing workshop	1	56.0	
Classroom	1	30.0	
Store (for raw and finished materials)	1	30.0	
Chaning room	1	30.0	
Kilns	2	1.75	3.5
Basket weaving	3	56.0	150.0
Store	1	15.0	
Mat weaving rooms	2	56.0	100.0
Mat joining room	2	56.0	100.0
Stores	2		37.5

Functions	Required No. of Units	Net Area of Units (m^2)	Gross Area of units (m2)
Calabash carving rooms	1	56.0	
Calabash preparation	1	56.0	
Calabash decoration	2	56.0	
Store	1	56.0	
Leather workshop	1	56.0	
Ornamental workshop	1	56.0	
Wood workshop	1	56.0	
Store	1	20.0	
Hair plaiting room	1	42.0	
Domestic science laboratory	1	56.0	
Food laboratory	1	56.0	
Demonstration room	1	48.0	

CHAPTER EIGHT

8.0 DESIGN REPORT

8.1 Site Planning

This was related to the site concept. Main access into the centre is from the north direction. Care was taking to separate pedestrian from vehicular. A separate access was provided for vehicles bringing raw materials for used. Parking for staff and visitors was located infromt of the administration and multi-purpose hall.

8.1:1 Spacial Organisation

The aim was to make the spaces flow into one another, while according privacy, work space and comfort to women working in each of the sections. This was achieved by using courtyards. There is the central courtyard which is used as the amphi theatre for cultural dances and dramas. Each of the units has its own private courtyard.

8.1:2 Forms

The forms used for the whole design was curvalinear. This depicts one of the characteristics of architecture of the people of Kachia. The use of

the spacial planning of the centre is also a characteristic of the epople's architecture. In essence, the aim of these features in this centre is to be like an extension of the house set-up of the villages of Kachia.

8.2 Workshop and Classrooms

Design of this units is done in such a way that they have the same areas, while the workshops can carry a maximum of sixteen women, the classrooms can carry a maximum of thirty-two. These spaces can therefore be adaptable. Classrooms were located on upper floors.

8.2:1 Lighting

Since there is no electricity in Kachia, emphasis was given to natural lighting. This was done by the provision of good number of windows with sun shading devices which can eliminate solar radiation and glare from the interiors.

8.2:2 Storage

Apart from the two main stores for the storage of bulk raw materials, each unit of the training centre

has a store for materials of immediate use, and storage of finished student projects.

8.2:3 Outdoor Learning Spaces

These are the courtyards .

8.3 Services

These include sewage, storm water, water supply and electricity. Paved gutters are provided within courtyards and around buildings for storm water drainage. This is drained along the direction of slope of site. Water and electricity can be tapped from inside the town.

8.4 Construction

Materials used for construction include concrete bricks, reinforced bars, roofing sheets, cements, ceramic tiles and other local materials.

8.4:1 Openings

Windows were louvres, casement metal windows and doors and panel doors.

8.4:2 Roofs and Floors

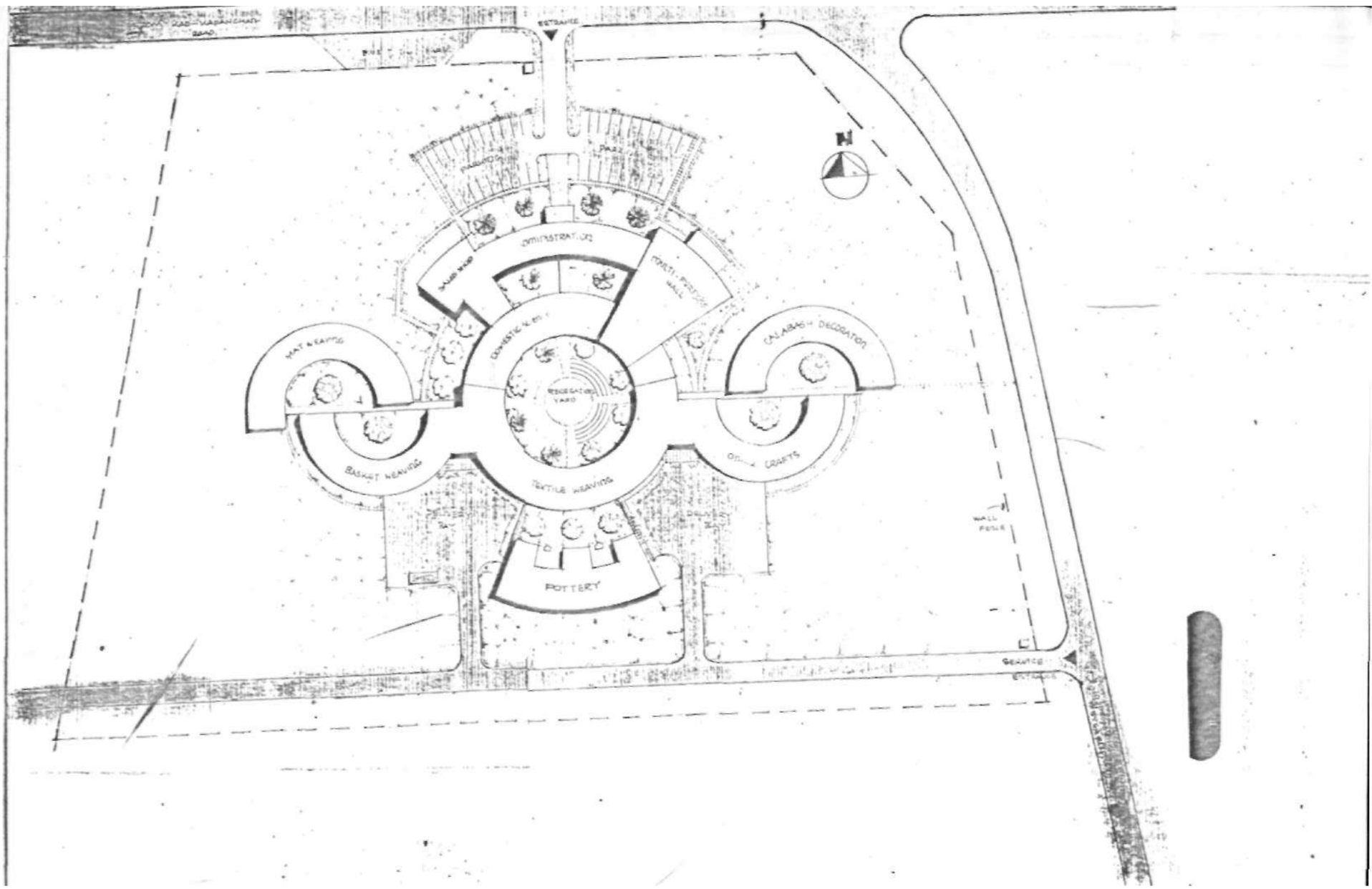
Roofs were of timber, steel and zinc. Ceilings were of celotex board. Floor was constructed of sand and cement, terrazo finished and quarry tiles.

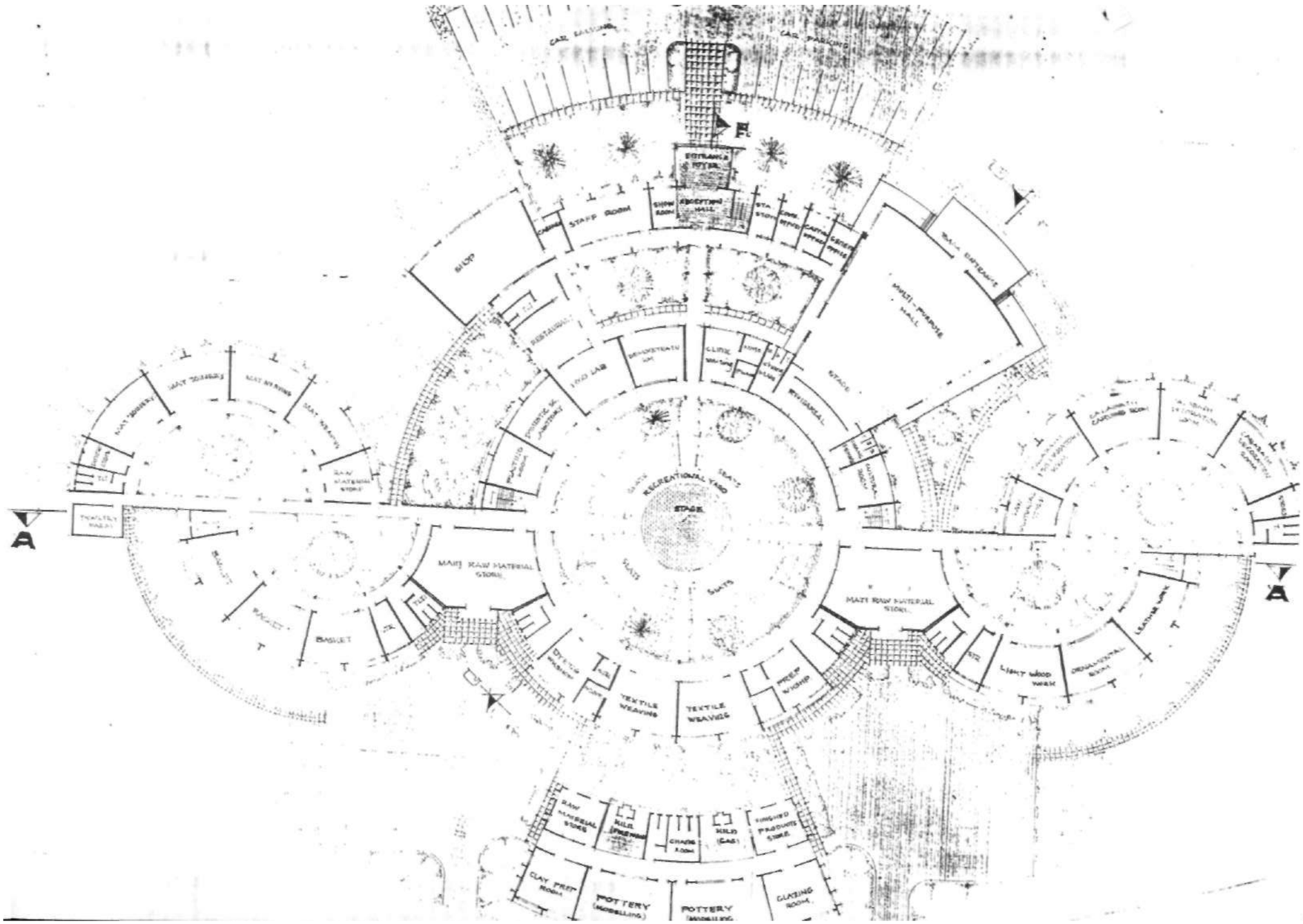
8.4:3 Sections, Elevations

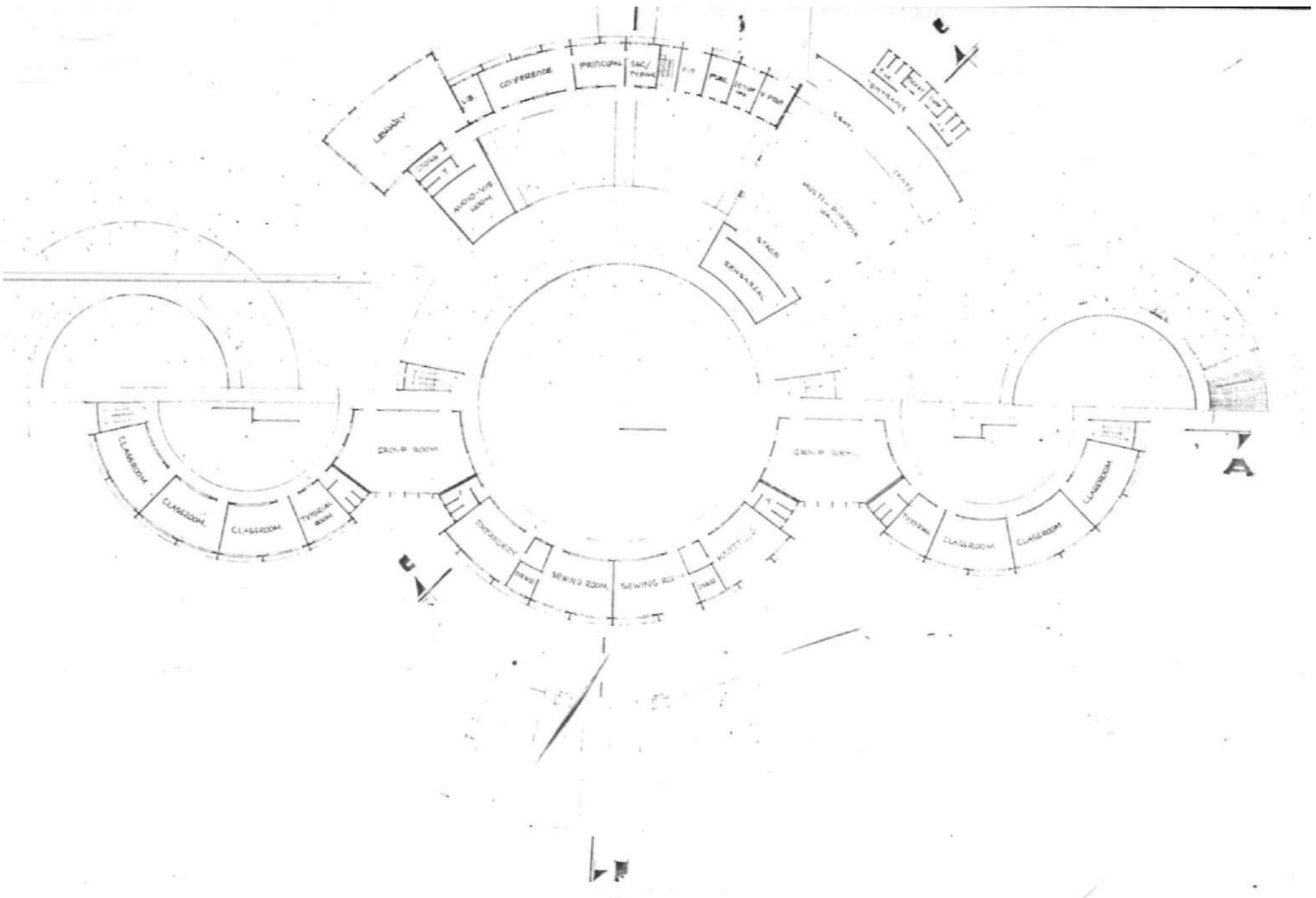
These are as shown.

8.5 Landscape

Open areas were properly landscaped. Courtyards were also landscaped so that the educational experience will not just be academic.


ENTRANCE
N
PARADE
PRAZ
ADMINISTRATION
DOMESTIC SCIENCE
MAT & MATTING
BASKET WEAVING
TEXTILE WEAVING
POTTERY
CALABASH DECORATION
SERVICE


CAR PARKING
ENTRANCE FOYER
STAFF ROOM
SHOP
MULTI - PURPOSE HALL
STAGE
REHEARSAL
RECREATIONAL YARD
STAGE
MATT RAW MATERIAL STORE
MATT RAW MATERIAL STORE
TEXTILE WEAVING
TEXTILE WEAVING
PREP WORK
DYEING
RAW MATERIAL STORE
KILN (GAS)
FINISHED PRODUCTS STORE
CLAY PREP ROOM
POTTERY
POTTERY
GLAZING ROOM
LIGHT WOOD WORK
BASKET
BASKET
MAT WEAVING
MAT WEAVING
MAT WEAVING
RAW MATERIAL STORE
TOILETS
A
A


LIBRARY
CONFERENCE
PRINCIPAL
SEC/TYPING
PUBL
AUDIO-VIS ROOM
STAGE
REHEARSAL
GROUP ROOM
CLASSROOM
CLASSROOM
CLASSROOM
TYPING ROOM
EMERGENCY
SEWING ROOM
SEWING ROOM
KNITTING
CLASSROOM
CLASSROOM
CLASSROOM
TYPING
A

SECTION A-A

SECTION B-B

SECTION C-C

WEST ELEVATION

NORTH ELEVATION

NORTH HIGH
HIGH

Summary

The economic and social values of Nigerians have changed very rapidly from indigenous, traditional things to foreign, imported things. Anything foreign is good, the indigenous is bad. This has therefore affected what is trully Nigerian - the local crafts. This study therefore started with the study of these local crafts available in Kachia and the local and modern learning spaces with the aim of achieving effective learning spaces. A further study was also made in the form of local and foreign case studies with the aim of appraising the architectural implication in educational design.

A study of the design site was also made with the aim of adapting the proposed design to the prevailing climatic factors. A brief analyse of the characteristics of architecture in Nigeria was also done.

Conclusion

In the course of this study, it was stated by the author that the main problem of vocational education has always been the rationalising of spaces to cater for the diverse activities taking place simultaneously, the problem of ensuring work space and comfort. An approach to those problems was made by considering the users, the type of spaces they are used to. Another approach to this problem is by flexible and adaptable spaces - to cater for the diverse activities and growth. There

is needs for a building designed for a particular purpose or function to be adaptable for other similar functions if the need arises in the course of modern developments. There is need either for the extension of the rooms or general development of the entire site in the future.

Architects stand the challenge of these in design. This thesis has therefore left room for further research work. Challenge is also thrown to architects to find new dimension in developing effective learning spaces of all types.

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