MEDICARE FOR THE PEASANTS

BY

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D E C L A R A T I O N

I declare that the material composed hereafter, has been the product of my research work for the thesis on Medicare for the Peasants, under the Supervision of Dr. Hamman Tukur Sa'ad.

All sources of information are acknowledged and given at the end of the thesis as bibliography.

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D E D I C A T I O N

TO ALLAH

The creator, Restorer and Doer of the Feasant and whatsoever He Wills. He whose throne is glorious and whose power, mighty. Who guides the elects to the orthodox path and the right way.

- He is one in His Essence without any associate
- Single without any compeer
- Eternal without any opposite
- Seperate without any like
- Ancient with nothing preceeding Him
- Eternal without any beginning
- Abiding in existance with none after him
- Everlasting without any end, and the things which he know have no end
- Subsisting without Cessation and at the end of time He will not be subjected to dissolition or decay, but He is the first and Last.
- Abiding without termination
- The external and the internal and He know all.
- He is hearer and seer
- He is nearer to a creature than its jugular vein (Quran, Chapter 50, Verse 15).

Despite all these attributes of Allah, He was gracious to man by bringing him into existence after he was concealed in non existence. He also gave man;

strength after weakness

sight after Blindness

Speech after Dumbness

Guidance after Misguidance

Wealth after Poverty.

He made man full after hunger, and clothed him after nakadness.

Look at how Allah Directed man and [illegible] him. All these Allah did as a manifestation of his power and a realization of that which had proceed of His will and that which existed in eternity of his word, and NOT BECAUSE HE HAD ANY NEED OR NECESSITY FOR IT.

ALLAH IS THE GREATEST, MOST MERCIFUL.

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A L H A M D U L I L L A H

A B S T R A C T

In most developing countries and many industrialized countries, substantial numbers of people get sick and die from conditions that could be prevented or be readily treated. Yet, vast sums of money were being spent on sophisticated disgnosis and therapy for a relatively small proportion of people served mainly in urban Hospitals.

A disturbing paradox is that, while in policy terms, National Planning tends to give high priority to Primary Health Care (Preventive), the lion's share of the Ministry of Health expenditure actually goes for hospital in towns and cities. This leaves the most deserved Primary Medicare services in the rural areas at the disadvantageous end. It is as a result of this that the World Health Organisation (W.H.O.) reported that "the present health care system is estimated to cover twenty five per cent (25%) of the Nigerian Population".

This thesis aims at making an investigation of the adequacy of the existing Medicare services in the rural areas in Kaduna State. It also intends to provide architectural solutions to the present problem of planning and upgrading of both curative and Preventive Medicare services - in order to bridge the gap between the two.

These are carried out with the aim of achieving maximum returns in human welfare of the rural peasants. It is obvious that a healthy people are better workers, better students, better peasants, better citizens and so on. The primary objectives of this thesis are:

(1) To establish a growth link between the organisational heirachy of Health services, starting from the grassroot stage, to satisfy the basic human biological health demands and the medium stage which will provide a slightly sophisticated health function, up to the National Hospital which tops the ladder. This requires a flexible architectural solution where functions can be converted, disruption of existing building and still be maintained with minimum staff.

(2) To provide centralized preventive and curative Medicare services together for each size of community of populatio· ranging from 50,000 to 80,000 forming a health unit. This will go a long way in promoting and protecting the effectiveness of management and quality of patient care. It will also bring the Medicare facilities nearer to the peasant's home thereby reducing the travel on the part of the patient and his visitors, so that the family is less disrupted than it would be by admission to a larger and obviously more distant hospital.

This will at the end of the day increase the coverage of Medicare services, allowing it to penetrate the deep rural areas.

(3) To reconcile the cosy, personalised traditional Medicine with the provision of slightly more sophisticated Medicare services that has integrated range of necessary facets of Health care that can be supported by that size of population if need be. The medical-cum social advance planned for here would be made to have a high degree of flexibility and economy.

(4) To orient the Medicare system towards overcomming the occurence, reoccurence and spread of the specific diseases observed to be persistently prevalent in each catchment area (health unit).

(5) To reorient the Medicare Services delivery with a view of attracting the peasants towards adequate usage of these facilities, and to enhance the partial and eventually full participation of the peasants in the construction and maintenance of the Medicare facilities. This will reduce load on the government and hence the economy of the nation.

The above aims show that the peasants need not only one complex Hospital, but a wide distribution of all the types of Medicare facilities located at various points within their localities.

This will bring the health services within the doors of the peasant of any area. The Medicare services will provide referral and other supportive services. About 60 - 70% of the Patients with minor complaints will be treated in the smaller centres and more complicated cases will be refered to the hospitals. This system provides the hospital staff and doctors enough time for proper history taking, proper examination, diagnosis and correct treatments to their patients accordingly.

The thesis involves the design of the basic requirement of each health unit - which include:

(i) DISPENSARY:

This is a small health unit serving a small number of people (not more than 100 daily) in sparcely settled areas with health personnel staying and providing the medical assistance needed at that level.

(ii) HEALTH SUB-CENTRES:

The health sub-centres will perform additional functions to those of the dispensary such as dental health, public health nursing, referal services and a nursing units for small number of people. It will serve about 200 persons daily and will be sited in medium density settlements.

(iii) THE COMPREHENSIVE HEALTH CENTRE:

This centre will carry out the functions of the sub-centre with a higher degree of sophistication and would be responsible for supervision of a number of satellite health sub-centres and dispensaries.

The facilities to be provided would be restricted to general medical care, uncomplicated surgeries, and obstetrics and minor surgery. Special major surgical procedures would be refered to the other higher medicare centres (General and Specialists Hospital). Health personnel for the Opthalmic and Ear, nose and throat (E.N.T.) will provide additional health services occasionally.

Analysis of the functions and spaces required by different basic functions of Medicare facilities enabled the author to propose some standard room sizes that are flexible and whose functions can be changed by change of the morable furniture within the room but with no change in its size,

To prove the feasibility og the proposal, the comprehensive health centre was sited on an existing site at Dutsin-ma town in Kaduna State. Detail drawings of both the building construction components were produced for proper communication of the ideas.

INTRODUCTION

One of the five main objectives of the Third National Development Plan is how to promote, protecting, restoring and improving the health of all the people of this nation with a recognized concept of the right of every citizen to better health. This was named "Health to all by the year 2000". The health refered to here is far from the concept of health as being a state of absence of disease or infirmity, but is viewed as a state of complete physical, mental and social well-being. The requirements of this objective therefore include:

- the promotion of health of people in the country
- the prevention of illness and disability while they are at primary stages, before they become a public health problem,
- The rehabilitation of individual citizen to the level of health which enable him to enjoy and maintain his living as well as his rightful place within the community.
- The reduction and subsequently the removal of pains, sufferings and deformities as well as the restoration of health to enable individual citizens achieve personal, cultural and economic goals.

Though the Federal, states and Local governments have these objectives in mind for long, the rate of improvement in the health status of the nation is so slow. Preventable diseases are successively prevelant and inadequate population coverage by the existing Medicare services cannot be overemphasised.

About 80% of the population in Nigeria are peasants; that is they rely solely on farming for subsistance. The welfare of these peasants is therefore expected to be of major economic importance to the nation. Ironically this is far from being the case, for the peasants remain underpreviledged, illiterate and poor with least access to the few Medicare facilities provided by the government. This apparent neglect towards the provision of adequate medicare services to the peasants has lead to the undesirable rise in the spread, occurence and reoccurence of diseases resulting into the reduction of the output of the toiling peasant.

What the poor peasant needs are Medicare services he can receive at his natural environment. He needs the health personnel he could disclose the secrets of his heart on matters concerning sanitation, food problem etc. This would reduce the infant mortality rate and maternal mortality rate, the country will then grow stronger health wise and economically.

For achieving the above goal, it is necessary for the peasant to share the responsibility of providing the most needed medicare facilities with the governments. This calls for partial or full participation of the whole population. The construction of private clinics and chemists which are profit oriented is more or less not in the required direction. They are in the towns and cities and provide only curative (secondary) medicare. So the participation should be a form that will reach the deep rural areas, and with both primary and secondary medicare services integrated together. This is because the success of the latter depends solely on the efficiency of the former.

Bringing both curative and preventive Medicare services under the same administrative and Architectural roof is among the main objectives of this thesis.

A provision of this nature will motivate the peasants in the rural area to participate in the medicare provision for his own self. It will allow him to build his own dispensary which can then develop into a comprehensive health centre - as a stage following the rural hospital. It possesses less intensity of medicare and technical services than the rural Hospital. The participation of the peasant provides him not only with the medicare services satisfaction but also with a feeling of belonging towards the facilities.

The programme therefore require a design with maximum flexibility units since the medicare provisions are growing units with organic nature. The solution should therefore be an organic one rather than fixed, as the former can be carried out easily with maximum efficiency and minimum skill and cost.

When this scheme is in operation, the peasant can start building their own medicare building from any of the three; the Dispensary, Health Sub-Centre or Comprehensive Health Centre.

The first chapter of this thesis provides the reader with the actual meaning of the peasant being provided with the medicare services, his socio- economic position, behaviour towards medicare facilities provision and his other personal problems.

The organisational set up and planning of existing Health facilities and finance are among the things discussed in the second chapter to give the reader the actual picture of the existing situation. Some informations and ideas obtained from primary sources are also presented in chapter 3. These informations were derived through studies of existing structures both within the country and abroad serving similar functions as those proposed by this thesis.

Another important part of this thesis is the 'PATTERN LANGUAGE'. The pattern language was originally applied to the design of Multi-system Centres (M.S.C.) by its author, Christopher Alexenda. The author of this thesis has attempted the application of the pattern language to hospital design that could suit different sites, functional requirements, climatic and socio-economic conditions.

The last part deals with some site considerations necessary for siting hospitals. A site was chosen by the author for an examplary siting of the comprehensive Health Centre that was assumed to have gone through the lower two development stages of medicare services. Climatic and micro-climatic analysis of the site were conducted and reported including a general site consideration guideline for choice of site in any other place. The technical considerations made concerning the building contruction and water services also came under this part. Accommodation schedule and a method of space analysis and allocation to different functional areas of the Medicare services were discussed in this part.

Some conclusions were derived from the studies and preposals were stated in the last section of the last part of this book.

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1. Page 78 is the continuation of Page 76

2. Page 100 is the continuation of Page 89

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The mistakes are deeply regretted.

CHAPTER ONE
THE PEASANT AND HIS PROBLEMS

1.1 Identifying the Peasant

The success of any project involving any society is largely affected by its mode of life, which is an expression of the economic and socio-cultural structures of that society. Hence, the study of the generic cultural and socio-economic behaviour of the peasant that this thesis aims at providing Medical-care for is necessary. Anthropologists have written alot about the peasant, but my understanding of who the peasant is revolves around a common definition:

> "The small holding peasant is the owner or tenant - particularly the former of a patch of land not bigger as a rule than he and his family can till, and no smaller than can sustain the family" 1

From the above definition one can say that the peasant depends solely on farming his land for sustainance and is more or less a small-scale farmer. This suggests or points to the fact that peasants are generally poor and live in the rural areas. Some anthropologists expanded this definition to cover the livestock produce as it also falls within agriculture. In the final analysis we see that the peasant dominates the agricultural labour force of Nigerian

society, and they form the majority of the population. For the peasant, the main capital is his arable land so any attempt to tamper with it is met with utmost opposition.

The mass of peasantry can be divided into three main groups.

(i) The bottom group: This group consists of the peasants that have no or insufficient land to sustain them, so they earn part or whole of their living by selling their labour to those that have excess land.

(ii) The Second group comprises of the poor small peasant farmer who just makes the two ends meet solely by tilling his own land. Among this group are some that have bare surplus over the amount sufficient for their subsistance. This group is the middle land owner group.

(iii) The third group is the well-to-do peasant farmer who own more land than he and his family can till, so has to exploit the labour of the bottom group, employing them as holding farm and day-labourers. The farming system of this group today involves mechanisation of one kind or another. This group are generally the rich in the rural community they live.

1.2. Socio-Cultural and Economic Position

In any society there is stratification of one kind or another between different categories of persons, ranging from the highest full status as members of the community, able to bear social responsibility and commanding social rights, and relegating the lowest category[2]. Though social status or class stratification varies from tribe to tribe in Nigeria, the general macroscopic social status group can be easily divided into three, particularly in Kaduna state.

1. The 'Upper Class' which includes the traditional rulers and high ranking government officials;
2. The Middle Class consists of the wealthy Merchants and farmers and people of religious eminance;
3. The lowest group include, the craftsmen, the poorer peasant farmers and the menial clients.

The rulers have so high a status that they bear no comparison with anyone else. The leadership is on heridity. This group is generally within the 'top-group peasants' mentioned in the first part of

this chapter. This is because their status puts them in a position of being able to delegate much of the responsibility for the day-to-day management of their farms to clients or hamlet heads (where the ruler is in the urban area or the medium-sized village), 'In this way they escape the limitation of the labouring system'[3]

The wealthy marchants and farmers comprising the 'middle class' are primarily occupied as farmers but in most cases supplíment the farming with some non farming occupations both during and after, the rainy seasons - particularly the latter, for earning of significant incomes.

The people of religious eminence, though they also farm (directly or indirectly) concentrates more on the teaching the religion to their pupils, whose age range from 4 years to adult. They are consulted for spritual helps but do not contribute in active public service. They are respected for the knowledge they possess.

The lowest group form the poorest part of the society but may rise to the middle class as their income increases. This is least noted among the poorer peasant farmers. This general poverty is caused by so many reasons, some of which are:

(a) The brevity of the farming season, which is most noted in the northern savannah

(b) Unreliability of rainfalls

(c) The under utilization of labour resources; this minimizes the supplimentation of income either by growing special crops or by bursing remunerative non-farming occupations.

(d) Capital shortage; There are few other businesses in the villages that enable an individual to build up capital during the course of his working life.

(e) The decline of the craftwork; A few traditional crafts known to flourish in the past, e.g. Smithing for traditional type of farm tools etc; are being slowly replaced by manufactured tools and other skilled craftsmen as weavers and dyres are suffering from competition from manufactured goods

1.2.1 The Peasant Economy

Production by the peasant is aimed at satisfying culturally defined needs. He produces food and cash crops for the market because he cannot satisfy his needs by operating only within his socio-cultural milieu

The money obtained from sales in the market is in turn used to purchase the commodities necessary for his day - to - day life which he cannot produce, as salt, fertiliser, cloth; meat, etc.

This shows that, though the peasants generally live in deep rural areas, their lives involve the market system, which gives rise to consequent interdependence with the urban and sub-urban structures. As farming is seasonal, some peasants are also found in varying types of occupations (small scale as a rule, due to limited capital) as craftsmanship, brokers, small trading, Building, carpentry etc. The farmers that are previlaged to have their lands close to rivers and all seasonal lakes are involved in horticulture. They produce in the vegetables and fruits which they sell in the market as a smppliment to the grains they produce. So the production of the peasant is not for consumption need alone but also for sales in the market as a source of livelihood.

There are several kinds of peasant economies throughout the world. For example (a) the peasant in Spanish colonial America provided labour force and the mineral wealth for Spanish colonial economy while others supported urban and city economy and society in

Northern Columbia (Venezuela), and in Coastal Ecuador by growing cocoa or bananas.

(b) In Malaysia and Indonesia a peasant economy of fishermen operates where different market organisation dispose of dried, fresh or cured and cooked fish. But cured fish is also stored against the periods of bad weather and scarcity[4].

(c) In China and Japan, the peasant fisherman is lent money for boats, and nets and other goods as food, cloth and he gives his catch for a period of time to the lender. In this case, the produce of the peasant fisherman is monopolised but he is also saved from looking for buyers.

(d) In Northern Nigeria, the peasant farmer is given some money to buy fertilizer and improved seeds during the rainy season and he in turn pays after harvest with grains equivalent to the amount lended for the latter and the money for the former.

(e) In some cases, a single trade venture integrates economic activities in the traditional and modern spheres. An example in Nigeria is cattle production and distribution, it links nomadic Fulani and rural Hausa cattle owners and middle men trader in Northern Nigeria with butchers and consumers in southern

Nigeria. Conversely the Kolanuts trade links the Yoruba producers to Hausa consumers

1.3 Types of Peasant Settlements:

There are many types of peasantsettlements, depending on the part of the world. Whereever it may be, one basic fact is that the peasant's dwelling is always as close to his land as possible since he rarely possess any other means of reaching the farm faster than his legs or animal .

In Kaduna state there is a mixed form of settlement. It is a type of settlement in which medium-sized villages are surrounded by hamlets and farms, with each hamlet containing a few inhabitants. These medium-sized villages normally have a group of elementary social services as shops, primary school, in the previlaged a dispensary etc. The average dispersion of villages may vary with fairly wide range, but it is nevertheless dependent upon the density of population required for working the arable land. Some hamlets may be very far from these medium-sized villages. Most of these hamlets are linked to the medium-sized villages with foot paths and the medium sized villages are linked to the bigger villages with seasonal motorable roads. See map of Dutsin-ma Local Government area.

This part will not be complete if the nomadic Fulani in Kaduna state are not mentioned. Their periodic migrations in search of pasture for good grazing is notably in the decrease. This decrease is in the sense othat the migrations do not include the whole family. Nowadays the main heart of the family stay in an established farm dwellings. The younger men go to places with better grazing lands with the flock. The rest of the family remains there for all seasons, farming small lands for subsistence, and occasionally sell the surplus in the markets for purchase of other necessities of life. They also sell the eggs from their fowls and milk of the few breeding cows they keep at home. In Dutsi-ma Local Government area, the Fulani take their cattle to the forest near Kunka (Dajin Kugu). The younger men sometimes go with their wives to the grazing places who sell the milk from the rest of the flock. Note that there is some co-ordination between the flock far away and the base of the family.

1.4. Medical Facts About Rural Areas

In the peasant settlement where the main activity is farming, the journey of the peasant to urban areas are very rare. Where the need for things not available in the hamlet arises, the journeys are only to the

Medium sized villages within his immediate environment. Only a small percentage go to the urban areas; they go only on particular days (say market days), depending on transportation as well as the mode of marketing in that urban area they visit. Due to this fact, the peasant has few occasions for travelling. This makes going to hospitals in distant towns appear to him as an adventure and it arouses certain fear and hostility complexes. The peasant would rather consert to the treatment he receives from the small dispensary in the medium sized village (if any), or from the traditional healer. The problem is further aggravated by psychological factors coupled with religious and cultural prejudices. Many of these peasants in deep rural areas still place more confidence in the methods of their own traditional healers.

Deaths are not uncommon because the peasants most often than not tries the traditional healers first, it is after they have lost confidence in the healer that a patient is rushed to the hospital, and they might reach the hospital when it is too late to save the life of the patient. This stresses the need for moving the medical care closer to the peasants.

The Seclusion of the women in the Muslim society causesthe rejection of hospital treatment unless there is a strict segregation of sexes in the hospital. This is rarely overlooked even in time of necessity.

Another problem arises in the hospitalization of children. In most African countries, Nigeria inclusive, no mother will agree to leave a child under four years of age alone in the hospital; she will insist on either her or a close relative remaining with him throughout his stay or the treatments following the first would be forfieted and this may result to the death of the child, depending on the seriousness of the illness. As the staying of the mother with the child in the hospital may help in saving the child from developing some psychological strain, the stay can thereby by exploited by giving her some health education lessons and showing her the correct methods of child care training and hygiene. This requires a high quality staff in order to avoid bad tempers and confusions.

As for the maternity services, the peasants still have confidence in the local midwives whose obstetrical attendances on the mother are bound to aggrivate any previous uterine infections.

Considerable improvement is being achieved by giving these local midwives some medical training by professionally qualified modern midwives (preferably those from the same locality). The traditional midwives are thus exposed to more hygienic methods of aiding pregnant women before, during and after confinement. An unhealthy surrounding could help the occurance of umblical tetanus which is the cause of so many deaths among new born babies after a relatively normal uncomplicated deliveries. Aneamia due to dietery deficiencies and post-partum haemorrhage also causes many deaths. The training will go a long way in the reduction and consequent elimination of these causes of deaths and infections.

1.4.1. Disease Attendance and Response

A considerable amount of time was spent by the author in making a study of the most common prevalent diseases in Kaduna state, a deeper, analysis of Dutsin-ma Local Government area in the state was conducted. This is because it is the area the author has chosen to examplify the theory of the Medicare Centres presented in this thesis:

See Table 4

The systematic survey shows that most of the people harbour more than one disease. An example is that most of the peasant women treated suffer from not only gyneacological infections or prolapsus but both, simultaneously in different degrees[5]. The former being caused by frequent sexual relations and childbirth in close sucession while the latter is partly caused by the habit of carrying loads on the head from an early age (carrying loads on the head is very common in the deep rural communities).

Gastro intestinal infections and nutritional deficiencies are wide spread. In fact they are responsible for the alarming rate of infant mortality increase. "Over 100,000 children die of measles in Nigeria"[6]. Statistics have also shown that about half the total deaths occuring through sicknesses other than accidents occur among children under 10 years of age with half of this occuring during the first year of life[7]. This high infants mortality suggests the need for provision of proper paediatrics department in the Medicare Centres.

The main cause of the nutritional deficiencies is not because the peasants do not have nutritious food, but because they sell the most nutritious food in the markets ardin turn buy some less nutritious ones. For example, a peasant may bring chicken, eggs, beans, vegetables and the like (rich in protein) for sale in the market and buy cassava (carbohydrate) or even less nutritious things to eat. This could be reduced with adequate health education.

Intestinal parasitoses are aggravated by the poor water supply and sanitary conditions of the rural areas.

> ".....,, rural communities in under developed and densely populated areas present sanitation problems of such magnitude that, at first sight, there seems only one possible solution: to burn down the villages and rebuild them differently"[8]

Water is supplied by wells or streams that are constantly contaminated by animal and human excreta. Waste matter and excrement are thrown into the streets for dogs, cats, birds etc to dispose of. Manure is mostly kept inside or immediately outside the village, and the mode of transportation to the farms is in baskets or carts which are far from being leak proof.

The question of pandemics is less sombre in the present day medicine due to relentless efforts by the Ministry of Health in conjunction with the World Health Organisation.

However, this does not mean that all epidemic diseases have been eliminated, in fact some supposedly eliminated epidemic diseases re-occur. For example, cholera that was said to have been eliminated last two years occured in the Federal Capital Territory, Abuja this year (1984) killing some epeople[9]. This was said to be due to the presence of illegal immigrants from neighbouring countries that have not been vaccinated.

In campaigning for the use of Medicare centres, the leaders of the peasants (the rulers) have to be used. This is due to the high respect the peasant has for his leader as pointed out in the first part of this chapter. A peasant will be more willing to go to the hospital if the hamlet head advices him to go than if a health personnel offers him transport to and from the Health Centre, especially if the hamlet head disapproves such a move

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CHAPTER TWO

THE ORGANISATION OF HEALTH SERVICES

The purpose of the Health care sector of every nation, rich or poor is to pursue a mission of promoting protecting, restoring and improving the health of all the people of that nation with a recognised concept of the right of every citizen to better health. This is because the efficiency of every person depends not only on his skills but also on how healthy he is physically, mentally and socially. In other words it is a healthy people that make a healthy nation.

The Federal and state Governments in this country therefore take the provision and planning of medical and health facilities as their responsibility. These facilities are said to be planned with the aim of giving the required medicare services and education to the people, especially those in the rural areas.

2.1 Curative and Preventive Medical Services

Drawing a distinctive theoretical line between curative and preventive medicine is far from being an easy task[1]. This is because part of the preventive medicine in itself can be seen as a type of early diagnosis, and diagnosis takes place in the curative

medicine; hence, they are inter woven in various parts of medicine machinery.

2.1.1 Preventive Medicine

Preventive medicine can be said to be that part of medicine that combats the occurance and reoccurance of those diseases that are preventable. It deals mainly with health education to improve the environmental conditions of the people with a view to creating an environment that is not conducive for the spread of any form of communicable diseases and also to minimise domestic accidents with particular attention to burns. A more elaborate discussion of preventive medicine is presented in chapter 4 under "The pattern language".

2.1.2 Curative Medicine

This is the form of medicine that concerns itself with the removal of any disease that occur to or within the body. The sole aim is to bring the ill body back to or as near as possible to normalcy from the point of view of health.

Curative medicine can be divided into two:

1. The Out Patient Clinic;

   This takes care of the treatment of mild illnesses as fever, sepsis, upper respiratory infections, minor trauma, uncomplicated urinary infections etc.

ii Hospitalization Proper:

The patient here is in such a condition that he requires a closer and more frequent observation by the medical personnel. He is then given a bed for a certain length of time during which he is closely supervised and all the necessary services for restoring his full health are provided. This may include among others, emergency, surgical; radiological and pathological investigations.

The curative medicine comes into play only when a person is already sick but does not pay much attention to attacking the root of the occurance.

2.2 Existing Health Services Organisations

The planning of health services in Nigeria as earlier on stated, rests on the Federal, State and Local Governments. The present planning operates on referal system. In this system a sort of ladder of medical units is formed according to the scope of medicare services each unit in the ladder provides.

The ladder has the dispensary at the lowest step with the specialist or teaching hospital at the peak which is reached by subsequent references from the units in the lower parts of the ladder.

The ladder is given below in the ascending order:

1. The dispensary
2. The Health Clinic
3. The Rural Health Centre
4. The General Hospital
5. Specialist or Teaching Hospital

The Federal government concentrates on the provision of the specialist Teaching Hospitals. These Hospitals apart from providing complete range of specialized medical care various branches of medicine also provide facilities for clinical research work and clinical training of doctors of general medicine and simple surgery. The Federal Government also establishes research centres for research work on specific branches of medicine. An example as the National Institute of Tripanesomiasis Research at Kaduna. This Institute conducts research on Onchorrerciasis (River Blindness) and sleeping sickness[2].

The other medical units lower in the ladder are provided by the state and Local governments. The state governments provide the General Hospitals, Rural Health Centres and Health Clinics leaving the dispensaries Health Offices and Leprosy control programmes to the Local Governments.

Though the co-existence of preventive and curative services is very important for the successful building of a healthy nation, these two virtually function independently in the present system and are only rendered at the local government levels by the health offices - attached to some of the dispensaries physically but organisationally seperated. The medical units upper in the ladder concentrate more on curative medicine. Some of them also offer ante natal services while others have the ante natal services at different points in the towns.

As one goes up the ladder, the scope of the curative services widens from ordinary general medicine in the Health Clinics and Rural Health Centres, to common specialties in the general Hospitals.
Some general hospitals are very small while some may reach up to the capacity of over 500 beds (example is the Murtala General Hospital Kano). Such big hospitals also offer training facilities for nurses and other para-medical staff.

2.3. Health Planning in Relation to Economic and Social Development

Financial, social and economic conditions have decisive influence in developing and deciding the type of Medical care system to be provided to any community.

Closely linked with these are the transport facilities, since the attitudes of a rural community to Medical care largely depends upon the volume of cultural and economic exchanges between the town and the rural area[3].

As previously stated, civilization in peasant settlements is far from being advanced towards medical care and the economic situation is predominantly precarious. The political and social structure of these people has not yet been able to assure the population of an income large enough to break the vicious circle of poverty and disease.

For a people with these characteristics, the provision of Medicare services priority is given to a series of general health measures with a view to removing the threat of epidemics and reducing the incidence of endemic diseases. Curative services should be organised in conjunction with preventive in order to justify in the eyes of the peasant population the action undertaken in the fields of public health.

At the early stage no financial contribution may be asked from the peasant, and the whole medicare services; the operating, building and equipment expenses will be assumed in full by the government, but the peasant should be aware that the health services

placed at his disposal are part of the tax he pays that comes back to him in this form.

As the awareness of the uses of the Medical care services develops, gradually a stage is reached when the peasant would be ready to contribute to the financing of Medicare services in one way or the other. An all-round experienced Medical and Nursing staff is necessary at this stage for fruitful results.

This stage is already being witnessed in some rural areas, where the peasants contribute in the building of their own dispensaries and the government provides the running facilities of the dispensary, unfortunately the contribution stops with the contribution stops with the construction of a dispensary. This is because the peasant doesn't know of any intermediate stage between the dispensary and the general hospital, so he always thinks that he has reached the peak of the contribution he could make and the rest, that is the contruction of General Hospitals is the responsibility of Government. This is where the programme this thesis is proposing comes into play. The peasant will under this programme be able to gradually increase the size of the initial dispensary up to a comprehensive health centre or even a comprehensive health centre or even a District Hospital in future, depending on the improvement of their economic condition, medical needs and dedication towards that goal.

The success of a dynamic programme like this lies heavily on the proper co-ordination between the Health Management Board of each state and the peasantry. The Health Management Board will seek the advice and participation of any specialist body whose services are needed for the progress of the programme in all its facets. These specialist bodies may include; Architects Builders, social Scientists, Bankers etc; in order to create most favourable conditions for the programme.

> "For many years to come, the world will continue to harbour many different philosophies, cultures, and systems; hence, hospital programmes, which reflect so closely the essential features of the style of life, will have to be carefully adapted the diverse conditions prevailing in individual regions" 4

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CHAPTER THREE

CASE STUDIES

A study of some existing hospitals, health centres and dispensaries within Nigeria and outside was conducted to enable the author acquire the necessary data for comparisons and eventually deduction of some facts about the work-loads of medical personnel, most prevalent diseases in the medical areas of Nigerian cases and their effect in the rural areas. The study also furnished the author with the architectural problems and solutions the case studies could offer.

3.1 General Hospital Dutsin-ma

This Kaduna state government owned general hospital is built on a gently sloping site within Dutsin-ma and expanded to its present capacity of 107-bed general hospital. The growth took place between 1971 and 1983. The hospital has an annual attendance of over 236,000 and bed occupancy is always over 100%. (See table 1).

The 107 bed nursing unit accommodation is distributed as below:

a) A 12 bed maternity ward

b) A 24 bed female ward

c) A 24 bed male ward

d) A 12 bed male accident ward

e) Two 12 bed children wards

f) A 13 bed amenity ward.

dutsin-ma general hospital.

legend:

1 records office.
2 male general waiting
3 female general waiting.
4 female consultation.
5 male consultation
6 peadiatrics consult.
7 male injection
8 female injection
9 minor theatre
10 dressing room
11 dental clinic
12 x-ray & unit.
13 laboratory
13A lab store.
14 pharmacy
14A pharmacy store
15 emergency unit
16 emergency isolation
17 ante natal clinic.
18 labour room
19 nurse workroom
20 maternity ward.
21 children ward
22 female ward
23 male ward.
23A male accident ward.
24 operation theatre.
25 laundry & kitchen
26 amenity ward
27 mosque
28 male & female toilets
29 patients toilets, baths
stores etc.
30 mortuary
31 store.
ambulance parking.

scale: 1:500

north.

to the staff

The two male and female wards each with 24 beds are each divided into two sections, one 12-bed section for medical patients and the other 12-bed section for surgical pa patients. Each ward has its nurses's station positioned at the end of the ward with proper glazing to allow easy observability by nurses from the same sitting position (see fig. 3.1). The two 24-bed wards have their nurses' station in the middle of the words, with their sanitary accommodation at the left end of the wards. The other wards have their sanitary accommodation outside the wards but easily accessible to the patients. The wards are sparcely located on the site and joined by long corridors. The amenity ward has no corridor connecting it to the rest of the hospital. Non ambulant patients are transported on stretchers and not troleys.

There is a small operation theatre, situated along the corridor joining the children, female and male accident wards together. Only uncomplicated surgeries requiring local and spinal anaesthesia are conducted. Operations involving short-time general anaesthesia have recently taken off in the theatre. This is due to the high load on Katsina general Hospital.

The Out Patients Department (O.P.D.), stationed at the fore-part of the hospital, is a single stretch but

functionally divided into four. If we start from the left· the first is the 'Female section, the second is the male section with pharmacy and laboratory· the third is the Paediatritrics/emergency section while the fourth at the extreme right is the ante-natal and maternity section. There are seven consulting rooms so to say, with the following distribution:

- 2 male consulting rooms
- 2 female (gynecology) consulting rooms
- 1 paediatrics (children) consulting room
- 1 Dental clinic
- 1 Eye clinic

The dental clinic functions twice a week, when the dentist visits the hospital. The eye-clinic room used to be the female dressing room.

The first section of C.P.D. consists of a large female waiting area, eye clinic and dressing room for both sexes, a minor theatre, 3 injection rooms (one for male and the other for females), dental clinic, 2 female (gynecology) consulting rooms, an x-ray unit a record/registration office serving both male and female patients at the same time and The Principal Nursing Officer's office.

In the second section there are; male waiting area (about one third of female waiting), 2 male consulting rooms, pharmacy unit consisting of a room for preparation as well as issuance of medications to patients and a drug store which also serves as the pharmacist's office, a laboratory with its store; adjacent to the consulting rooms are 3 W.Cs, one for staff male and female, one for male patients, one ofor female, patients. This is mostly used by patients from whom specimens are needed in the laboratory.

The third section is composed of a paediatrics consulting room, an emergency department consisting of consulting room, department/observation rooms and a store; the plumber and electrician each has a room a store within this unit.

The fourth section comprises of ante-natal clinic (2 rooms), a labour room with W.Cs close to it, nurse workroom, a maternity ward and sanitary accommodation for this ward which end the right side of the wing.

The laundry and kitchen are under the same roof, each with its store. They are generally close to the nursing units and particularly the amenity ward. There is a generator house about 45 metres from the left end of the O.P.D; close to it are the out Patients Department toilets (latrines).

A mosque is also provided within the hospital. A new administrative block has been constructed recently as all rooms have been occupied by the main gate without going near the O.P.D. (see fig. 3.1). Vehicular movement is restricted to areas away from the O.P.D. The public parking is positioned just after the main gate Only ambulances, and staff vehicles are allowed beyond the public parking area. The staff parking is close to the mosque.

The following merits and demerits were observed in this case study:

Merits

1. Looking at the initial layout of the Hospital communicates a fact that it was designed for expansion;
2. All units that receive patients and supplies from outside the hospital are easily accessible from the main gate.
3. The architects have combined both male and female record/registration room, maintaining the seperation of male and female patients.
4. Each ward is easily controlled by the nurses by convinient positioning of their workroom.
5. Good vehicular movement control
6,. The 15m span of the O.P.D. (female section) has been covered using simple low pitch timber trusses on columns.

Merits

7. The staff housing is very close to the nursing units and the hospital as a whole, this simplifies the calling of personnel on duty within the shortest time. The housing has its seperate entrance.

Demerits

1. Maternity wards and labour room are exposed to both morning and evening glare intrusion as their long axis is along North-South.
2. The toilets of female wards are too close to the Operation Theatre, this could cause a lot of havoc and has made the extension of the theatre towards that direction impossible.
3. The Operation threatre is to small for the functions it now performs, particularly the changing room which is small and for both doctors and nurses.
4. Protrution of columns into the corridors of C.P.D. obstruct smooth circulation of corridors users. This difficulty is increased where a trolley or stretcher is involved.

5. Ante-natal clinic is badly positioned, as the patients in the labour room are in full view of the ante-natal patients. This increases the anxiety of the patient in the Labour/Delivery room and creates a feeling of insecurity.

6. Generally storage facilities are not adequately provided for

7. The X-ray, Pharmacy, Laboratory and labour rooms are all too small for the present needs of the hospital.

8. Though the hospital was initially designed for expansion, the extension made now are in conflict with the initial expansion plan.

9. Non landscaping of the courtyards has reduced their function and encouraged their conversion into foot paths.

10. The mortality which used to be away fro the patients' view is now in full view of the children and male wards but is still accessible to vehicles .

3.2 BATSARI GENERAL HOSPITAL

This hospital that took off as a rural health centre with a capacity of 26 beds in 1978 currently has a capacity of 64 beds. Courtyard system was adopted in the design of the initial complex.

The present attendance is to the tune of 32,000 patients per annum with an admission of over 3,200 annually and a bed occupancy rate of over 100% (See table 2).

The extension of this complex took place only on the nursing units, all other functions remained unchanged in magnitude. The nursing unit now consists of:

- 2 10 - bed male wards
- 2 10 - bed female wards with a
- 4 - bed isolation ward for female
- one 12 - bed children ward
- one 8 - bed maternity ward.

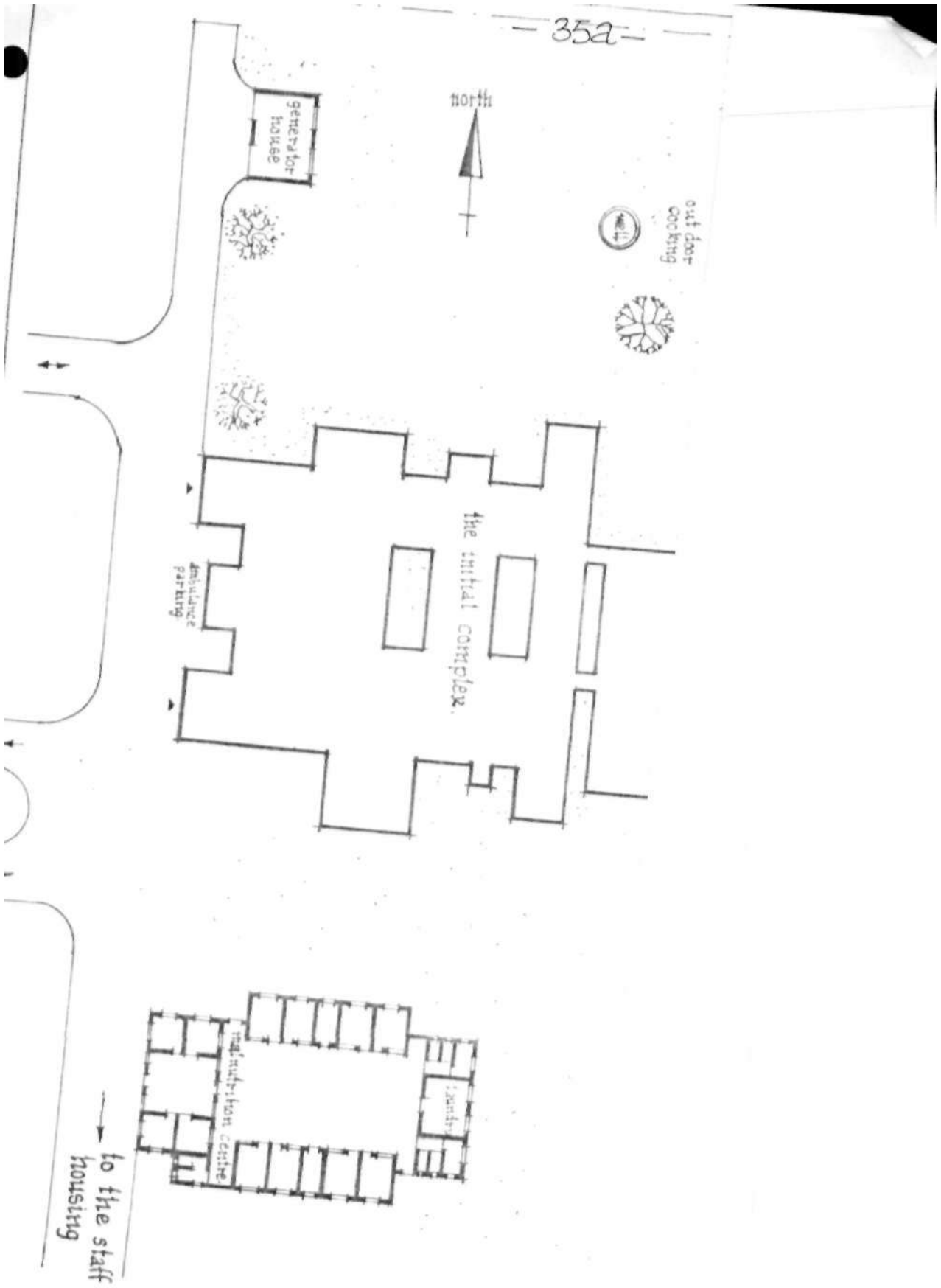
The Out-Pateints Department (O.P.D.) has two record/ registration rooms, one for male and the other for female and children under school age (6 years). There are in all 6 consultation rooms, two for male, 2 for female, one for both male and female; this is where complicated cases are refered to the physician by the

staff nurses for diagnosis and prescription; the sixth room is for the ante-natal clinic which is close to the labour room. The ante-natal consulting room also serves as emergency room after working hour of the hospital.

The administrative block of 3 offices is located within the hospital, between the wards and the Operation Theatre which is behind the O.P.D. It is adjacent to the male wards and directly linked to the female ward.

The Maternity Ward is situated adjacent to the Labour Room. The sanitary installations for the maternity and male wards are seperated by the administrative unit. The consulting room for dental cases functions once a week when the dentist visits the hospital, and is located between the laboratory and X-ray unit. The Maternity has on either of its sides, the make injection and treatment to the left and the female injection and treatment to the right. At the extreme ends are the male and female waiting areas.

The children ward is about 25 metres away from the co[illegible], this was donated to the hospital in 1931 [illegible] after opening the initial complex. An [illegible] ward is now under construction about 15 meters from the children ward. The mortuary is at the extreme [illegible] hospital.


north
generator house
out door coching
the initial complex
partial
to the staff housing

Batsari town is yet to be blessed with pipe-borne water, so the water cistern W.Cs are not now being used. Male and female latrines have now been built behind the female wards, which is not very far from the kitchen and laundry. A well close to the laundry and kitchen and supplies the hospital with water. As there is no electricity in the town, electricity is being supplied by a generator located about 30 metres left of the male waiting area.

The staff housing is to the southern part (right hand side) of the hospital but very close to the hospital with a seperate entrance, but easily accessible from the main hospital buildings. The main approach road directly joins the main road to Katsina town.

The hospital is being administratively managed by the chief medical officer who is a physician. He conducts both administrative and medical functions with the assistance of the Nursing Officer who is also a nurse. There are two general medical doctors.

The following merits and demerits were noted in this case study:

Merits:

1. The initial complex reflect an actual rural hospital
2. Most rooms are adequately ventilated with the adoption of courtyard design
3. The dual nature of the out-patient Department shows the architects' consciousness of the religious and cultural values of the people they designed for, which have resulted into the present maximum utilization of the hospital.
4. Spaces within and without the building can easily be cleaned.
5. The female ward, though it faces the west has been protected from the evening glare - by adequate projection of the roof. The projection serves as corridor and is also close to another building that shades the female ward.

Demerits:

1. A harmonious expansion was obstructed by the female ward.
2. Consulting spaces lack the required physical and psychological privacy (See fig.)
3. Pharmacy lack the store it seriously deserves, and the record/registration rooms are far too small.

4. The absence of an emergency unit sometimes forces the nurses to use the dressing room as one when both maternity and other patients arrive at the same time.

YEARLY SUMMARY OF PATIENT MOVEMENT
BATSARI GENERAL HOSPITAL

Table 2

YEAR	O.P.D. ATTEND.	ADMISSIONS	DISCHARGE	AVER. LENGTH OF STAY	% OF BED OCCUPANCY	DEATHS
1980	20,524	2258	2027	9	103.1	75
1981	24,180	2,783	2216	10	98.5	
1982	29,621	3,152	2675	8	101.0	
1983	32,609	3,209	2,783	11	112.0	

Source: Batsari General Hospital, Medical Record Office, Batsari.

3.3. RURAL HEALTH CENTRE, KANKIYA

Kankiya Rural Health Centre was built as far back as 1943 as a rural health centre. Due to one reason or another, it still performs the same function, but now serving a population of over 600,000. This rural health centre has both curative and preventive units within the same complex. In fact the whole centre is being administratively managed by a doctor that is specialised in both preventive and curative medical services.

The rural health centre can be divided into:

(i) Out Patients Department (O.P.D.)
(ii) Preventive Unit,
(iii) Ante-Natal and family health unit,
(iv) Nursing Unit,
(v) Administrative Unit
(vi) Services.

(i) The Out-patients department consists of two consulting rooms, one for male and the other for female, one dressing room, an injection room with store, a laboratory, main general waiting with registration point and a pharmacy.

(ii) The Preventive Unit has 3 offices and a store for storage of medicines, immunisation vaccines and other equipment and materials for their functions. One office is for communicable diseases control and the other two are for sanitary inspectors and health educators.

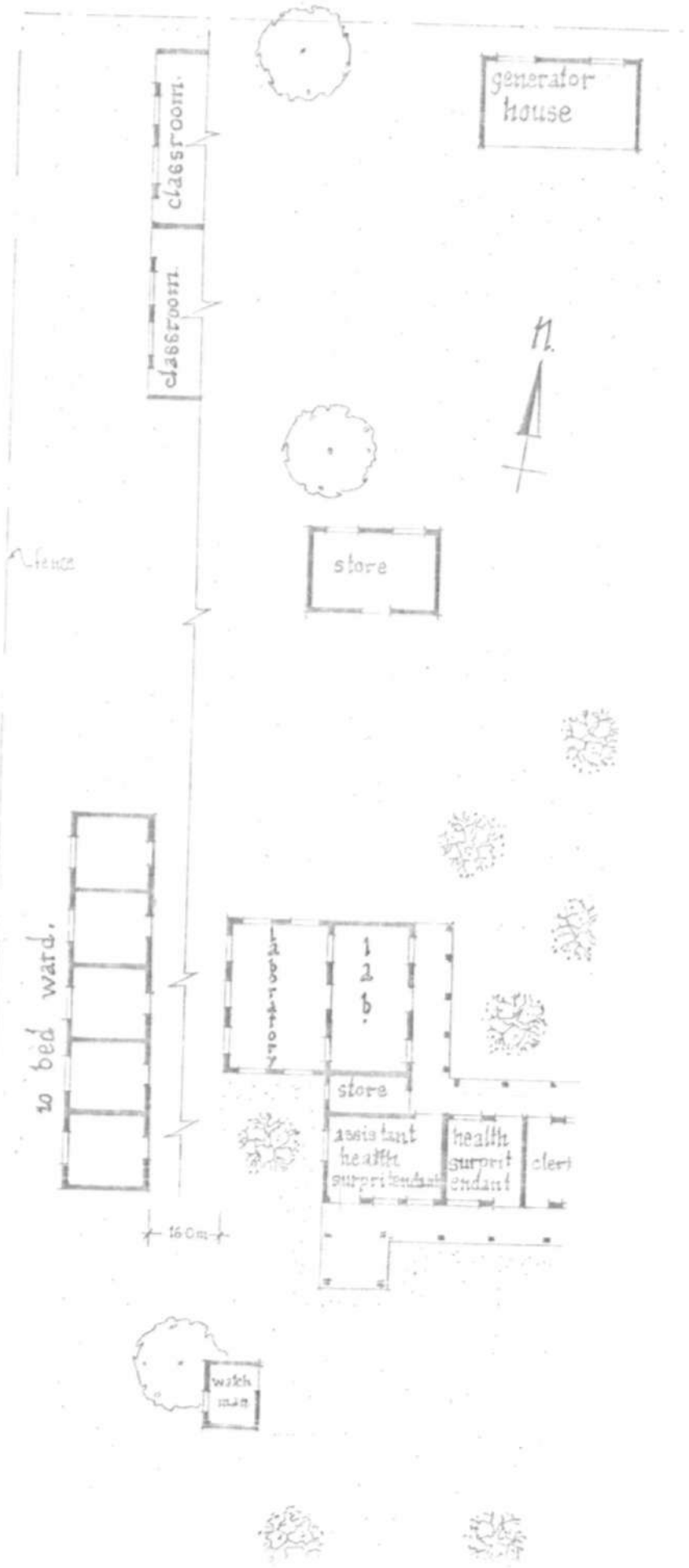
(iii) The ante-natal and family health unit is composed of 2 consulting rooms and one room for demonstration.

(iv) The Nursing Unit consists of a 10-bed ward for both sexes and another two-bed ward for maternity patients. The 10 bed ward is for patients with uncomplicated general medical cases that need 6 to 12 hourly attention and live away from the town. They are admitted there until their conditions have improved when they are discharged. In contrast to the maternity ward, the 10-bed male /female ward has no specific sanitary accommodation so the female patients share the maternity ward sanitary accommodation while the male patients share the toilets for out-patients that is about 25 metres away. The maternity ward is sometimes adjusted to accommodate up to seven patients; four beds within the ward, one patient on the floor in the passage between the ward and labour

room and two patients on the verandah that surrounds the ward (see fig. 3.3) This ward has its own sanitary accommodation and storage close to the ward-with ample space around the ward. This verandah instead of being used as a day space for ambulant patient in the ward is sometimes converted to a ward.

(v) Four offices and a store form the administrative block of the centre. On office for the senior Medical Officer, one office for the health Supritendant, one for his assistant and the last office for clerks. The office of the Medical Officer also serves as a consulting room. We conducts further diagnosis of the patients (both male and female) refered to him and prescribes treatments or transfer the patient either to Dutsin-ma or Katsina General Hospital. Highly complicated cases are refered to Katsina while less serious cases are refered to either of the two hospitals depending on the convenience of the patients relatives.

Rankia rural health c



(vi) There is one general store that is centrally located, it receives and supplies all kinds of goods to the different units. A kitchen and its store are situated near the 10-bed ward. There are 3 generator rooms but only one is functioning at the time of study. A mosque is situated near the general store with a well nearby. All toilets are pit latrines as there is no pipe-borne water available in the town.

It is practically impossible for any human being to create anything without a shortcoming no matter how small it might be, below are some of the merits and demerits of this rural health centre:

Merits:

1. Very thin concrete columns were used (7.5cm x 7.5cm) for the verandah supports despite the low level of skilled labour at the time of construction.
2. All the rooms are adequately ventilated
3. The main waiting is easily identifiable and accessible
4. The rooms for storages are sufficient
5. The traditional toilets (latrine) for the maternity ward have been well incorporated with the ward without much inconvaniences.

Demerits:

1. No specific sanitary accommodation for the 12-bed ward
2. The dressing room, maternity xnd ward and the 12-bed are all too small.
3. The irregular unplanned expansion trend of the Rural Health centre has resulted into a situation whereby some buildings have to be demolished in order to effect further expansion (see fig. 3.4)
4. Ante-natal and family health section is very uncomfortable due to the material used for the construction (corrugated zinc sheets).

Table 3

YEARLY OUT[illegible] OF PATIENTS MOVEMENT
KANKIYA RURAL HEALTH CENTRE

YEAR	O. P. ATTEND.		DISCHARGE	AVERAGE LENGTH OF STAY	% OF BED OCCUPANCY	DEATHS
1980	33,844	1095	878	4	85.7	12
1981	30,226	1005	920	4	90.1	15
1982	29,945	1152	1040	5	93.5	10
1983	26,897	[illegible]	890	3	89.0	11

Source: Records Office, Kankiya Rural Health Centre Kankiya.

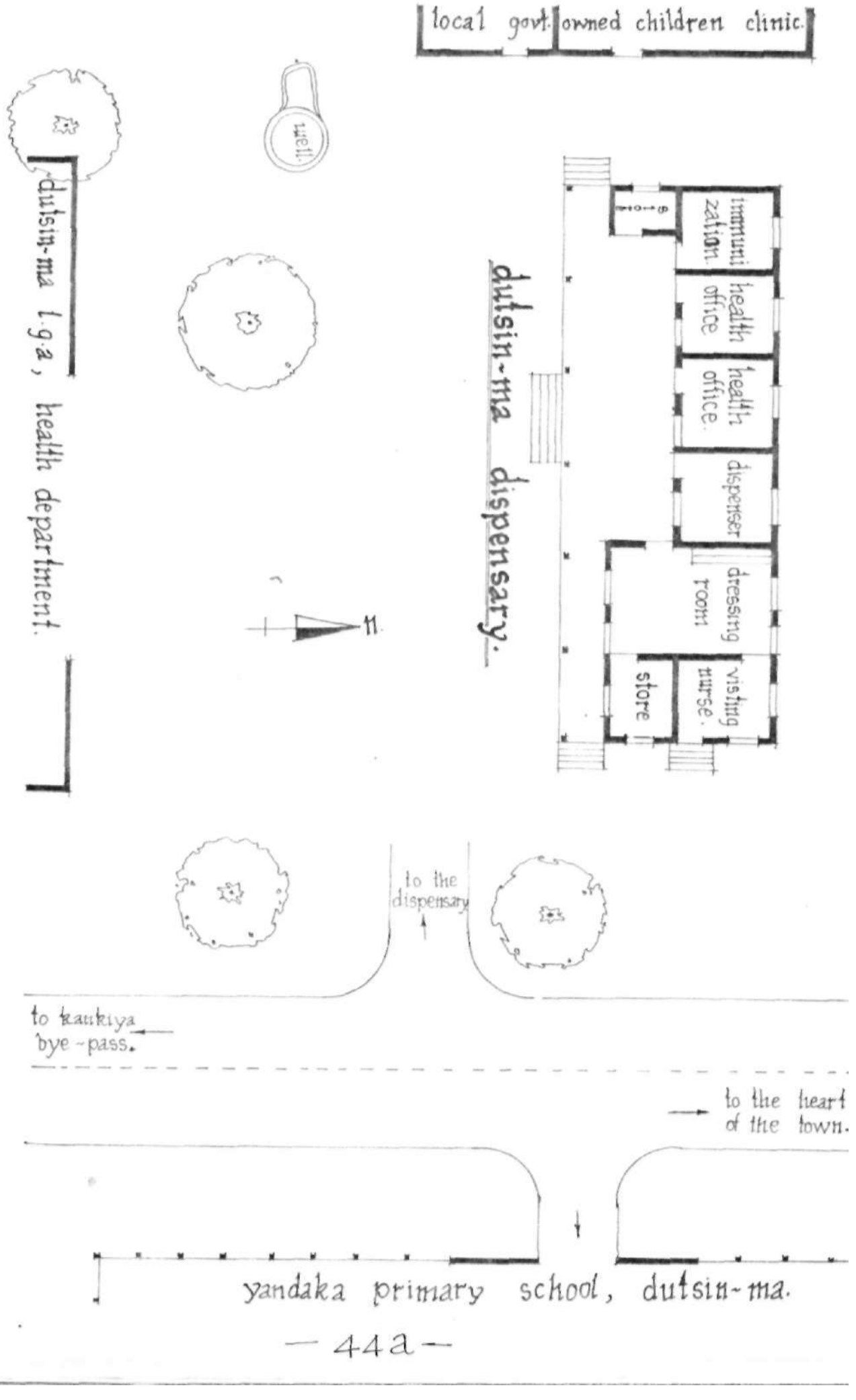
3.4 DUTSIN-MA DISPENSARY

Dutsin-ma dispensary, constructed in 1941 is a good example of a dispensary that both the curative and preventive units are well co-operated with a common approach direction. This dispensary formally had a 4 bed observation unit for patients' observation and treatment plus 2 single bed rooms at the back for isolation of patients with communicable diseases. These buildings have been demolished to give way for the health department buildings of the local government area.

The dispensary is currently comprises of a dispenser's office, a health office, a sanitary inspection office, an immunisation office, a store each for the preventive and curative units, a dressing room adjacent to a room for nurse that need to visit the dispensary weekly for ante - natal services, this now [illegible] an office for health education and welfare [illegible].

Though there is a general hospital in this town, the dispensary still has an annual attendance of up to 13,000 persons. Ninety per cent of the patients are those living within the town. Many of them are [illegible]

fig. 3.5


local govt. owned children clinic.
dutsin-ma dispensary.
immuni zation
health office
health office
dispenser
dressing room
store
visting nurse.
well
dutsin-ma l.g.a, health department.
to the dispensary
to kaukiya bye-pass.
to the heart of the town.
yandaka primary school, dutsin-ma.

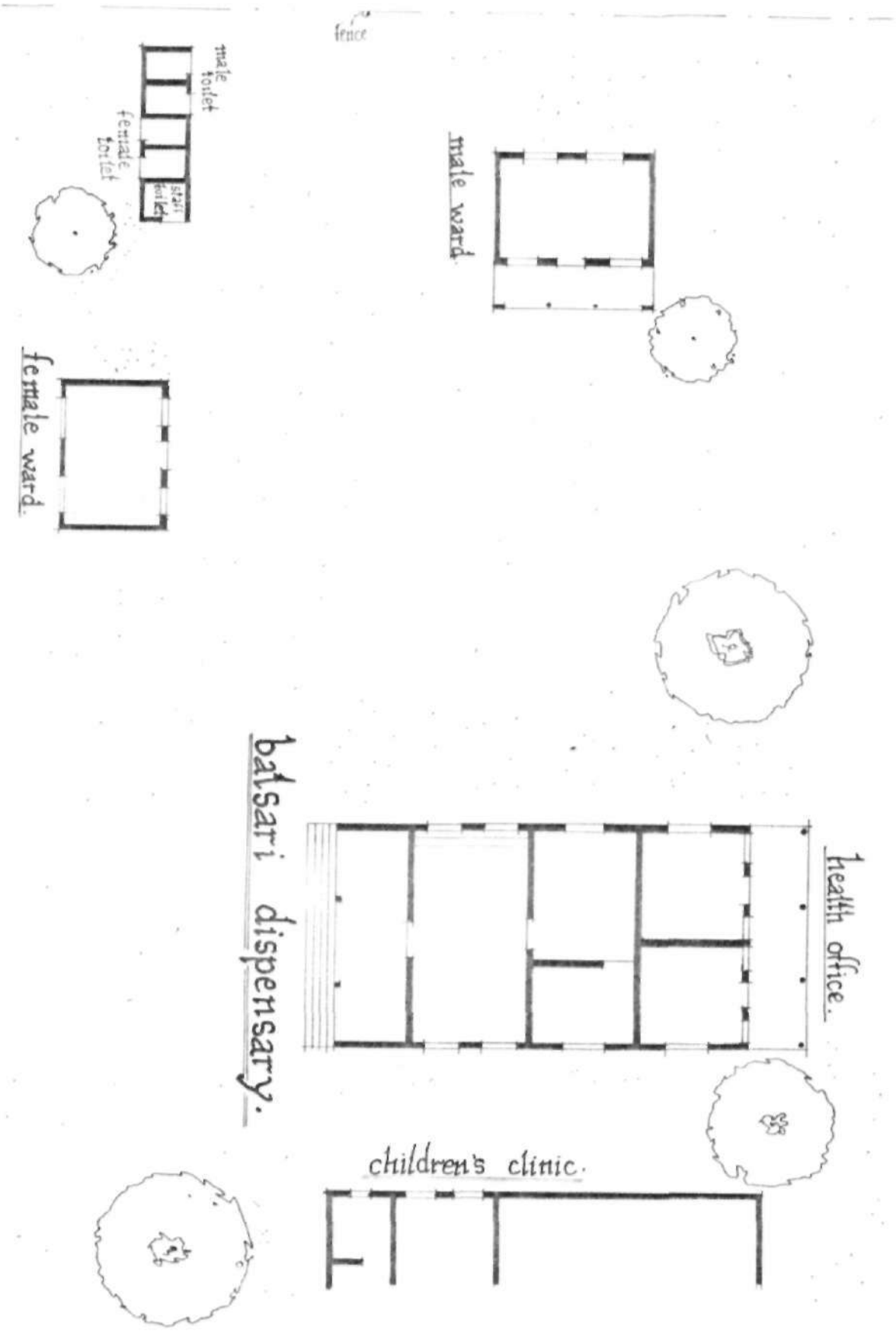
This is because there is another primary school close to the dispensary apart from the one opposite it (see fig. 3.5).

3.5. BATSARY DISPENSARY

This dispensary situated within Batsari town has one office for the dispenser, used as consulting room, one room for injection and storage and the fore-room used for dressing. Local stirilization also takes place in this room. The verandah outside is used as a waiting area . Later two offices were attached to the back of the dispensary to provide preventive services. The team consists of a sanitary inspector heading the town, two immunizers, and two health inspectors/educators.

There are two 2 - bed wards - one for male and the other for female patients that need observation. The toilets are located closer and to the female wards, two each for male and female a toilet. A children clinic has been built but is yet to go into operation. (see fig. 3.6).

fig. 3.6.


fence
male toilet
female toilet
staff toilet
male ward
female ward
balsari dispensary.
health office.
children's clinic.

3.6. MENDOCINO COUNTY HOSPITAL, MENDOCINO CITY, UKIAH

UKIAH CALIFORNIA

This 80 bed county hospital is an example of a hospital that was designed bearing in mind the basic needs of the people. The architects; Stone Marracini and Peterson, worked out a simple and flexible plan, zoned for the needs of the people of the area- at the time of the design. The overall layout of the hospital is well defined into four major areas;

(i) The tuberculosis wing at the left;

(ii) General Nursing wing at the right;

(iii) The link between the two which houses all of the Medical, diagnostic, surgical and out-patient facilities, and

(iv) The service wing which projects out from the front.

The TB wing is a self contained unit zoned away from the [illegible] of the facilities. It contains special observation rooms and very complete facilities of all types needed for treatment of tubercular patients. As may be seen from the plan, the wing may be completely cut off from the rest of the hospital.

(see fig. 3.7) An interesting thing here is that the tuberculosis ward may be converted to general nursing either in part or in its entirety with little effort. This change would then give the hospital the same essential functions as any other general Hospital but this hospital will have more complete facilities than most others of this same size.

The general nursing wing is positioned such that it is shielded from Out-Patients and other type of traffic which is not directly related to the functions of the Department. The unique arrangement in this wing permits the inclusion of two isolation rooms and three psychiatric rooms so placed that this small speacial department has its own entrance.

Central sterile supply is in a convenient location for serving the operating, delivery and emergency rooms, yet can also handle its other demands. The ambulance entrance room is well-located with respect to the ambulance entrance and emergency court. It is completely seperated from other elements of the hospital by a private corridor, yet conviniently located in respect to surgery and other important areas.

mendocino county hospital, Mendocino city.
ukiah, california.

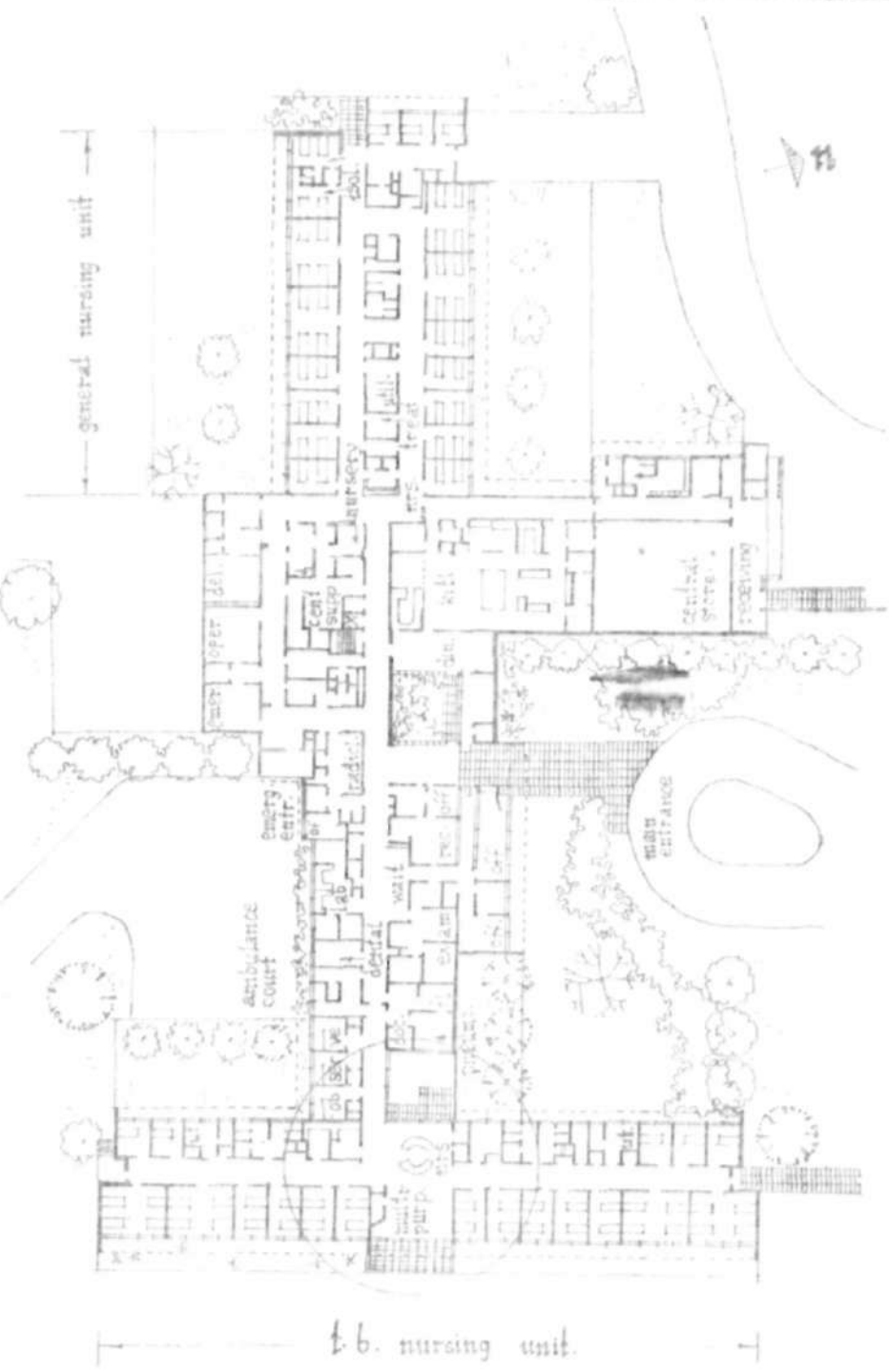
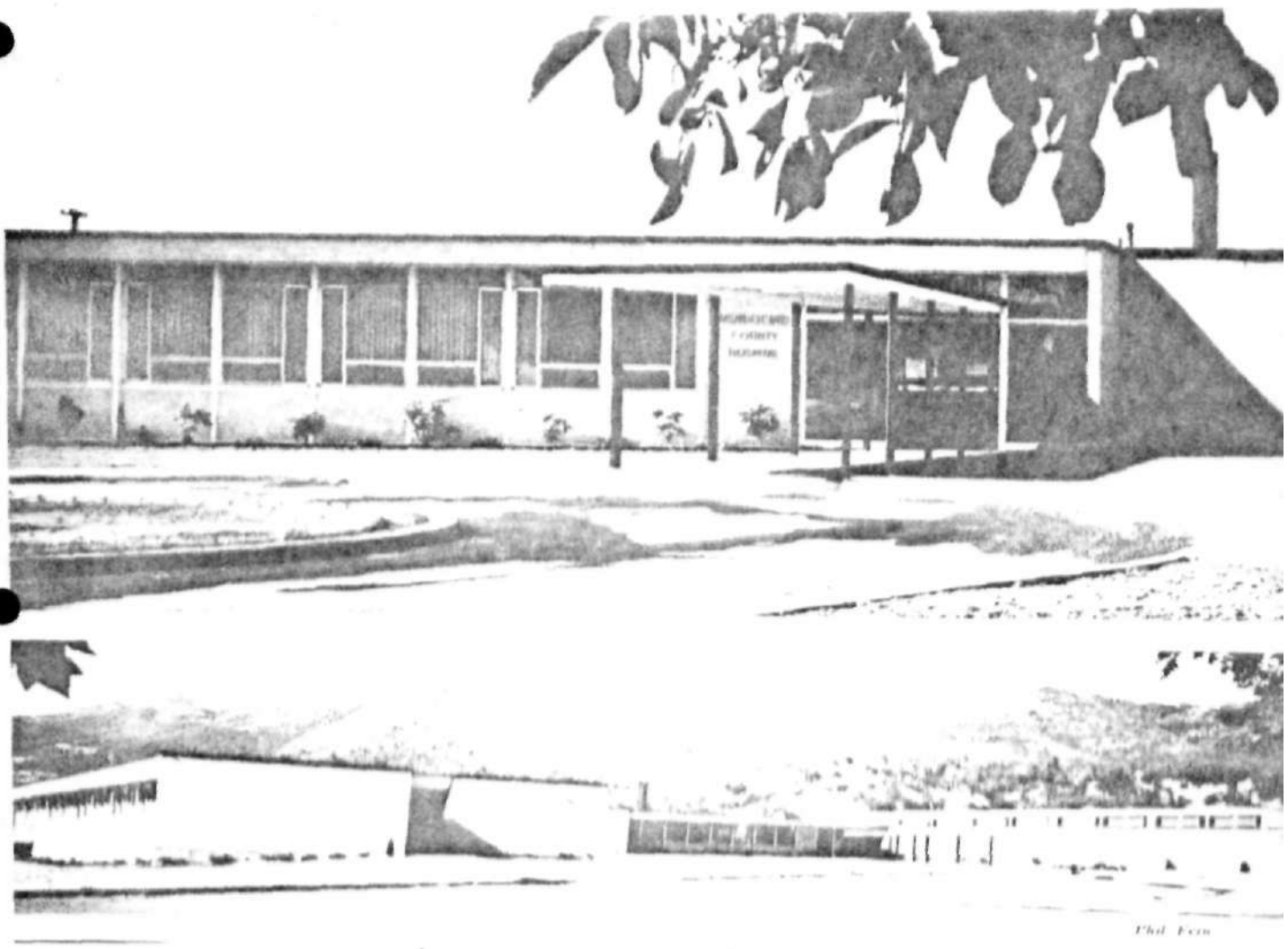


fig. 3.7



mendocino county hospital.

plate I

The Out-Patient department has complete clinic facilities zoned away from other hospital activities, yet located with respect to the laboratories and the radiographic suite.

The unique planning of this hospital makes it quite special in some ways.

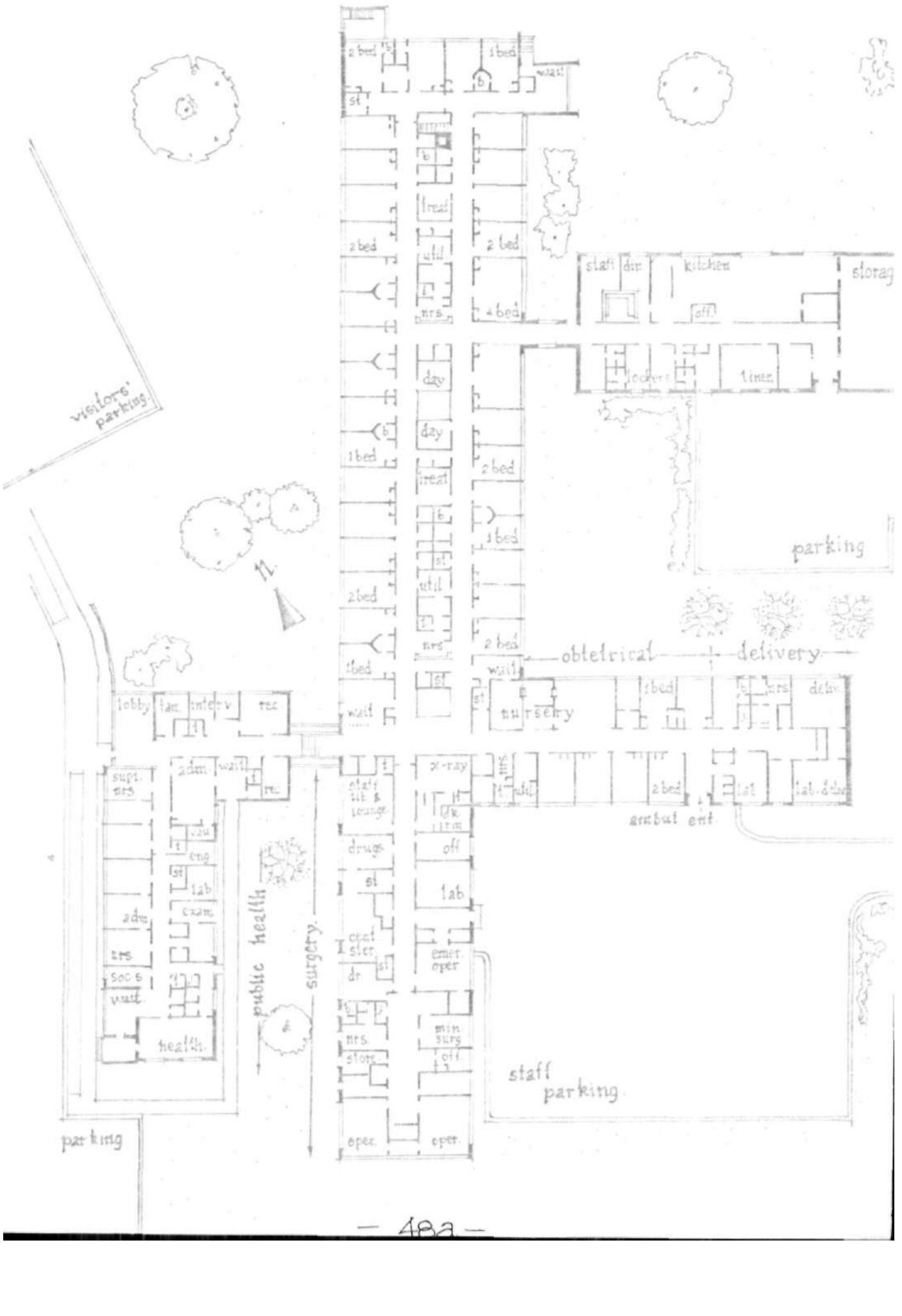
The nurses' centre in the tuberculosis wing is located between the two sections of this wing. Through the use of a central nurses' station, visual control of both sections from one location has been made possible. In addition, since at some later time when the expected decline in TB patients occurs, the function of one of the sections may be changed to some other nedesary purpose.

3.7. FORRESTMEMORIAL HOSPITAL, FORREST CITY, ARK. : ERHART, EICHENBAUM, BAUCH AND BLASS, ARCHITECTS

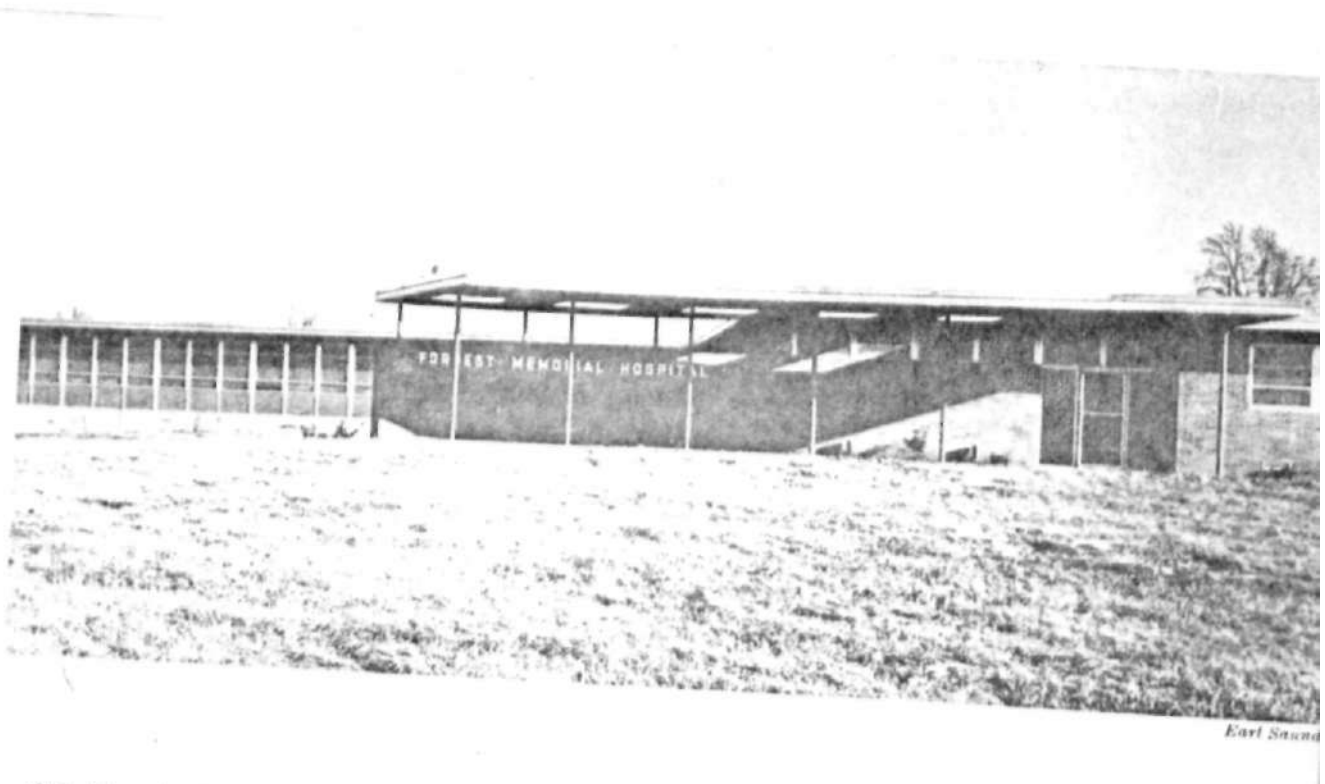
This is the most interesting case study, as it reflects the same concept as the author's; a single medicare building that provides both preventive and curative medical services in a rural area and at the same time designed for expansion.

This 65-bed general facility hospital is expandable to 100-bed capacity and combined with a public health centre serving the county.

forrest memorial hospital, forrest city, ark



forrest memorial hospital.



Earl Sauna

65-Bed General Hospital and County Health Center

COST TABULATION

plate: II

The hospital is all single storey on a nine acre site. The public health centre has its separate entrance and in fact its own wing so that its operations can be isolated from the main hospital building. This also permits the use of the facility, especially its auditorium during evening hours.

The nursing section of the hospital is in effect two nursing units in line. There are two nurses' stations, so placed that either can be closed down during the night hours, or in case the hospital load is unexpectedly light. The nursing unit accommodation is distributed as follows:

- 12 private rooms
- 2 single rooms, for isolation
- 2 four - bed wards
- 17 semi - private rooms.

In the maternity section, there are:

- 2 private rooms,
- 4 semi private rooms
- 12 nursery bassinets and
- premature nursery.

All patients rooms have their own toilet and bath facilities, or share a bath with the adjoining room.

The major adjunct facilities are is separate wings. The operation suite has a cul-de-sac location at the end of one wing, the obsterical suite also has a

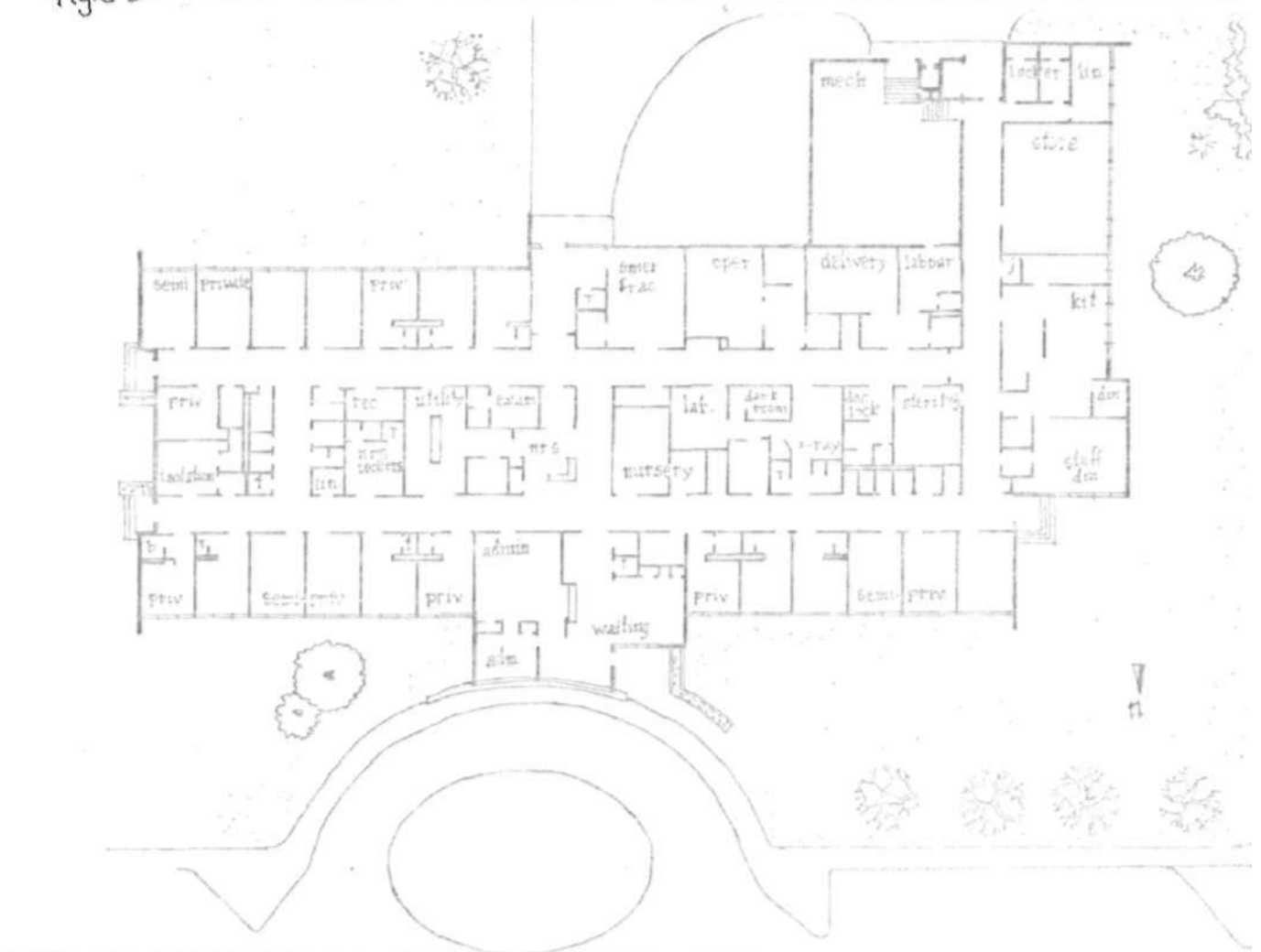
a similar placing in another wing. Kitchen and services are together in another separate wing, placed at the central point in the long nursing section (see fig. 3.8).

3.8. LITTLE RIVER MEMORIAL HOSPITAL, ASHDOWN, ARKANSAS (U. S. A.)

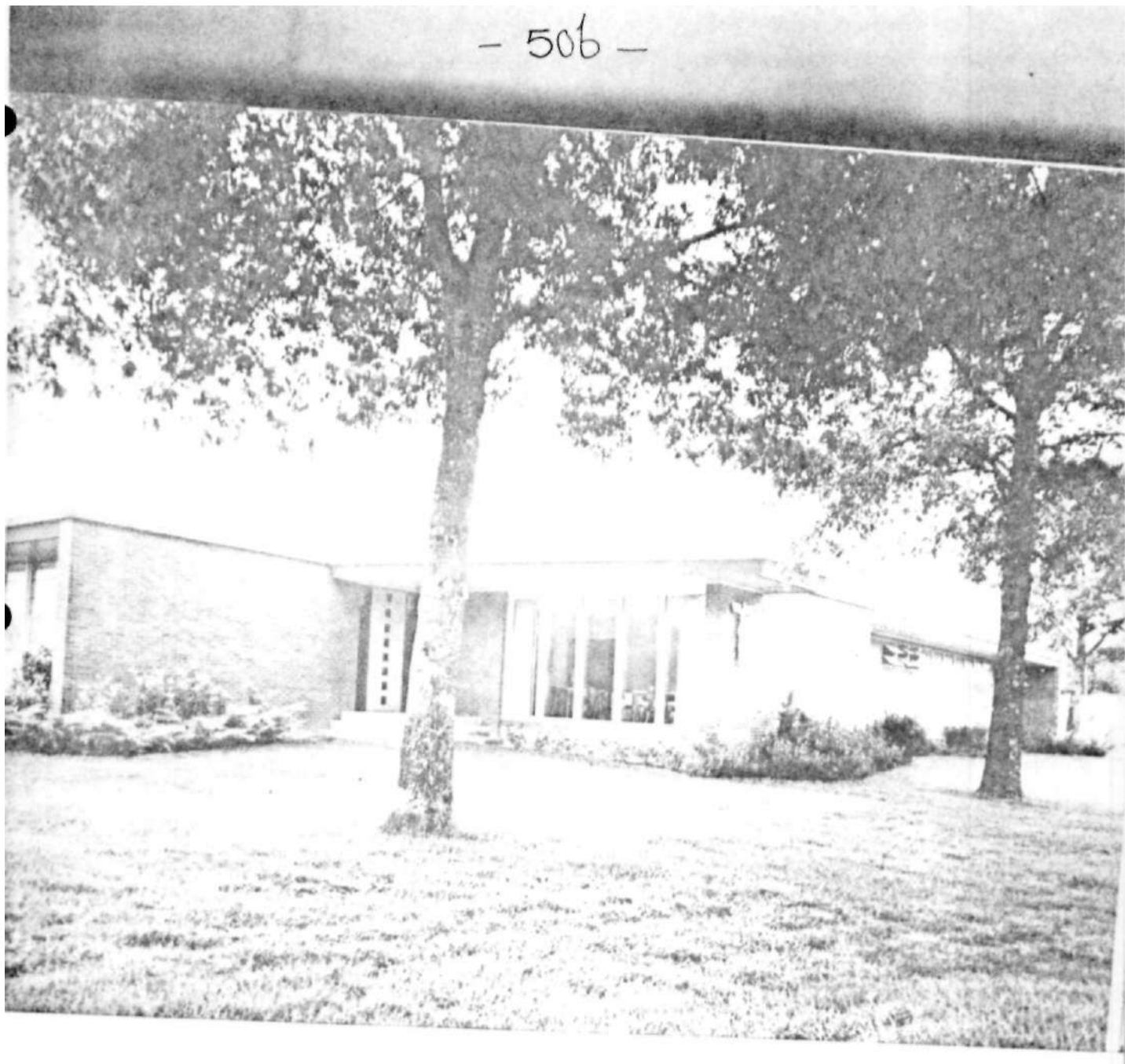
This is an example of a hospital designed with expansion, scarcity of medical personnel and cost in mind. The 30-bed hospital was designed for exapnsion to 50 beds. All afacilities needed for the expanded size have been initially provided . The additional beds may be obtained very easily by extending the patients wings. Though situated in a small community, it provides complete general facilities for the population of the county and surrounding trade area.

The architects spent a great deal of time studying means which would permit efficient operation with a minimum number of personnel and with the lowest possible overhead expenses. These considerations helped a long way in providing a plant of the quality required and at economic first and long-run costs. The resulting structure has been successful in this respect. The functional efficiency of the plan adds greatly to the success of the building. The patients as well as the staff members receive a friendly residential like atmosphere within the hospital.

fig.39= little river Memorial Hospital. Ashdown. arkansas.



nurses' station and reception area.



Little River memorial hospital.

plate 3.

A core type design often used for larger hospitals employed by the architect in the design of this hospital seems especially successful. This allows the hospital to be operated by a minimum number of personnel. Nursing and diagnostic facilities are grouped in the core. Patient room and related facilities are ranged around the outside. The nurse's station is located near the geographical centre of the core. This has reduced to the minimum, the travel required of nurses to care for the patients and perform other duties. The waiting room, emergency entrances and the nursery can be visually controlled from the nurses' station. This is particularly important during the later hours of the night when only two to four people are on duty in the hospital. Entry to the hospital is confined to the emergency doors of the main entrance during the late hours. All other doors are locked from the late outside. This allows one nurse seated at the desk to control all incoming traffic. Also, without leaving the desk, a nurse may attend to paper work, consult patients' charts; consult with doctors in the adjascent room (through a sliding glass pannel), use the telephone (and take incoming calls through the night when the switch-board is closed). The business office is located to allow easy nurses and office personnel to co-operate fully.

C O N C L U S I O N S

1. Due to insufficient qualified medical Personnel, average work load of 60 to 80 patients per consultant per day is too high to cope with. This leads to the improper diagnosis.
2. The limited number of hospital beds cannot adequately cope with the rate of patients requiring admissions which result in the dischagge of patients before they are fully treated and the conversion of the floors and varanders of the nursing units into hospital beds.
3. Many seemingly complicated but simple cases are refered to other hospitals due to lack of diagnostic facilities.
4. The distances coupled with bad quality of roads and inavailability of public transport to the hospitals brings about the ir egular attendances of patients that require regular daily treatments if they come from villages that are far from the hospital. This results into the worsening of the disease and consequent spread and in most cases death of the patient after being rushed to the emergency or even on their way to the hospital.
5. The inadequacy of hospital beds also restricts the admission of patients needing it.
6.

6. The most prevalent diseases reported in all the Nigerian cases in Dutsin-ma and Kankiya Local Government areas are stated below. They are observed to have some consistency with the Nationally identified prevalent diseases in rural areas. They include:

- Malaria
- Measles
- Dysentry
- Nutritional deficiencies
- Gyneacological Infections
- Diseases of the Urinary system
- Pre and Post natal Morbidity
- Gastro-Intestinal Obstructians and Infections

Most of these diseases can be considerably reduced and eventually eliminated through health education, its level of which is currentl, very low.

7. There is the need for the provision of smaller sattelite health centres in the deep rural areas to reduce the rate of disability caused by the prevalent diseases and at the same time reduce the present mortality rate.

8. All health centres designed in future should be designed with expansion in mind and the authority concerned would be good by seeing that the expansion pattern is adhered to.

9. Cases of Neo-natal and post natal deaths are very common in the deep rural areas due to lack of ante-natal services and inadequate health education.

FOOT NOTES

1. F. W. Dodge Corporation (1960),
Hospital, Clinics and Health Centres

2. Health Management Board, Kaduna
Medical Records Division, 1982

Table 4

MOST PREVALENT DISEASES BY PERCENTAGE OF TOTAL CASES TREATED AS AT 31ST DECEMBER 1983

	DISEASES	PERCENTAGE
1.	Malaria	56.471
2.	Measles	10.252
3.	Dysentry	5.792
4.	Nutritional	3.544
5.	Gyneacological Infections	2.810
6.	Diseases of the Urinary System	4.983
7.	Guinea Worm	2.534
8.	Pre and Post Natal Morbidity	2.040
9.	Gastro-Intestinal and Obstructions and Infections	4.203
10.	Diseases of the Breast	2.040

Source: Records Division, Health Management Board, Kaduna.

CHAPTER FOUR

DESIGN PHILOSOPHY: THE PATTERN LANGUAGE

This chapter attempts to present the essential parts of the pattern language in a concise and understandable way. The historical aspects and early philosophies have not been included. This is to enable the author communicates the basic and most important aspects that directly realates to design methodology.

However the book given at the end of this chapter in the foot notes give a more complete understanding of this subject.

It has to be pointed out here that author is greatly indebted to Christopher's book, 'A PATTERN LANGUAGE WHICH GENERATES MULTI-SERVICE CENTRE. This book is a shortened version of the pattern language. Only the major aspects of this subject were pinpointed thereby shelving most of the non essential details.

The later part of this chapter shows how a collection of patterns from which a prototypical comprehensiv. Health Centre is capable of expanding to a General Hospital were formulated by the author. Note also that the comprehensive Health Centre can start from as small a unit as a Dispensary. The patterns were directly derived from Alexander Christoper original ideas and in fact may be taken as an adaptation of it but applied to hospital design in this case.

This is in line with the encouragement towards practicalising the pattern language, until perfection in its use is attained. This perfection is at the moment so badly sought. The pattern language was initially formulated for use in the design of Multi-Service Centres (M.S.C.). The initial language is here presented .

The report deals chiefly with the spatial organisation; but since human and spacial organisation cannot be seperated, many of the specifications given go deeply into questions of human organization as well. Christopher emphasised that the pattern language is not a conventional prototype design. This necessitates first and foremost the definition of the nature and purpose of conventional protype buildings.

A prototype building is a generic scheme, it has no special site, no real client, no climate, no particular size. It is a kind of imaginary building which is expected to convey certain essential ideas to the designers of buildings of this type. It is normally presented by means of loosely schematic drawing, so designers of similar buildings can mould it to fit desired specific local conditions. A prototype design usually defines a family of buildings in such away that anyone who understands it could design specific members of this family[1]

The ultimate purpose is to provide guidelines which will generate a large number of specific buildings under close scrutiny, the idea of prototype hardly stands up very well. This is due to the fact that the range of variation which will be required by different members of any family of buildings lies outside the range which can be accurately conveyed by any single drawing - no matter how "prototypical" it is.

The approach to prototypes is intended to overcome the difficulties enumerated above.

> "We have tried to reconcile the uniqueness of each community with the fact that certain organisational principles are valid from one to another"c2

What they devised is a system of generating principles which can be richly transformed according to local circumstances but which never fail to convey their essentials. This can be seen as a grammer. Grammer in any spoken language is a set of principles which generate all the possible sentences of that language. So choosing prototypical sentences of the language in question will definately not convey its full richness.

The system, is then more in the spirit of grammer than the conventional prototype permits.

4.1. Understanding the Patterns

Some questions that are bound to arise from an Architect might be:

i) What really is a PATTERN?

ii) What is a LANGUAGE?.

and iii) How do patterns relate directly to everyday work of the Architect?.

The best way (or one of the best ways) of answering these questions would be by the presentation of some selected patterns from Christopher Alexander's " A Collection of Patterns which Generate Multi Service Centres". For the adequate and non distorted understanding of the patterns, they are presented in full.

Before going to the patterns, the attention of the reader is called to a statement by Christopher: However, there is not yet any general agreement about the form which multi service centres should take - either in their human organisation, or in their spatial organisation.

So the reader can scan the patterns and get a general sense of their content. One sentence summarises of 32 out of the 64 pattern that generate Multi service centres are presented below:

1. SMALL TARGET AREAS

The Multi-service centre serve a target area with population of 34,000 + 20%.

2. LOCATION:

Service centres are located within two block of a major intersection.

3. SIZE BASED ON POPULATION:

The total size of an MSC, which services a target area of population N, is SN square feet.

4. COMMUNITY TERRITORY:

The service centre is divided into two zones, services and community territory; Community territory includes spaces for community projects and a public arena.

5. EXPANSION:

The number of services can grow and the size of any one service can grow but the relationship of all services to community does not change.

6. ENTRANCE - LOCATIONS:

The building's main entrance are immediately visible to a person approaching, on foot or by car, from any direction.

7. ARENA THOROUGHFARE:

There is a natural pedestrian short cut through the MSC's community territory.

8 ARENA ENCLOSURE:

The public arena is as open as possible to the world around it, while still maintaining the required Effect Temperature inside.

9. LOCKED AND UNLOCKED ZONES:

The building is zoned according to three different time schedules; with one door closing each zone off from the next; 9am - 5p.m., 9a.m. - 11 p.m. and'always open'

10. ALL SERVICES OFF ARENA

All services open off the public arena their frontages are roughly equal.

11. FREE WAITING:

All services share a common waiting area, which contains a variety of activities; this waiting area is part of the public arena.

12. OVERVIEW OF SERVICES:

All services housed in the MSC are instantly visible to a person entering the centre.

13. WINDOWS OVERLOCKING LIFE:

Windows near places where people spend more than a minute or two, all look out an areass of'life'

14. CORE SERVICE ADJASCENCLES:

Personnel in core services are placed according to frequency of interaction, this will typically lead to formation of three cohesive units; administration, community organisation and programme evaluation.

15. PEDESTRIAN DENSITY IN PUBLIC PLACES:

If the estimated mean number of people in the arena at any given moment is P, the size of the arena is 150 P to 300 P square feet.

16. ENTRANCE SHAPE:

Major entrances are either deeply recessed or they stick out from the face of the building, for visibility.

17. THE INTAKE PROCESS:

The intake procedures are informally handled by field workers, in a lounge stettingm near the major entrance.

18. CEILING HEIGHTS:

Ceiling heigth of all rooms and spaces are established according to the diameters of the 'social bubbles' appropriate for those spaces.

19. SERVICE LAYOUT:

Clients go directly from waiting areas to interview and other services spaces; they do not pass through the secretarial poools that back up the interview staff.

20. CHILD CARE POSITION:

The child care station is visible along the path from the entrance to the services.

21. DIRECTOR'S OVERVIEW:

The MSC director's office is situated so as to have an inconspicuous overview of the public life of the centre.

22. ARENA DIAMETER:

To enhance social cohesion the maximum diameter of the arena is 70 - 80 feet.

23. OFFICE FLEXIBILITY:

Office space in the service area is a continuous sheet of interconnecting rooms; the rooms are between 8' x 10' and 16' x 20'

24. SLEEPING OK:

There is a section of the arena set aside, where people can rest and eventually doze off; if the demand exists this section may be left open all night.

25. WAITING DIVERSIONS:

A number of activities like TV, Checkers, Pool, are part of the arena life, and they are woven through the waiting areas.

26. INTERVIEW BOOTHS:

Each interviewer has a private booth, much like the ones found in certain restaurants. the interviewer meets his clients in this booth on a less formal basis than the typical office permits.

27 WINDOW SIGNS:

Provision is made for posting signs and leaflets along the windows that front on the street, so that people who stop to read them can look in, beyond the sign, and get a glimpse of MSC life.

28. ACCESSIBLE WCs/CLOAKROOMS:

There is at least one set of cloakroom off the arena and accessible to the public.

29. CHILD CARE CONTENTS:

The M.S.C. Child care station emphasizes those kinds of play experiences that are most missing from the surrounding community, e.g. plants, sand and water, climbing caves'.

30. SQUARE SEMINAR ROOMS:

This is the best for seminars, where full and mutual participation - is desired.

31. ARENA STORAGE:

There are storage spaces off the arena, where arena furniture and equipments can be locked away, the storage area is 7% of the arena size.

32. WINDOW HEIGHTS IN MEETING ROOMS:

Are 40 inches or higher; this means that people's faces are never silhouetted against windows.

To avoid misconception of the patterns, two minor peculiarities are to be noted:

First: Some patterns have a wider context than a 'Multi Service Centre'. This may seem confusing if it is not understood that the 32 patterns presented here are part of the 64 patterns for multip service centres. But these patterns should not be taken as applicable only to Multi service Centres.

Second: The patterns presented are open to criticisms that will allow them improve.

4.2. The Idea of A Pattern:

The patterns are presented as having two parts:

(i) THE PATTERN STATEMENT

(ii) A PROBLEM STATEMENT

THE PATTERN STATEMENT is broken into two parts: an 'IF' part and a 'THEN' part. The statement of each pattern thus reads:

IF: x THEN Z / PROBLEM y.

- x defines a set of conditions
- y defines some problems which are susceptible to occur under conditions x.
- Z defines some abstract spatial relation which needs to be presented under the conditions x, in order to solve problem y.

The statements of the patterns may be wrong but can be improved . There are two ways in which the pattern statement might be wrong:

1. The problem may not occur a stated under the conditions X, or may occur under certain circumstances, which are far less general than those defined by x.
2. The relationships defined by z may not be the true solution to the problem Y.

In Christopher's own words:

> "We expect the patterns to grow and change under impact of such critism. In this sense the prototype which we defined is merely temporary; if we are successful, we hope that it will evolve, as criticisms and improvements accumulate, so that the patterns which define MULTI SERVICE CENTRES ten years from now, will look very different from the ones which are stated here"
>
> The format of the patterns is designed to make criticism easy".

The possibility of criticism is further increased by supporting all the tendencies, needs and difficulties in the problem statement by empirical evidences.

4.3 The Language

Having discussed the pattern in itself, the native of the pattern languages is now described. The presentation is in such a way that anybody who wants to, can become a 'speaker' of the language that is he can use it to design Multi - Service Centres or any type of building in his own way depending on the

circumstances in which he finds himself.

The language gives the reader designer three specific kinds of help:

(i) it gives him the opportunity to use the patterns in a way which pays full respect to the unique features of each special building. These features include; the peculiarities of the community, its special needs, the particular administrative organisation of the building the designer is designing, local peculiarities of the location, site, climate, etc.

(ii) It tells him which pattern to consider first and which to consider later. Obviously there would be the tendency towards considering the biggest ones, the ones which have the most profound influence on the building before the details

(iii) It tells which patterns 'go together' - that is which patterns refer to similar parts of the building, so that he knows which ones to think about at the same time, and which ones seperately.

As the language and the cascade are two different things, each is described below:

(i) The language contains far more structure that is captured in the cascade. While the language is a three dimensional system of visualizing the patterns, the cascade is merely a two dimensional representation of the language. Attention is confined to those features of the language which are captured by the cascade, so as not to loose sight of its objective which is to present the basic and most important aspects that directly relates to design methodology.

(ii) Although the cascade is a partial representation of the language, it is not intended that a person use this cascade as a flow chart during the actual design process.

The manner in which the cascade is represented is as follows:

An arrow drawn between two patterns, like this:



means that the cloud of pattern B fall within the cloud of pattern A, and:



means that the cloud for pattern C falls inside the union of to clouds A and B.

4.4 A set of Patterns that Generate Expanding Medicare Centres

The
A one sentence summaries of the patterns that were devised after due analysis are described below.

The devised patterns are immitation of Alexander Christopher's idea of patterns. The thesis of FADAHUNSI A.T. (1982), MODEL FOR A COMMUNITY VOCATIONAL SCHOOL, IGBAJO, OYO STATE[3], Immensely helped in understanding the application of the pattern language to generate a building with slightly different functions as the Multi-service centre. So the patterns presented below could be even seen as an immitation of an immitation.

Each pattern describes some features of expanding Medicare centres.

- it describes a relationship required to solve a problem which occur in the Medicare centre.
- it does not describe this problem, it only describes the patterns.

However , it has to be pointed out here that not all the patterns stated have to be used in generating expanding medicare Building, some may be too elaborate and some less elaborate or adequate. In some instances, the features stated by a pattern could have variable magnitude and importance, depending on

size, location and other conditions of the Expanding Medicare Centre to be designed.

4.5 Summaries of the New Patterns

1. SMALL TARGET AREAS:

The Medicare provision will initially serve target areas with three categories of population ranging from 10,000 to 80,000, and different population densities.

2. HOSPITAL TERRITORY

The Medicare centre is divided into five zones; The Preventive zone, Out Patients Zone; Nursing zone; Emergency zone and Services zone, the first four zones are zones that patients' participation is important; while the fifth zone predominantly involves the medical and para medical staff,

3. SIZE BASED ON POPULATION

The size of a Medicare Centre is indicated by the number of beds which is calculated using the formula:

$$B = R_{b/p} \times P_s$$

Where

B - the number of beds

$R_{b/p}$ - the Bed per 1000 of head of population

P_s - Population of catchmen area.

4. LOCATION:

Medicare centres should be located at the population and geographic centres of the catchment areas

5. GROWTH AND EXTENSION:

Design of Expanding Medicare Centres is such that the smallest centre (The dispensary) can expand as a whole to the size of a hospital; also individual departments can expand logically.

6. PLANNING:

Planning concept seperates all departments, yet keep them together and separate all types of traffic yet save step for every body.

7. ENTRANCE LOCATIONS:

Main Entrances of the Centres are immediately visible to a person approaching, on foot or by car from any direction, with more emphasis laid on patients' entrances.

8. PARKING:

Parking provided for everybody initially or there may be patients; staff and emergency parkings separately.

9. GENERAL WAITING:

The general waiting forms the focal point of the users (patients); is divided into male and female sections and be as opened as possible to the buildings around it, while still maintaining the required Effective Temperature inside.

10. OUT PATIENTS DEPARTMENT (O.P.D.)

Patients' flow is made as smooth as possible by clearly defined and simple routes; so that they can find their way to various offices which they must attend within the shortest possible time.

11. CENTRAL RECORDS:

Central records are centrally located between the male and female general waiting - and as close as possible to the main patients' entrance.

12. ADMINISTRATIVE BLOCK:

Offices for administrative works of the Medicare Centres are seperated from the patients areas and close to staff parking where applicable.

13. PREVENTIVE SECTION:

The Preventive section completes the provision for all health work of service to the community; is seperated from the O.P.D. but close to it and to have seperate entrance so patients can approach directly.

14. EMERGENCY SERVICES UNIT:

Patients coming after working hours and those requiring immediate care before deciding the part of the medicare centre to receive them are provided service here: Directly accessible from main gate and left open for 24 hours per day.

15. ROOM FLEXIBILITY:

All spaces could take one or more functions other than that for which they have been originally designed to accommodate; makes expansion easier as room functions are inter changeable and transferable.

16. DIAGNOSTIC SERVICES:

Diagnostic services that assist in the determination and confirmation of the Physician's diagnosis is positioned in the inner part of the Medicare centre, adjascent to O.P.D; easily accessible by in-patients and susceptible to positive control.

17. TREATMENT UNIT:

Centrally located in the C.F.D. to minimise problems of transporting patients; with sufficient waiting areas

18. CONSULTING ROOM:

Each Physician has a consulting room; the physician makes his diagnosis on the patient in this room preferable on a less formal basis than typical office permits; big enough to accommodate all necessary equipment; and sited away from noise of the car park with door opening into the rooms.

19. CONSULTING CAPACITY:

If N is the number of patients a doctor/nurse can conviniently see per day and the average patients' attendance daily is P, then the number of consulting rooms C, is p/N.

20. RADIOLOGY DEPARTMENT:

There is a Radiology department placed close to O.P.D. but accessible to in-patients with space for ambulant patients to sit and bed, trolley or wheel-chair for patients to wait before or after their X - ray.

21. LABORATORY:

The laboratory for both out and in-patients conducts biological mieroscopic study of tissues and fluids of the body; allows sufficient day light but not direct glare.

22. PHARMARCY:

There is a pharmarcy that supplies all medications to various medicare building departments (or units). Size depends on type of hospital in which it functions and should be as close as possible to O.P.D. and have special storage

23. DRESSING ROOM:

Dressing room is provided with two tier tables for patients needing dressing on different parts of the body; The part of the body requiring dressing decides the bench a patient uses.

24. SUB - WAITING AREA:

All rooms serving many patients in turns should have sub-waiting areas, which are opened to a variety of activities.

25. PATIENTS' FLOW:

The entire circulation corridors are wide enough to accommodate 3 people to ensure smooth movements.

26. OPERATING THEATRE:

Close to the X-ray, laboratories and central sterilize supply Department (C.S.S.D.) is a complex workshop (sort of). Where operation on patients are carried out; the operation theatre has four basic zones:

1. OUTER ZONE:

Administrative elements and basic control are in this zone. Personnel enter, patients are received and held or sent to inner zone. People in this zone have to change before penetrating the inner zone.

2. INTERMEDIATE ZONE:

Predominantly work (as anaesthesia, scrub-up etc) and storage of items used surgery are stationed in this zone. It should be clean and accessible only through the outer (protective) zone.

3. INNER ZONE:

The actual operating rooms are in this zone. Highest level of cleanliness and aseptic conditions should be maintained.

4. PHERIPHERAL ZONE

Facilities for handling wastes, used instruments, drapes, gowns dressings and saniterial equipments is done in this zone.

27. MINOR THEATRE:

The minor or 'septic' theatre is needed for minor surgical procedures such as saturing of small wounds, opening of obscess and application of plasters; cleanliness, adequate space, good lighting and ventilation are the basic requirements.

28. ANTE NATAL CLINIC:

Ante natal clinic is a separate unit for periodic examination of pregnant women in preparation for confinement; it may be merged with preventive unit depending on size of the Medicare Centre.

29. CENTRAL STERILE SUPPLY DEPARTMENT

There is a Central Sterile supply Department or unit which supplies all Medicare Centre's departments with complete sterile, equipments, pre-packed and ready for immediate use; size is determined by the daily requirements of the Medicare Building and is located close to laundry, Pharmacy and Central stores.

30. GENERAL STORE

Medicare Building's supplies of all kinds are off-loaded directly into this store then dispatched to user departments; it is to be located away from patient and medical staff routes· easily accessible from the outside road and directly linked to all user departments.

31. SANITARY ACCOMMODATION:

Sanitary fittings to be located at convenient positions for various units, but away from sterilizing unit. In rural area the closets may be located away from the units but easily accessible.

32. CATERING SERVICES:

32. CATERING SERVICES:

Appropriate supply of meal for 24 hours each day would be provided to patients and to staff, depending on the size of the medicare centre. Maximum natural light and cross ventilation is to be well provided.

33. NURSING UNITS:

A group of accommodation for patient with service rooms and means of access, that enable a team of nurses to care for in-patients under the best condition. These units are divided according to service type.

(a) Medical Nursing Unit
(b) Maternity Nursing Unit
(c) Paediatrics Nursing Unit
(d) Surgical Nursing Unit
(e) Psychiatric Nursing Unit.

The Centres in the lower chain of the Medicare Building have only the first three. The Nursing Units are to be located away from noisy parts of the Medicare centre - with adequate control of cross - infection; they should have reasonable privacy and climatic control. No one unit is to have more than 32 beds for proper supervision and provision of the basic service facilities.

34. NURSE WORKSHOP

Nurse workshop is the central nursing headquarters for the nursing unit whose functions are

- keeping medical records of all patients in the unit
- handling patients' calls
- controlling visitors' movements

It is to be located to provide safe and clear observability and visual supervision of all visitors and patients.

35. VISITORS:

People shall be free to visit in-patients in their wards at specified times; their entrance into the wards should be in full view of the nurse workroom for proper control.

36. DAY - SPACE:

There is a day room where ambulant patients can go to amuse themselves when they find staying in their rooms tiresome.

37. WINDOW HEIGTHS IN WARDS:

Windows are 100cm or more above floor level so that air entering the room does not have contact with the patient directly and reasonable privacy is achieved.

38. LAUNDRY:

There is a laundry that processes soiled linen for re-use. It is designed to promote smooth work throughout the plant without any conflicts e.g. clean linen have no contact with dirty linens. It should be adequately lighted and ventilated; A sewing room may be provided for amendments of torn linens for immediate return into circulation - depending on size of medicare centre.

39. CIELING HEIGTHS:

Ceiling heigths of all rooms and spaces are established according to the functions that take place within each room.

40. MORTUARY:

The Mortuary is to be kept seperate and if possible have an exit concealed from patients.

41. LOCATION OF COMPONENTS:

Building components as partitians and structural walls should be positioned with their centres on the grid lines.

42. DIMENSION OF SPACES:

All spaces are multiples of some units evolved from the permissible sizes of some important spaces in the Medicare Building design as room as consulting room, nursing space etc.

43. SPACE DIVIDERS:

Easily demountable prefabricated elements are to be used for ease in expansion and conversions of functions of different space to other different functions.

4.6. About The New Patterns

The patterns stated above were essentially obtained through different means. Some are 'hybrids' of existing and accepted standards of respected and recognised authorities as the Nigerian Medical Association, The World Health Organisation (W.H.O.) states and Federal Ministries of Health. However, some of the patterns were obtained from researches on existing hospital within the country and from outside Nigeria. Others are simply stating facts that have been in use for ages by architects and known by most builders.

Here the author cannot boast of introducing a completely new approach to the design of Medical care Buildings that grow from the grass root to hospital Architecture. The collection of patterns stated, is simply a set of rules that have been used before in designing hospitals and modifying them for

use in design of of above nature for both present and future use. The pattern language is just one of the systematic approaches to solving design and planning problems.

This work is an attempt at using the pattern language. The reader should bear in mind that the success of this attempt will be more justifiably assessed if the following facts are considered:

i That these patterns are derived from Christopher Alexander's own idea of patterns, especially those he uses for multi-service centres.

ii Each of the patterns has room for improvements.

iii. The rules of the game have been strictly adhered to as earlier laid down. One of these rules is that the format of the patterns should be designed to make criticisms easy. This is because criticisms are essential so as to allow the patterns to improve as criticisms accummulate. Readers are therefore advised to take this attempt of application in the above spirit.

Though very few of the tendencies, needs, and difficulties discussed below in the problem statement have been suppoted by empirical evidences, most of the facts stated are known to or, have been either widely used or well accepted facts or both. Some facts were obtained from practical experiences of users who have been interviewed.

Many criticisms that are bound to arise are well known to many and need not be enumerated here.

> "One of the most basic of these criticisms is the fact that many designers, especially those in the intuition school of thought regard any idea of a systematic approach to solving planning problems as an inhibition, a facit acknowledgement of lack of imagination, or at least an unnecessary suppression of one's intuitive powers".

Despite these criticisms, there is no doubt about the fact that many architects builders and planners still believe that it is one of the best ways of solving planning and design problems".

... Attoe in Architecture and Critical

Imagination said: "...

> The advantage of typical design id that it can be efficient and dependable. We need not re-invent the wheel every time we design. And we need not the wheel every time we design. And we need not take a chance on a new vision either...

He also spoke directly on the patterns language:

> "Investigations in pattern language assume that there is some consistency in overt of behaviours of people in the same culture, class or situation. Just so as there are some set ways of doing things. An example is the almost universal system of connections between entry, receptionist, and waiting area in offices, It seems that this type of solution ... turns up again and again, but each time with slightly different variations" 4

Concluding he said:

> "The idea of pattern is an attempt to combine a high level of functional analysis with the advantage of the typological approach. Pattern language takes a typal approach to observing and describing behaviour. In the future we can expect to see efforts to self - consciously reconcile typical perceptual and behavioural patterns and the typical task of construction and maintaining specific types of building" 4

Professor Francis Fergueson, in his book Architecture, Cities and Systems of Approach, had the opinion that even though modern movements aid transition in architectural form and style originated at the turn of the century, it is only now that there has been revolution in analysing the thought processes encompassed by planning and design.

He further opined that this revolution in thought has generated a number of "approaches" to planning and design problem solving, an approach being simply the conceptual framework within which one can engage a particular set of phenomenan. Presumably some approaches are better than others in the sense that they are more efficient or effective in the solution of a specific problem. He concludes:

> "The demand for an approach is then a recognition that ours is a world far removed from that of Soarinen's Medieval master builder: we now need to be self-conscious about how we proceed to solve problems of planning and design"5.

4.7 Application of Patterns that Generate Expanding Medicare Centres

The patterns taken up in this section are some of the ones used by the author in evolving the first three stages of Medicare service ladd. The magnitudes of many units and standards range from nothing to any size depending on the scope of service of the Medicare Centre to be designed. The manner of presentation is the same as that stated in the second part of this chapter. (4.2 The idea of a Pattern).

4.7.1 SMALL TARGET AREAS (1)

P A T T E R N

IF:

A rural area is to be served by any Medicare Centre

THEN:

The provision will depend on the type of settlement in the area and the most prevalent disease in the area.

It should reach all types of populations in the rural areas. This is best done by dividing the Medicare Centres around the rural areas in such a way that no patient travels for more than 20 Kilometres to reach a Medicare centre. They serve on referal system.

The provision is to be in stages of Medicare provision chain as follows in the ascending order:

i) dispensaries,
ii) Health sub Centres,
iii) Comprehensive Health Centres,
iv) Rural Hospitals,
v) District Hospitals,
vi) General Hospitals,
vii) Specialist Hospitals.

medicare services ladder.

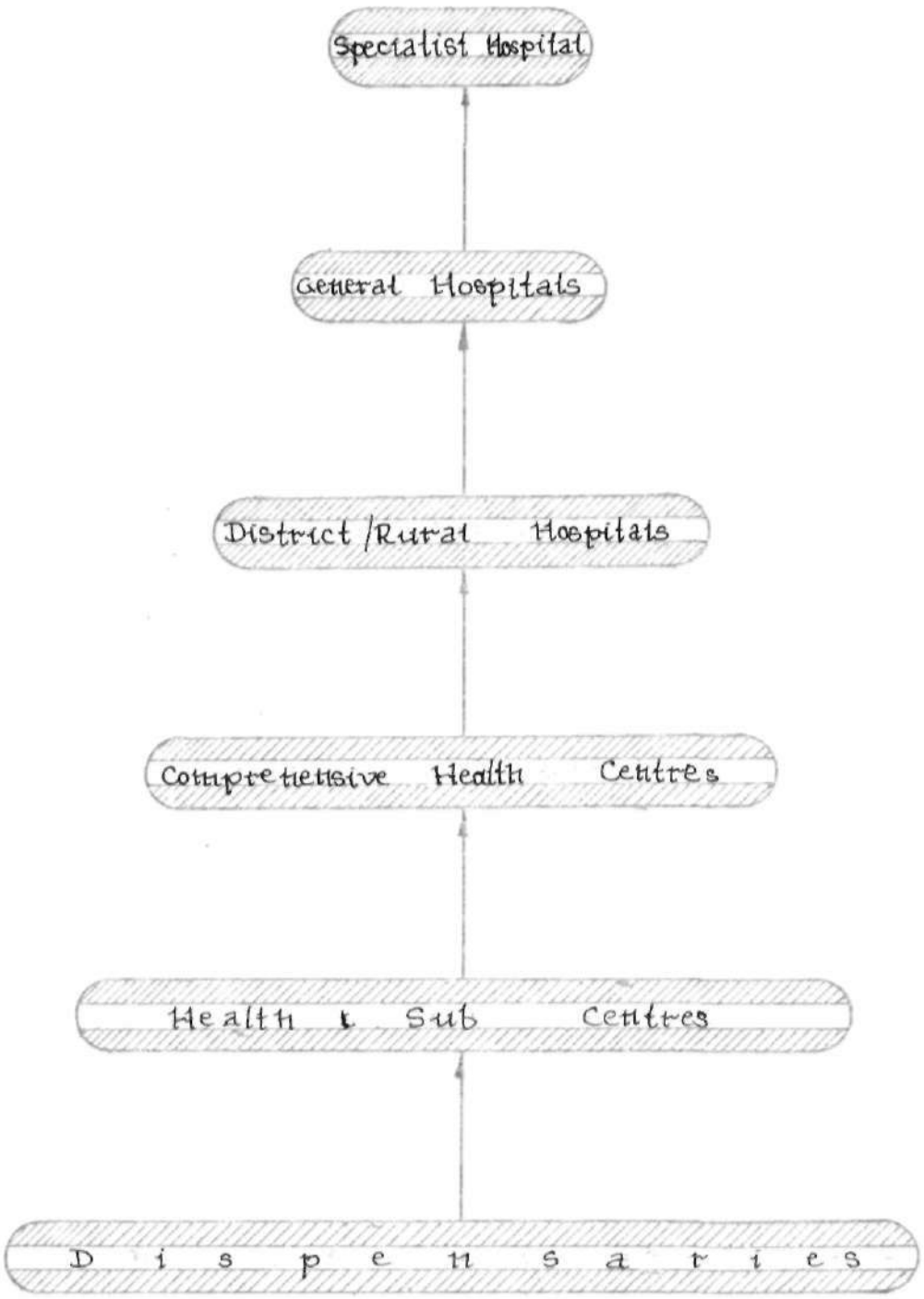
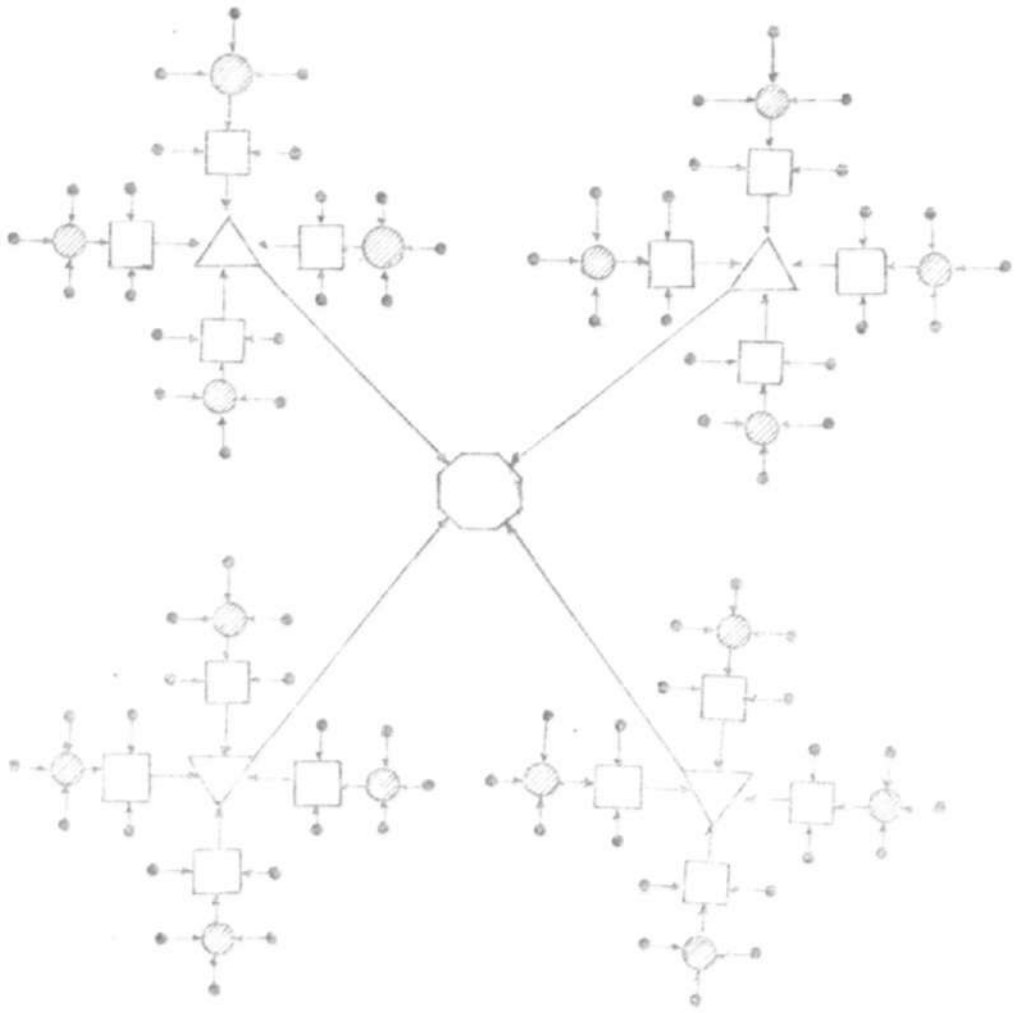


fig. 4·1

functional organisation of medicare centres



- Dispensary.
- Health Sub-Centre.
- Comprehensive Health Centre.
- District / Rural Hospital.
- General Hospital.

fig. 4.2

i. DISPENSARIES:

Dispensaries attending up to 100 patients daily, serving a population of 10,000 persons in sparcely settled areas. The health personnels stay in the place and provide the needed medical assistance at that level (100 persons/ Km^2 and annual attendance of 40,000).

ii. HEALTH SUB CENTRES:

The Health sub-centres attending up to 210 patients daily, serving a population of 25,000 to 30,000 population in medium and densly populated areas.

They will perform additional functions to those of the dispensaries such as public health, dental health, referal services, nursing care for a small number of people. They also supervise the dispensaries in their areas of referal enclosure (surroundings) (75,000 annual attendance).

iii. COMPREHENSIVE HEALTH CENTRES (C.H.C.):

This would perform the functions of the Health sub-centres with higher degree of sophistication and would be responsible for supervising a number of satellite Health sub-centres and dispensaries. The functions include, general medicine, general surgery, maternity commucable diseases, and classifying of patients

- B R E T T A -

Page 100 is the Continuation of Page 89

The Mistake is Deeply Regretted.

suffering from tuberculosis, or social or endemic diseases for transfer to appropriate specialist or general hospitals. These centres provide nursing for 50 - 100 patients i.e. 50 - 100 beds. They serve a population of 60,000 to 80,000 population in densely populated areas.

Cases that are beyond the scope of the CHC are referred to the Rural or District Hospitals and others higher in the ladder. (Population density of 250P/Km^2 and 125,000 annual attendance)[9].

iv. RURAL HOSPITALS:

This is slightly larger than the comprehensive Health centre in size and scope. It is however smaller than the District hospital. It receives refered cases from the comprehensive health centres. These hospitals provide in addition to the comprehensive health centres, paediatric and psychiatric Nursings. Each of these departments would have one or more wards with 10 to 20 beds. The total number of beds provided ranges from 100 to 200 beds - serving a population of 80,000 to 150,000 persons in densely and medium population areas. The rural hospital also supervises the comprehensive health centres and dispensaries around it.

v. DISTRICT HOSPITALS.

District hospitals serve population of 150,000 to 200,000 persons in densely and medium populated areas. There exist departments of common specialties as paediatrics , gynaecology etc. but refer more complicated cases to higher Hospitals in the chain. They accommodate 200 - 300 beds.

vi. GENERAL HOSPITALS:

The general hospital provides some specialist medical care of common diseases in their areas of jurisdiction. They also provide teaching facilities but only for nurses and medical - auxiliary staff. Cases are refered from the hospitals and centres in the lower part of the ladder. They also monitor the activities of the district and rural hospital. The General Hospitals serve populations ranging from 200,000 up to 500,000 persons in all types of populations.

vii. SPECIALIST HOSPITALS:

Specialist hospitals are characterized by the presence of most complex specialized departments where patients suffering from the rarest diseases can be admitted and treated. They also serve as teaching Hospitals where stu ents physicians learn the actual

practice of their art, working under highly qualified clinicians, observing and studying under the intructions and supervisions of highly qualified specialists[6].

The types of specialities include, cancer, urology, special operations, as corneal grafting ophthalmology, fenestration of the examinations in cardiology and so on.

They also coordinate with all branches of medicine as large psychiatrics hospitals, tuberculosis, paediatrics centres etc.

The specialist hospitals cater for populations starting from 1.5 million persons. They are cited in the urban areas only.

PROBLEM:

The task of determining the best size and mode of distribution of Medicare centres is not an easy one. This is because there are strong reasons for large as well as small Medicare centres. Some of the reasons are:

(a) The need for Medicare centres; patients do not want to be referr d from a centre close to their homes to another further away from home.

This is most undesirable in sparcely populated areas where road conditions are very bad.

(b) The need fo reach the poor peasant:
Although the Medicare centres could reach certain part of the poor community, they need a lot of enlightenment to convince the poor peasant that his journey to the Medicare centre would be benefitting.

(c) Inavailability of Medical staff:
The scarcity of Medical personnel may minimise the number of Medicare centres. This may result into the provision of big Medicare centres in urban areas that the poor peasant hardly have access to, or the provision of very small ones so spercely located that the peasant patient finds it very difficult to attend . In this situation the peasant honours any referal of his or her case to another bigger and very far only if he or she has to. Where it is necessary, it might even be too late for the physicians to save his or her life.

This problem is being reduced by the recommendation of Nigerian Medical Association that nurses be trained to carry out basic diagnosis on the patients in hospital, they refer complicated cases to the physicians.

(d) In a referal system comprehensive record may not be very easy to keep. A peasant refered from one centre to the other hardly goes back to the previous centre to report his progress. This could be reduced by giving the patient a single card which could be presented all at all centres refered to, thereby keeping a comprehensive history of any case. The Medicare centres can also co-ordinate their records in a similar way.

4.7.2 LOCATION (4):

PATTERN:

IF:

A Medicare centre is to be located at the geographical and population centre of the catchment area.

THEN:

The site should satisfy most if not all the conditions for siting a Medicare centre. In addition to this, the centre should be situated where the staff would agree to go with minimum inconviniences and cost.

P R O B L E M:

A site considered best for locating the Medicare centre for infrastructural and population reasons may not be at the geographic centre of the catchment area. This reduces the effective utilization of the Medicare centre.

So the correct location of Medicare centre could help in two ways:

i) If prominently placed, it will remind the people of its existence;

ii) If conviniently located, it will help encourage people who have already heard of it but who are still half hearted about changing from traditional medicine to use it.

4.7.3 OUT - PATIENTS DEPARTMENT (O. P. D.))10)

PATTERN:

IF:

There is a department or unit where all patients arriving at the Medicare centre report first.

THEN:

1. It should have direct access from the main entrance and close to the centre's entrance so that patients comming on foot are not over strained.

2. It should be designed for multiple uses.
3. Location is where ample future expansion would be feasible.
4. The department is to provide medical care to patients not registered as in-patients. Those admitted as in - patients are transfered to the nursing units.
5. Smooth patients flow has to be ensured to avoid confusion, disorder, time wasting and bad tempers. This is done by simplifying all patients' routes.
6. The department should be flexible to allow the doctors organise their work in any way that suits them and allow for interchangeability of rooms without any or major alterations of the structure. This means that rooms must not be designed to suit just a single specialty or function.
7. The O.P.D. consists of three main elements:

   i). Waiting and Reception

   ii) Consulting rooms;

   iii) Diagnostic and treatment (clinics).

8. The Clinics are divided into 3 main groups, Medical, surgical and special. The services offered by each of these groups is as below:

MEDICAL

- general medicine
- psychiatryc
- dermatology
- Cardiology
- Pulmonary disorders

SURGICAL

- general surgery
- special surgery
- rectal surgery
- genito - urinary
- orthopaedics
- Gynaecolological

SPECIAL

- Ophthalmic
- E.N.T.
- Dental

PROBLEM:

When a building receives peop' arriving at the centre, the following conflicts are bound to arise:

(i) Both males and female will not welcome staying under the same roof for a long time due to religious and socio-cultural reasons. However approach road can be on the same route as it is for a very short time and the attention of each patient will then

be on the entrance into the O.P.D.

((ii) The visits of the females to the centre will be restricted by their husbands which will lead to under utilization of the Medicare centre.

(iii) If the entrance is close to the main entrance, noise from the main road could disturb the proceedings in the whole centre. The entrance to the O.P.D. and hence the whole centre needs to be recessed inside the site to cut out noise from the road.

In order to ensure maximum utilizationl

(a) the males should be seperated from the females;

(b) The routes to different consulting rooms should be opened and if possible visible or even within the general waiting area depending on size of the centre.

(c) The apace must have at least two openings so that through passage is easy.

4.7.4 PREVENTIVE SECTION (13)

PATTERN:

IF:

Preventive services are to be housed within a Medicare centre.

THEN:

The concern of such a section would be to bring down the occurance and re occurence of diseases through public health techniques.

The following Preventive measures are to be taken in the unit:

- Health education of the public
- Control of Communicable diseases
- Environmental sanitation
- Public Health Nursing
- Keeping of statistical records
- Housing control
- Routine examination of Ante natal and child welfare
- School Medical examinations.

In small Medicare centres serving relatively small and sparcely populated area, the low attendance - rate may warrant the use of the same part of the centre for several different purposes, e.g. the room used in the morning to give medical care (as waiting area) can be used for public health purposes at later part of the day, when the peasants are back from their farms.

Where this unit is within a bigger Medicare Centres , as the comprehensive Health Centre, Distract hospital etc serving large and densely populated areas, it may be completely seperated from the curative section (which is the main body) of the centre. The link between them being not only the technical and top

administrative services but also from architectural point of view.

PROBLEM:

When a Medicare centre or any building have two seperate wings receiving people just arriving (some for the first time), these is bound to be the problems of:

(a) confusion people needing one type of attention may spend their whole day waiting at a place just to be informed later that they are in the wrong unit.

(b) People would attend preventive unit (especially those in the deeper rural areas) only if they stand the chance of receiving some benefits physically as they do in the curative unit.

The first problem may be alleviated by providing a general waiting where some form of sorting takes place. As for the second one the people would be encouraged to attend preventive - medicine services units by: arranging film - shows not only on health education but sometimes on general conduct: issuing packed food items (as milk) to the patient in say malnuitrition centre. giving out graphical representation about basic health education on small posters and any other arrangement

that the preventive Medicine personnel may deem fit through study of the area the unit is serving.

4.7.5 EMERGENCY UNIT (14)

PATTERN:

IF:

There is a life - saving service unit that receives patient under critical health conditions and those going after closure of C.P.D.

THEN:

Its entrance is directly accessible from main gate, seperate, prominently located and opened for 24 hours each day.

The unit should have a fully equiped resuscitation room (or rooms) and close to the diagnostic unit. The type of equipments in the resuscitation room depends on the size of the Medicare centre.

> "The gross floor area to be assigned to emergency department will vary from nothing to 15 square feet (1.67m^2) per bed according to programme requirements"7

Normally receiving areas must be implemented for normal days and some extra one for the peak load periods in large medicare centres.

The emergency unit should be functionally and organisationally close or even part of the O.P.D. as the case may be.

The sick patient is to be transfered as little as possible, and examined and treated with as much privacy as possible. Children should be as much as possible shaded from witnessing other casualities just arriving at the centre[6].

Accommodation to be as flexible as possible so that maximum use can be made of the few facilities provided.

The functions of the emergency unit can be divided into five:

(a) Reception of accidents patients both ambulalatory and non ambulatory and other emergencies as medical or surgical; poisoning, foreign bodies in eyes, acute seposis etc.

(b) Returning cases for dressings

(c) Cases returning for other treatments as injection of antibiotics:

(d) Other casual Patients that may be refered to other centres, bodies taken to mortuary

(e) Housing for patients that require further observation after treatment.

PROBLEM:

The problem of the place being over crowded can not be erased, and some patients with less serious cases come every day, some due to the fa t that they would not have to wait for a long time before being treated. In cases of accidents involving a great number of people the emergency unit is also over crowded.

Another period of overcrowding is when an infections diseases occuring in the locality has not been identified yet. This period is not only witnessed by over crowd in the emergency unit but is also very dangerous to the in-pateints and staff of the centre as well.

Shortage of drugs in the unit is experienced whenever it is over crowded. This problem arises most during the weekends when pharmacy is closed through out. This lack of drugs reduces the efficiency of the life saving service of the unit.

4.7.6. CONSULTING CAPACITY (19):

PATTERN:

IF:

There is a Medicare centre whose number of consulting rooms are to be determined.

THEN:

Such determination can be made using the following:

If M = average weekly attendance in any clinic

t = average consulting time in minutes

s = the total length of each session in minutes.

Then the critical number of sessions required weekly (Y) is

$$y = \frac{M + t}{S}$$

If r = number of sessions held weekly, then the critical number of consultation suites required (c)

$$c = \frac{Y}{r}$$

Since C is the critical supply required, it must be exceeded in practice. Modification based on observation and experiences should be made to allow for the changing conditions'[8].

Alternatively, in Medicare Centres that provides only general medicine and preventive medicine services the following formula can be used:

$$C = P/N$$

Where C = Number of consulting rooms needed.

P = Average daily attendance in the centre

N = Number of pateints a medical personnel can convinintly see daily.

PROBLEM:

To establis the values for knowing the number of consultation suites needed in the first case above, the following steps are to be taken.

(1) To compute the average weekly attendance (M), the expected attendance to the whole Medicare centre is first calculated. (This will be based on the assumption that at least 85% of the total population in the area are ready to use the proposed medicare centre, this means taking at least 85% of the expected annual attendance of a medicare centre of that size stated under Pattern 1 (small target areas). This assumption is because majority of the peasants in the rural areas don't attend the medicare centres due to lack of access to them (distance) and lack of enlightenement as shown in chapter one of this thesis.

2. The Average Consulting time is minutes (t) is computed by estimating through observation and experience the average time a medical personnel spends on each patient in the consulting room for each clinic or unit.

3. The total length of each session (s), is computed by converting the hours the medicare centre opens for new and old visiting patients daily into minutes.

4. The number of sessions held per week is either five or six, depending on size of medicare centre.

4.7.7. NURSING UNITS (33):

PATTERN:

IF:

A Medicare Centre is to provide accommodation for patients requiring nursing attention.

THEN:

The following considerations are required:

1. The nursing unit should be designed so that it can be altered in respect of medical specialty, size of nursing unit and degree of nursing care.
2. The size of the nursing unit should be such that it does not exceed the number of beds a nurse can conviniently supervise. This number should not exceed 32.

3). There should be sufficient space to examine and treat patients both in the immediate bed area and in seperate treatment room.

4. The arrangement of units should discourage the outbreak of infectious and its spread. This could be reduced by providing isolation of patients, so facilities for such an arrangement be made available.

5. Nursing staff within the ward are to be in a position that they can supervise the whole unit with easy access to patients and their individual reports and easy to control visitors.

6. Sufficient space in single rooms and behind bed curtains in multiple rooms to attend a patient in privacy.

7. The space at bedside to be sufficient for visitors and the patient to sit up.

8. Day space to be provided for ambulant patients to amuse themselves or meet a group of visitors.

9. No ward should form the passage way into another and where a ward has more than one entrance, the main entrance should be easily identifiable

10. The nursing unit should have easy communication with diagnostic, treatment and services departments.

11. There should be a balance between giving the patients a view of human activity outside the unit and external noise and privacy.

12. Internal noise is to be reduced or eliminated by use of appropriate sound absorbing material and by placing noise emitting activities as much as possible in enclosures.

13. The maternity required should not be directly linked to all facilities not exclusively required for maternity work such as X-ray, pathology etc and should have easy access from a secondary road into the delivery unit.

14 The nursing units for adults should be according to sex, but for children both sexes can be mixed together.

15. The children ward caters for various age groups ranging from babies to 12 years of age. Children under school age are to be admitted with their mothers, so provision should be made for them.

16 A higher nurses to patients ratio than in adult nursing unit is required.

17. Children may be grouped according to age group

18. Play space to be easily accessible to children.

PROBLEM:

1. Patients are generally susceptible to infection. This risk is further increased by the peculiarities of the medicare centre environment. Some patients may even be the source of infection.
2. The changing in standard in the field of medicare makes the design trend of medicare centres unpredictable, hence the need for flexibility and adaptability in design.
3. In as much as noise is disliked, some sources like talking, emptying of bed pan, movement of doors cannot be eliminated.
4. In the children ward, the mothers admitted with their children pose the following problems:
   (a) The obstruct the work of the ward by their presence and by actions and sometimes unreliable behaviour.
   (b) The young patients is more difficult to manage in the presence of his mother
   (c) The nurse loses the chance of experiencing the care of the very young.

5). The control of visitors to a patient is bound to pose a problem especially in rural areas where visitors come in groups. These groups don't know the effect of their disturbances to the patient in contrast they see the visit as a social and moral help to the

patients. This problem is more serious in centres for infectious diseases because the visitors end up being infected after such visits.

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CHAPTER FIVE
SITE CONSIDERATIONS

Some important factors need careful consideration when siting Medicare buildings. These factors include, site location, the microclimatic features and other guidelines for the selection of a site. This is important for the successfull implementation of a condusive medicare buildings.

5.1 Site Selection Guidelines

Selection of a site for Medicare building is to be made with care. The following factors should be considered.

(1) The Relationship of the site to the catchment area. It should be as close as possible to the centre of population of catchment area. (Chapter 4, pattern 1, 4.1)

(2) Size of site related to building needs over a period of time. It should also have reasonable proportions with the length not more than twice the width.

(3) The site confuguration as related to building requirements and integrated use. This includes the topography, soil geology, natural drainage patterns etc[1].

(4) Accessibility to all weather road. The site should be close to at least one road that is motorable all seasons.

(5) Relationship of site to the nearest village. The site should be such that the prevailing winds do not reach the Medicare building after crossing the town or village.

(6) Site restrictions, easements, views, noises and other nuisances are to be considered.

5.2. Site Planning

Planning of a site mainly involves the pattern of arrangement of the central built-up spaces of the Medicare centre, their relationship with one another and with other supporting built-up spaces. All these factors are planned with the open spaces within and around the bult-up spaces. For the purpose of proper planning, the central built-up spaces (units) and the supporting built-up spaces have to be understood.

The central built-up spaces addressed below as Medi-functional units consists of those zones that involve the patients. These are the Out Patients Department, the Preventive, ante-natal, nursing units and the surgical suite.

The supporting or pheripheral built-up spaces consists of those units that ensure the smooth running of the medi-functional units. They are usually run by para-medical and auxilliary staff at the Medicare centre. The units include the laundry, kitchen, Mortuary, Workshops for maintenance, the generator house and the Central supply store.

Having identified the two sectors of the Medicare Centre, we proceed to formulate some factors that have to be considered in the process of site planning.

(1) All the built-up spaces must have a connection with some parts of the medi-functional units.

(2) Functions that are likely to cause pollution of any kind should be positioned on the lee-ward side of the Medi-functional units.

(3) Buildings that receive supplies from outside the Medicare centre should have easy vehicular access.

(4) The Peripheral built-up areas should never be placed in such a way that they restrict future expansion of the medi-functional Built-up areas.

(5) The free outside spaces should be designed in a deliberate way as outside rooms and in such a way that people can use for working, relaxing or even for temporary storage of furniture while adjascent rooms are being cleaned.

(6) The Peripheral built-up areas are arranged such that those needing much water and similar services should be grouped together for easy frequent maintenance.

(7) Preservation of existing follinge and new planting is of utmost functional and psychological benefit. In addition to the shade provided by trees, more planting can have overall cooling effect by absorbing solar radiation during the day.

(8) Buildings should be oriented such that sun is avoided and a full advantage of the breeze is taken. Orientation according to the sun is best, since the course it follows is strictly fixed, whereas air currents are easily deflected by the use of slanting screens or louvres, inserted into window frames.

(9) Staff housing should be sited close to the Medicare - Centre, but not to close in order to provide some off-duty peace and quite.

5.3. Site Location

Although the scheme is essentially combination of rules which generates Medicare centres, it would be incomplete if it is not examplified on an existing site. The chosen site is at Dutsin-ma in Kaduna state. It was chosen not just because it is the headquarter of Dutsin-ma Local Government area, but because it is approximately at the geographic as well as population centre of the area the Comprehensive Health Centre is to serve.

Dutsin-ma is located on latitude 12^{o} - 26'N and longitude 7^{o} - $30^{'}$E. It is located at the northern part of the state and about 114 kilometres from the Nigeria - Niger boarder[2].

5.3.1. The Site

The site is located in the southern part of the town. It is within the site proposed for institutional buildings in the Master Plan of the town proposed by Max - Lock (1978). The site is about three kilometres south west of the town and opposite the Government Secondary School. It is bounded to the west by the Sokoto Rima Basin Development Authority (S.R.B.D.A.) Offices and Staff Housing and it extends to the north up to a seasonal river. The site is not bounded to the east by any parmanent structures, there is only a site for the annual agricultural show. The site is bounded to the south by a major road to Katsina northwards and Funtua southwards. (See proposed structure plan). See map 2.

5.3.2. Site Analysis

Adequate analysis of the site is required for the production of a balanced design. It helps to eliminate any possibility of establishing a preconception of the whole programme.

Site Microclimate:

The site covers an area of over seven hectres. This is adequate for the comprehensive Health Centre with ample space left for the staff housing.

Topography:

The site is gently sloping towards the seasonal river on its northern side with an average rolling topography of between 0.8% to 3.5%

Vegetation

Sparcely positioned trees and some shrubs scattered here and there form the vegetation. The trees and shrubs are closer to each other towards the river giving a pleasant view.

Accessibility:

The site is accessible from the main road bounding it to the south.

Infrastructure:

The facilities under consideration here include, pipe borne water, drainage and sewer lines. None of these facilities are not available now on the site, but they exist both in the Government Secondary School opposite the site and Sokoto Rima Basin Development Authority sites on the western boundary of the site. So electricity could be tapped from overhead cable on the other side of the road and a small transformer may then be installed for supply to the Comprehensive Health Centre. Pipe borne water can also be tapped from the main line which runs parallel to the site on the Government Secondary School side. (See site analysis.

There is still a need for stand-by generator due to the unreliability of the National Electricity Power Authority, N.E.P.A..

Drainage:

The drainage will be towards the natural slopes of the site, that is towards the river. So all major drains should be directed towards the river.

Odours, Views and other Nuisances:

The site is free from all forms of persistent objectionable odurs. The only source of noise is from the main road which is higher on market days due to so many vehicles going to and from the market. This can be reduced by recessing the whole complex inside and also by additional plantings. The views need improving with adequate landscaping.

Site Concept Evolution

The main Medicare building and its supporting services will be towards the middle of the site due to the good ground cover and the uniform slope around the area.

5.4 Climatic Data

There is no established climatic data of Gutsin-ma therefore the general climatic data of the northern part of Kaduna state (the defunct Katsina Province) was used. The data revealed that each year is characterized by two seasons.

i) A short rainy season during which the passat, known as the south west trade wind blows. This wind is turbulent and brings along with it dark clouds and rains. It is sometimes associated with squall, over pulling roofs.

ii) A long Dry Season characterised by the Harmattan wind known as north - east trade wind. It is also turbulent and sometimes saturated the atmosphere with dust.

5.4.1 Rainfall

The rainy season as mentioned above is short and between the months of May and September. At the beginning of the rainy season, thunderstorm and short sharp showers of rain are noticed. During the later part of the season, the rain lasts for over two hours with alternate heavy and light showers. The highest amount of rainfall is recorded during the month of August (up to 310.5 mm in 1980) See table 6.

TABLE 6 R A I N F A L L

Year / Month	1979 (mm)	1980 (mm)	1981 (mm)	1982 (mm)
January	-	-	-	-
February	-	-	-	-
March	-	-	tr	- tr
April	tr	-	19.5	20.3
May	33.0	93.5	36.2	43.1
June	111.2	122.8	62.1	102.1
July	191.9	280.6	142.8	153.2
August	257.2	310.5	202.5	285.5
Sept.	111.0	67.6	113.8	95.3
Oct.	20.1	35.4	-	19.8
Novemb.	-	-	-	-
Decemb.	-	-	-	-
ANNUAL TOTAL				

See Chart 1.

Source: Federal Ministry of Aviation, Meteorological Division, Kaduna.

5.4.2. Relative Humidity

The mean relative humidity in the area ranges between 23.1 and 78.1 over a period of four years (1979 - 1982). The distribution of the relative humidity is such that 75% of the year have mean relative humidity below 70%, and 25% of the year have mean relative humidity above 70% (See table 7).

5.4.3. Temperature

There are two peaks of high temperature, one before the rainy season in the month of April and after rainy season in the month of December recorded between 1979 and 1982 is 38.8^{o}C and the lowest mean minimum temperature during the same period was recorded as 11.8^{o}C. This shows that the maximum temperature frequently exceeds 35^{o}C and minimum goes lower than 12^{o}C. However the comfortable temperatures range between 20 and 24^{o}C, (see tables 8 and 9).

5.4.4 Geology:

The soil comprises sandy or loamy materials overlying rounded quartz pebbles and clays derived mainly from the weathering of cretaceous congolomerates. The top soil of the whole region is sandy in nature and non - homic [3].

TABLE 7

MEAN RELATIVE HUMIDITY BY MONTH

YEAR / MONTH	1979	1980	1981	1982
January	23.1%	27.5%	29.8%	26.2%
February	23.3%	23.3%	25.5%	23.5%
March	27.0%	20.9%	30.3%	28.2%
April	33.1	27.5%	34.8%	33.1%
May	54.8%	50.0%	39.8%	50.7%
June	66.8%	70.0%	59.6%	68.3%
July	76.1%	76.9%	77.1%	75.5%
August	80.6%	81.5%	76.9%	78.1%
September	73.6%	72.6%	74.2%	75.5%
October	58.3%	58.8%	44.5%	48.8%
November	37.3%	36.8%	30.8%	27.9%
December	31.1%	32.6%	27.9%	34.3%

See graph 2.

Source: Federal Ministry of Aviation, Meteorological Division, Kaduna

TABLE 8

MEAN MAXIMUM TEMPERATURE (^{o}C)

Month / Year	Jan	Feb	March	April	May	June	July	Aug	Sept.	Oct.	Nov	Dec
1979	30.0	33.7	36.6	38.6	37.5	34.5	31.1	30.5	32.4	34.1	34.2	28.3
1980	30.9	32.2	36.6	38.9	36.1	33.2	31.5	30.9	33.3	35.3	33.6	28.2
1981	27.3	32.1	36.1	38.3	37.3	36.1	31.7	31.6	33.0	36.6	30.5	30.5
1982	26.9	32.3	35.9	38.9	36.7	35.2	30.0	30.3	32.7	34.2	29.5	27.8

TABLE 9

MEAN MINIMUM TEMPERATURE (^{o}C)

Month / Year	Jan	Feb	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Decem.
1979	14.6	16.7	22.2	24.2	24.9	23.4	21.3	20.7	21.1	20.7	18.7	13.0
1980	14.2	17.0	24.5	22.1	22.1	21.6	20.5	22.0	20.5	20.7	17.7	12.3
1981	12.8	15.9	20.7	23.8	23.1	23.1	21.7	21.2	21.1	17.5	21.5	11.8
1982	12.8	16.9	21.2	20.5	24.4	21.8	21.4	20.6	21.5	20.0	17.6	11.3

See Graph 1

Source: Federal Ministry of Aviation, Meteorological Division, Kaduna.

FOOT NOTES

Kyaagba J. Adam
Rural Health Centre Makurdi (Prototype)
Un-published M. Sc. Thesis, A.B.U. 1980.

2 & 3 Max Lock Group Nigeria (1978)
Dutsin-ma Master Plan.

CHAPTER SIX

THE MEDICARE CENTRES

The Medicare Centres a is viewed as living bodies that grow over a period of time. The growth should be such that all part develop simultaneously. They are to be seen as single bodies performing all required functions, not as seperate blocks connected by corridors.

6.1 THE DISPENSARY

The Dispensary, as the first stage of the Medicare Centre, is a single block with both the preventive and curative sections combined. The waiting areas is at one end while the dressing/treatment room is at the other. The consulting room is easily accessible from the waiting area (see plan of Dispensary).

6.2 THE HEALTH SUB-CENTRE (H.S.C.)

The Health Sub Centre will render a wider range of Medicare services than the dispensary, hence it requires more units than the Dispensary. Seperation of the male and female patients becomes more important in this centre as the population being served has incfeased.

The H.S.C. comprises of Out-patients Department, Preventive Unit and Ante Natal Unit at the fore part of the whole complex. The nursing units are divided into two; with male and female groups units grouped together, adjascent to the Preventive Units while maternity

unit and Children ward are grouped together, adjascent to the Ante-Natal Clinic. The Maternity Unit is easily accessible from outside. The supporting services are at the back of the centre but connected with a system of corridors. The kitchen, laundry and general store are grouped together with easy access from the service road. The Mortuary and generator house are far away from the nursing units, at the two extreme ends of the centre. (See plan of Health Sub-Centre).

6.3. THE COMPREHENSIVE HEALTH CENTRE (C.H.C.)

This is the third development stage of the Medicare Centres. The growth started from the Dispensary, through the Health Sub-Centre to the C.H.S. It has similar functional layout with the Health Sub-Centre but with higher degree of sophistication. It performs promotive, preventive and curative health services.

6.3.1 Preventive and Promotive Unit:

The Unit deals with immunisation, health education, ante-natal and post natal services. Patients in this unit receive a similar form of treatment, while difficult cases are refered to the adjascent wing housing the female consulting and treatment sections.

6.3.2 Out Patients Department (O.P.D.)

The Out Patients Department is the busiest Department of any Medicare centre. The design of any these units is in such a way that the patients (both male and female) approach the C.M.C. from the same direction, seperation begins from the waiting area. A dual system of design was adopted but both male and female patients share the same Pharmacy Department for their drugs and other medicines. The patients still have seperate sub-waiting areas for the Pharmacy unit. All services provided in the O.P.D. have sub-waiting areas in front of their respective rooms. The Out-Patients Department comprises of the followings:

- Registration and Records Section
- Diagnostic Section
- Treatment Section
- X - Ray and Laboratory

(i) Registration and Records Sections

Patients arriving to the Medicare Centre are registered and provided with cards on which diagnostic and prescriptions are written. This section has seperate male and female/children waiting-areas with the record office at the centre.

(ii) Diagnostic Section:

The sick patient is screened by the nurses or clinical officer and complicated cases are referred to the Medical Officer who is a physician for further examination. The Medical Officer then prescribes treatment for the patient, admit him or her into the nursing unit or refer him or her to a Medicare Centre higher up the ladder. Each of the male and female sections has a Medical Officer.

(iii) Treatment Section:

Having received prescription from the Diagnostic Section, the patient proceeds to the Treatment Section where he or she receives the necessary drugs and treatment. The treatment section comprises of:

- Pharmacy and drugs store for preparing, dispensing and storage of drugs in the best condition required.
- Dressing rooms for dressing of wounds on different parts of the body.
- Injection rooms for patients requiring injections
- Minor theatre for minor surgical attention as suturing of small wounds, opening of obscesses, whitlows, ulcers and removal of foreign bodies. Patients with reducible closed fractures are treated and plaster splints are applied.

(iv) X - Ray and Clinical Laboratory:

The X-Ray section takes shadow pictures of the vital parts of the body for diagnostic purposes. Both ambulant and non ambulant patients are served by the section. The Clinical Laboratory conducts numerous diagnostic tests of tissues of the body. It is adjascent to the X-Ray section and possess seperate male and female toilets for patients from whom specimens are required.

6.3.3. The Operation Theatre and Central Sterilizing Unit

The theatre provided in this comprehensive Health Centre conducts uncomplicated cases; those that the patients being operated are either under spiral short-term anaesthesia.

The Central Sterilizing Unit is adjascent to the Operation Theatre and Laboratory. The Unit supplies all necessary sterile products required by the whole C.H.C. It will also receive used equipments, instruments and materials from various departments for sterilization.

6.3.4 Nursing Units

> "Much attention is given to wards as they form by far the largest single element and are the stage on which the drama of stay in hospital is enacted. Reaction to the wards by patients, their visitors, and the nurses and doctors largely give a hospital its image, be it efficient, homely clinical or daunting..."[1]

The Nursing Units of the C.H.S. are designed as an extension to that of the Health sub-centre. The male and female ward are each grouped round a large courtyard. The children wards are opposite the delivery unit and lying in ward. See plans. Each ward has and outer garden to itself, these gardens (courtyards) serve as an out door ward. It could be used by ambulant patients as their private day-space while the enclosed day-space is for watching T.V., seeing visitors etc. Each pair of wards is approached by corridors at the meeting point of their respective courtyards.

NIGHTINGALE Ward is the type employed in the design. This is the type of wards that beds are arranged perpendicular to the walls with general [illegible] circulation route in the middle of the ward[2]. The floor area per bed is 5.4m^2 and the building width can be as narrow as 6m. This allows for simple roof [illegible] construction, that is more economical and easier to

erect especially in deep rural areas. Supervision of the patients by the nurses is easily from one position and the path from one patient bed to another is very direct[3]. The problem of the poor patient environment due to barrack appearance of rooms by erecting partitions at intervals of 6 beds while that of rows of windows immediately opposite the patient was solved by providing overhang of the roof and sufficient planting to reduce glare. The bed spacing is 2.1m, 900mm wide beds are used with 1.2m space between them.

The delivery unit is directly accessible from outside for admittance of patients in labour or those about to start labour. The unit has an examination room at the reception where patients arriving are either admitted into the wards, the labour room or direct to delivery room. Uncomplicated septic surgery could be conducted in the delivery room. A seperate room is provided to serve as relatives' waiting, for those relatives that insist on remaining in the centre until their patients have delivered.

The spacing of the lying - in ward allows for baby cots to be kept beside the beds. The room for premature babies is provided, it is glazed so that both parents and nurses can see the baby without entering.

Two single-bedroom for special cases as eclampsia patients who need more intensive care are at the extreme end of the ward.

6.3.5. Supporting Facilities:

These are facilities needed for efficient function of the centre. They comprise of:

i) Central kitchen
ii) Laundry
iii) Central store
iv) Maintenance Workshop
v) Generator House
vi) Mortuary.

The Units are located as seperate block away from the Medi-functional Units so as to minimise noise in the quite zones of the C.H.C. Adequate planting is provided for further muffling of the noise generated by these units. (See plan of C.H.C.)

FOOT NOTES

1. Architectural Journal, 28th July, 1982.

2. Muffield Provincial Hospital Trust (1965), Studies in the Function and Design of Hospitals, Oxford University Press, London, New York.

3. Kyaagba J. A. Rural Health Centre Makurdi.(Prototype) Un-published M.Sc. Thesis. A.B.U. 1980.

CHAPTER SEVEN
TECHNICAL CONSIDERATIONS

The construction and supply of other facilities as water to Medicare centres are of great importance, especially when the sites are in deep rural areas. It becomes more important if it is anticipated that the users (peasants in this case) would participate fully in the construction of the Medicare centres.

7.1. Building Construction

It is a well known fact that there is the need for building construction to be up to standard in terms of quality, durability and low maintenance cost in developing countries. This would help in bringing down the initial and running cost of buildings especially in the rural areas.

One of the measures to be taken could be the use of simple prefabricated structures. The standardized posts and beams are outlined clearly and the intervening wall-space can be filled by local participants. This would allow local labour of the peasant to be fully utilized. Thus the peasant can either contribute financially or by physical participation or both in the construction of the Medicare Centres.

Pre fabrication would alsosave a lot of construction materials wastage due to standardization

of constructional details and would help in achieving higher building standards at the same time reducing cost. For the above advantagages to be achieved, the prefabricated structures should be cheaper to produce, light (prefarably lighter than cement), easy to transport without being damaged when stacked, easy and quick to erect on site and with as few structural members as possible[1].

7.1.1 The Structure

Frames and Pannels are to be employed in the construction. The frames consists of 10cm x 10cm hollow steel section (square) and steel angles tying them together. Alluminium corrugated sheets will be used for roofing. They are screwed to the steel sheets, thus the roof loadis transmitted to the hollow steel square columns, Having outlined the building, the space is then filled with non load bearing panels.

7.1.2 Foundation

The load of the superstructure is transmitted as point loads, this suggests the adoption of pad foundation. Pad foundation also have the advantage of employing lesser building materials on sloppy sites.

four steel rods are projected upwards when casting the concrete. This facilities easy fixing of the columns which is done by screwing the base plate tightly through the holes on it.

7.1.3 Floors

The floors will be a 75 millimetres thick concrete floor slab cast on a 25 centimetres layer of well consolidated hardcore of stones, broken blocks or laterite with sand blinding. The top should be smooth enough for use as a finished surface too smooth floor surface can be slippery when wet. The finished floor in theatre suite rooms should be at least 150mm above the surrounding ground level to avoid moisture penetration. However, flooring of the surgical unit should be solid enough to absorb the electrostatic fall out emanating from the anaesthetic machines.

To avoid accidents due to sparks from anaesthetic machines, wire mesh is embedded into the 25 centimetres thick floor slab, cast over 30 centimetres of well consolidated hard - core of laterite. The floor in the operation Theatre also has very smooth finish with no cracks.

7.1.4 Walls

Built up panels which are pre-fabricated and easy to erect and demolish are to be used as walls. The panels are made of plywood with an insulating material.

as saw-dust, rice mill chips, groundnut shells etc, Sandwitched in between. The pannels to be used as external walls would be faced with corrugated alluminium sheets for protection from the weather.

Pannels for use in some rooms need special treatment, These rooms include Operation Theatre, Delivery room, kitchen, and showers. The interior partitions would be faced with rough surfaced alluminium sheets (flat). Internal facing of pannels for the Operation theatre and Delivery room would be of smooth surfaced alluminium sheets for easy cleaning and washing whenever the need arises. 'I' steel channels are used for holding the pannels together both vertically and horizontally. Timber studs are used to close the ends of the pannels, and they allow for screwing of the pannels to the steel channels.

7.1.5 Roofs

Monopitch roofing is to be employed due to the size of the span which is 6 metres with an overhange of 1.8 metres corrugated alluminium was chosen for the roof covering because it is water proof, corrosive proof and easy to erect and maintain.

The direction of laying the sheets should be opposite the prevailing wind. Hook bolts for fixing the roof sheets should never be placed on the valley of the sheets except for facing sheets.

7.1.6 Doors and Windows

Flush doors or pannel doors could be used, while window could be of adjustable louvre. Louvres are cheaper than factory made casement and gives variable ventilation up to almost 100% when fully opened. They give the user an opportunity of controlling the direction of any width of opening can be achieved by simply cutting the glass louvres blades to the correct length and positioning the side frames of the louvres to hold the louvre blades. Buglar proofing can be made by incorporating bars horizontally between each louvre. Where ventillation is needed not light, the glass louvres at that level can be replaced by opaque materials as plywood or by painting the glass pannels while or black for developing room of x-ray units.

7.2. BUILDING SERVICES

Water and Sanitary services are important in the design of Medicare centres. The improper design of these services may be dangerous to the health and well being of the patients and staff.

7.2.1 Water Supply

Adequate and suitable water supply system must be ensured before building commences. In rural areas, the use of Lift Pumps popularly known as Bore-Holes can be employed.

Where finance permit, the pump could be connected to a plant that would draw the water and store it in a storage tank. The water stored in this case may be used by the peasants in the immediate environment. The storage tank should be big enough to serve both purpose or two tanks provided, one for the centre and other for pub ic use.

Units that water is very critical to their functions as the theatre, laundry, laboratory, delivery may have seperate small tanks in cases of repairs going on in the sup ly systems.

7.2.2 Waste Disposal

As public sewers are not available, septic tank system is employed . It provides the first stage of the sewage treatment by liquifying solid matters by bacterialytic action[2]. The affluent is then discharged into a soak away pit at least 15m from the nearest building.

7.3. ACOUSTIC AND SOUND CONTROL

The control of unwanted noise in Medicare centres is of great importance as it presents a serious problem to both patients and medical saff.

A sound measurement survey of noise source in Hospitals jointly conducted by the investigations and Building Research Station and Nuffield Provincial Hospitals Trust identified the following sources:

I) Corridors

II) Door openings

III) Sanitary fitting

IV) Noisy departments include

- Central kitchen
- Laundry
- Maintenance Workshop
- Sterillizing Department[3].

The most effective method of controlling noise is at the source by providing sound reducing walls and floors between the source of noise and the patients or by applying absorbents to surfaces in areas where non-noise is likely to occur.

Noisy service corridors in nursing units were moved far from the nursing wards. Noisy departments are sited in remote areas to prevent noise disturbances.

7.4. Fire Protection in Medicare Centres

The problem of fire outbreak in Medicare Centres should be minimized or eliminated as the result is bound to be more serious than in other centres. This is because many of the patients in the Nursing Units are not ambulant as such have to be helped to move. The design is therefore required to discourage the risk of small fire developing into a serious one. All Departments units with high fire risk as kitchen,

maintenance workshops, generator house are positioned a away from the main medi functional units. This will minimise the chances of fire spreading to buildings with least fire risks, as the Nursing Units.

FOOT NOTES

1. R.I.B.A. London (1965).
The coordination of dimensions for buildings

2. Tukur Sa'ad (1976)
Services 1, Water Supply, Drainage and Sewage system" Lecture Notes.

3. Nuffield Provicial Hospitals Trust (1965)
Studies in the Functions and Design of Hospitals, Oxford University Press, London, New York.

4. Kyaagba J. A. "Rural Health Centre Makurdi"
Un-published M.Sc. Thesis, A.B.U. 1980.

CHAPTER EIGHT
ACCOMMODATION AND SPACE REQUIREMENTS

A research of the existing facilities was conducted for familiarization with the room functions in order to achieve the spaces needed and their respective floor areas. This became necessary as the areas achieved through practical observations of the existing room sizes and the activities that go on within them allows determination of their adequacy or inadequacy.

The analysis revealed that many functions in the Medicare Centre can take place within rooms of some basic sizes by just changing the furniture arrangement within the room. For example, the size of a room for consultation (3m x 4.2) can serve as an X - Ray room, recovery in the theatre, Pharmacy in the Health sub centre, an office, a small Laboratory etc, by changing the furniture arrangement This has increased the flexibility of the design.

Three basic sizes are adopted for the purpose of this thesis, they are given some symbols in order to make it easier to understand.

The probable functions each room size could take are as stated below:

(i) n = 1.80m x 2.40m = $4.32m^2$

- Area sufficient for a bed space around it
- Size of clean and dirty linen storages
- Equipment and drug store.

(ii) C - 3.00m x 4.20m = 12.60m^2

- Consulting room
- Small Pharmacy
- Small drug store
- Minor theatre
- Office
- Small Laboratory
- X - ray room
- Premature babies' room (4 cribs)

(iii) P = 4.20m x 4.20m = 17.64m^2

- Kitchen
- Operation theatre
- Central Sterilizing room
- Delivery room

8.0. SCHEDULE OF ACCOMMODATION

8.1. The Dispensary:

	Space Designation	Component	Number required	Total area (m^2)
1.	General Waiting and Registration	P	1	17.64
2.	Consultation/Examination Room	C	1	12.60
3.	Health Office	C	1	12.60
4.	Treatment Room	P	1	17.64
5.	Store	n	2	8.70
6.	Toilets	n	1	4.32
7.	Circulation	n	8	34.56

Total built up area for a Dispensary is:

2P + 2C + 11n = 108.06m^2

8.2. Health Sub - Centre

8.2.1 Administration

	Space Designation	Component	Number required	Total Area (M^2)
1.	Principal Nursing Officer	C	1	12.6
2.	Clerks Office	C	1	12.6
3.	Store	n	2	8.7
4.	Staff toilets	n	1	4.32
5.	Circulation	n	3	12.96

Total = 2C + 6n = $51.18m^2$

8.2.2 Preventive Unit

	Space Designation	Component	Number required	Total Area (m^2)
1.	Health Office	C	1	12.60
2.	Consultation/Examination	C	1	12.60
3.	Sanitary Office	C	1	12.60
4.	Immunisation Office	C	1	12.60
5.	Records	n	2	8.64
6.	Sub Waiting Store	n	2	8.64
7.	Sub Waiting	P	1	17.64
8.	Circulation	n	5	21.60

8.2.3. Out Patients Department (O.P.D.)

Reception and main male and female waiting P 6 105.84

Diagnostic Unit

	Space Designation	Component	Number required	Total area (M^2)
1.	Sub Waiting	P	1	17.64
2.	Male consulting/Examination Room	C	3	37.80
3.	Female consulting/Examination Room	C	3	37.80
4.	Routine Laboratory	C	1	12.60
5.	Laboratory Store	n	2	8.64
6.	Circulation	n	8	34.56

Total = 7P + 7C + 10n = $254.88m^2$

Treatment Unit

	Space Designation	Component	Number required	Total area (M^2)
1.	Sub - Waiting (Male & Female)	P	4	70.56
2.	Dressing room	C	2	25.20
3.	Nurses rest room	C	2	25.20
4.	Injection room	C	2	25.20
5.	Central drug store	P	2	35.28
6.	Dispensing room (Male and Female)	P	1	17.64
7.	Toilets and stores	n	6	25.92
8.	Circulation	n	12	51.84
9.	Staff toilets	n	2	8.54

Total = 5p + 6C + 20n = $285.48m^2$

NOTE: The injection and Dressing rooms are divided equally among male and female patients. Both of them share the same Central Drug store and Dispensing. The toilets are also seperate but equally divided.

8.3.4. Ante Natal Unit

	Space Designation	Component	Number required	Total Area(m^2)
1.	Waiting	P	2	32.28
2.	Records	n	2	8.32
3.	Consultation	C	2	25.20
4.	Examination	C	1	12.60
5.	Store	C	1	12.60
6.	Nurses Rest Room	C	1	12.60
7.	Circulation	n	7	30.24

Total = 2P + 5C + 9n = 133.84m^2

8.2.5. Maternity Unit

	Space Designation	Component	Number required	Total Area (m^2)
1.	Reception	P	1	17.64
2.	First Stage Labour room (2 beds)	P	1	17.64
3.	Sterilizing room	n	1	4.32
4.	Delivery Room	P	1	17.64
5.	Toilet	n	2	8.64
6.	Dirty linen storage	n	1	4.32
7.	Clean Linen Storage	n	1	4.32
8.	Nurse work room	C	1	12.60
9.	Lying-in ward (6 beds)	n	6	25.92
10.	Showers	n	2	8.64
11.	Utility Store	n	2	8.64
12.	Relatives' Waiting	p	1	17.64
13.	Day - Space	P	1	17.64
14.	Pre-mature cubicles	C	1	12.60
15.	Circulation	n	14	60.48

Total = 5P + 2C + 29n = 238.68.

8.2.6. Nursing Unit - Male ward

	Space Designation	Component	Number required	Total Area (m^2)
1.	Male ward (12 beds)	n	12	51.84
2.	Isolation room	n	1	4.32
3.	Nurse workroom	C	1	12.60
4.	Linen store	n	1	4.32
5.	Day - space (indoor	P	1	17.64
6.	Utility store	n	1	4.32
7.	Toilets	n	2	8.64
8.	Shower	n	1	4.32
9.	Outdoor day space	n	8	34.56
10.	Circulation	n	12	51.84

Total = P + C + 38n = $194.40m^2$

The female and children wards has the same facilities as the male ward, hence the same space is required.

Space required = 2P + 2C + 76n = $388.8m^2$

8.2.7 Supporting Facilities

These are facilities that are necessary for the smooth running of the centre.

A - Kitchen

	Space Designation	Component	Number required	Total Area (m^2)
1.	Indoor Cooking	P	2	35.28
2.	Vegetable Store	P	1	17.64
3.	Dry-Goods Store	C	2	25.20
4.	Kitchen Staff changing	C	1	12.60
5.	Outdoor Cooking	P	2	35.28
6.	Catering Officer	C	1	12.60
7.	Circulation	n	8	34.56

Total = 5P + 4C + 8n = $173.16m^2$

B - LAUNDRY

	Space Designation	Component	Number required	Total Area (m^2)
1.	Drying space	P	2	35.28
2.	Washing space	P	2	35.28
3.	Staff Changing	C	1	12.60
4.	Clean Linen Store	n	3	12.96
5.	New Linen Store	n	3	12.96
6.	Toilets	n	2	8.64
7.	Laundry Supervisor	C	1	12.60
8.	Circulation	n	10	43.20

Total = 4P + 2C + 20n = $173.52m^2$

C - Central Store and Maintenance

	Space Designation	Component	Number required	Total Area (M^2)
1.	Receiving	C	2	25.20
2.	Central Store	P	3	52.92
3.	Carpenter's Workshop	P	1	17.64
4.	Generators House	P	2	35.28
5.	Control Room	C	1	12.60
6.	Fuel Storage	C	1	12.60
7.	Circulation	n	4	8.64

Total = 4P + 4C = $164.8m^2$

D - Mortuary

This is the unit that receives dead patients from the nursing unit.

	Space Designation	Component	Number required	Total Area (M^2)
1.	Receiving	C	1	12.60
2.	Autospy	C	1	12.60
3.	Body Storage	C	1	12.60
4.	Body Washing	F	1	17.64
5.	Store	n	1	4.32
6.	Toilet and shower	n	1	4.32

Total = F + 3C + 2n = $64.08m^2$

From above schedule, the total number of components and floor area required by the Health Sub-Centre are as follows:

37 + 42C + 227n = $2162.52m^2$

8.3. THE COMPREHENSIVE HEALTH CENTRE (C.H.C.)

8.3.1. Administration

The Administrative staff are distributed over the out patients Department. This is because some of them also function in the Out Patients Department. For example, the Chief Medical Officer who is the chief Administrative Officer also attend to patients refered to him by the nurses as well as patients in the nursing units.

	Space Designation	Component	Number required	Total Area (M^2)
1.	Office of Chief Medical Officer	P	1	17.64
2.	Office of Principal Nursing Officer	C	1	12.60
3.	General Office	P	1	17.64
4.	Accounts Office	C	1	12.60
5.	Circulation	n	6	25.92

Total = 2P + 2C + 6n = $56.36m^2$

8.3.2 Preventive Unit

	Space Designation	Component	Number required	Total Area (M^2)
1.	Health Office	C	1	12.60
2.	Health Assistant's Office	C	1	12.60
3.	Sanitary Office	C	1	12.60
4.	Immunization Office	C	1	12.60
5.	Consulting/Examination Room	C	2	25.20
6.	Records	n	2	8.64
7.	Waiting	P	1	17.64
8.	Store	C	1	12.60
9.	Circulation	n	7	30.24

Total = P + 6C + 9n = $144.72m^2$

8.3.3. Out Patients Department (O..P.)

i) Records and Registration

	Space Designation	Component	Number required	Total Area (M^2)
1.	General Waiting (male)	P	4	70.56
2.	General Waiting (Female)	P	4	70.56
3.	Registration room	C	2	25.20
4.	Central Records	P	2	32.28
5.	Files Store	P	1	17.64

Total = 11P + 2C = 216.24m^2

ii) Diagnostic Unit

	Space Designation	Component	Number required	Total Area (M^2)
1.	Sub Waiting	P	1	17.64
2.	Consulting	C	6	75.60
3.	Examination	C	2	25.20
4.	Eye Clinic	C	1	12.60
5.	E.N.T. Clinic	C	1	12.60
6.	Laboratory	C	2	25.20
7.	Laboratory Store	C	1	17.64
8.	X-Ray and Reception	C	2	25.20
9.	Darkroom and Store	n	1	4.32
10.	Toilets	h	2	8.64
11.	Circulation	n	16	69.12

Total = 2P + 14C + 19n = 293.76 M^2

iii) Treatment :

	Space Designation	Component	Number required	Total Area (M^2)
1.	Sub Waiting	P	3	62.92
2.	Dressing Room	C	2	25.20
3.	Injection Room	C	3	37.80
4.	Minor Theatre	C	2	25.20
5.	Pharmacy	P +2C	1	12.84
6.	Central Drugs Store	P	4	70.56
7.	Toilets	n	5	21.60
8.	Store	n	4	17.28
9.	Circulation	n	12	51.84

Total = 8P + 9C + 21n = 315.60m^2

8.3.4. Ante Natal

	Space Designation	Component	Number required	Total Area (M2)
1.	Waiting	P	2	35.28
2.	Records	n	2	8.64
3.	Consultation	C	2	25.20
4.	Examination	C	2	25.20
5.	Dispensary	C	1	12.60
6.	Drug Store	n	1	4.32
7.	Nurses Rest Room	C	1	12.60
8.	Toilets	n	3	12.96
9.	Circulation	n	8	34.56

Total = 2P + 6C + 14n = 171.09m^2

8.3.5. Emergency Unit

	Space	Component	Number required	Total Area (M^2)
1.	Examination room	C	1	12.60
2.	Treatment room	C	1	12.60
3.	Observation room	P	1	17.64
4.	Consultation	C	1	12.60
5.	Toilets	n	3	12.96
6.	Sub Waiting	n	4	17.28
7.	Store	n	1	4.32
8.	Circulation	n	6	25.92

Total = P + 3C + 14n = 115.92m^2

8.3.6. Surgical and Central Sterilizing Unit

i) Operation Theatre

	Space Designation	Component	Number required	Total Area (M^2)
1.	Reception	C	1	12.60
2.	Records	n	2	8.64
3.	Store	C	1	12.60
4.	Recovery/Preparation	P	1	17.64
5.	Anaethesia	C	1	12.60
6.	Operation Theatre	P	1	17.64
7.	Sterile Store	n	1	4.32
8.	Sterilizing room	P	1	17.64
9.	Scrub-up	n	1	17.64
10.	Doctors' changing	n	1	4.32
11.	Nursing Changes room	n	1	4.32
	ii. Central Steriling Unit			
12.	Receiving and Sorting	C	1	12.60
13.	Sterile Store	P	1	17.64
14.	General Sterilization Room	P	1	17.64
15.	Toilets	n	1	4.32
16.	Circulation	n	5	21.60

Total = 5P + 4C + 12n = 194.76m^2

8.3.7 Maternity Unit

	Space Designation	Component	Number Required	Total Area (M^2)
1.	Reception	C	1	12.60
2.	Examination Room	C	1	12.60
3.	Labour room	P	1	17.64
4.	Store	n	2	8.64
5.	Clean Linen	n	1	4.32
6.	Dirty Linen	n	1	4.32
7.	Scrub up	n	1	4.32
8.	Delivery Room	P	1	17.64
9.	Relatives' Waiting	P	2	35.28
10.	Patients Store	C	1	12.60
11.	Lying in ward 12 beds	n	12	51.84
12.	Nurses workroom	C	1	12.60
13.	Premature Cubicles (4cots)	C	1	12.60
14.	Isolation Room	n	1.	4.32
15.	Toilets	n	2	8.64
16.	Showers	n	1	4.32
17.	Circulation	n	16	69.12

Total = 4P + 5C + 38n = 297.72m^2

8.3.8 Nursing Units

All facilities provided in this centre are two times those in the Health Sub-Centre, thus the area is double that provided in the Health sub-centre.

Therefore the components required for the Nursing units are as follows:

6P + 6C + 228n = 1166.40m^2

8.3.8. Supporting Facilities

A - Kitchen

	Space Designation	Component	Number required	Total Area (M^2)
1.	Indoor Cooking	P	3	52.92
2.	Vegetable Store	P	1	17.64
3.	Dry Goods store	C	3	37.80
4.	Staff changing	C	1	12.60
5.	Outdoor Cooking	P	3	52.92
6.	Catering Manageress	C	1	12.60
7.	Circulation	n	12	51.84

Total = 7P + 4C + 12n = 238.32m^2

B - Laundry:

	Space Designation	Component	Number required	Total Area M^2)
1.	Washing space	P	3	52.92
2.	Drying Space (indoor)	P	3	52.92
3.	Staff changing	C	1	12.60
4.	Clean linen store	C	2	25.20
5.	New Linen Store	P	1	17.64
6.	Laundry Supervisor	C	1	12.60
7.	Toilets	n	2	8.64
8.	Circulation	n	10	43.20

Total = 7P + 4C + 12n = 238.32m^2

C - Central Store and Maintenance

	Space Designation	Component	Number Required	Total Area (M^2)
1.	Receiving	C	2	25.20
2.	Central Store	P	5	8.20
3.	Carpenters workshop	P	2	35.28
4.	Plumber	P	1	17.64
5.	Electrician	n	2	25.20
6.	Generator House	P	2	35.28
7.	Control room	C	1	12.60
8.	Fuel Storage	C	1	12.60
9.	Toilets	n	3	12.96
10.	Circulation	n	8	34.56

Total = 10P + 4C + 13n = $219.52m^2$

D - Mortuary

As it is not hoped that many people would die in this centre due to the scope of its services, the size of the Mortuary is the same as that of Health sub-Centre. That is: P + 3C + 2n = $64.08M^2$.

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APPENDIX

MEDICAL INSTITUTIONS BY LOCAL GOVERNMENT, POPULATION AND KIND OF OWNERSHIP AS AT DECEMBER 1982

Local Govt. Area	1980 Projected Population	Federal Goverment	State Govt.	Local Govt.	Mission	Total
Katsina	678,980	-	6	19	-	25
Funtua	672,402	7	2	32	-	41
Dutsin-ma	659,870	-	2	29	-	31
Mani	591,949	-	1	36	-	37
Kankiya	601,795	-	1	25	-	26
Malunfashi	444,568	8	-	30	1	39
Dauda	414,007	-	2	31	-	33
Zaria	591,950	1	4	37	-	42
Birnin Gwari	047,637	-	1	10	-	11
Kachia	474,111	-	1	26	1	28
Ikara	473,053	11	-	37	-	48
Saminaka	304,583	-	1	23	7	31
Jama'a	352,182	-	4	29	3	36
Kaduna	542,154	5	16	11	1	33
TOTAL	6,854,241	32	11	366	13	461

NOTE: Mobile Clinics, Health Offices and Leprosy Treatment posts not included.

SOURCE: Health Management Board, Medical Records Division, Kaduna

NUMBER OF MEDICAL INSTITUTIONS CLASSIFIED BY TYPE AND LOCAL GOVERNMENT AREA AS AT DECEMBER 31st 1983

Health Office		General Hospital	Dispen-sary	Leprosy Treatment Post	Maternity Hospital	Opthalmic Clinic	Dental Clinic	Rural Hosp.	Mobile Clinic	Leprocarium Hosp.	Psychiatric Hospital	Mental Assylum
Katsina	2	1	13	26	1	1	1	1	1	1	-	1
Funtua	2	1	21	24	1	-	1	-	-	-	-	-
Dutsin-ma	2	2	17	22	-	-	-	-	-	-	-	-
Mani	2	-	26	25	-	-	-	1	-	-	-	-
Kankiya	2	-	22	31	-	-	-	-	-	-	-	-
Malumfashi	2	1	25	27	-	-	1	-	-	-	-	-
Daura	2	1	29	18	-	-	-	-	-	-	-	-
Zaria	2	3	28	28	-	1	1	-	1	1	-	-
Birnin-Gwari	2	1	09	14	-	-	-	-	-	-	-	-
Kachia	2	1	24	13	-	-	-	-	-	-	-	-
Ikara	2	-	22	18	-	-	-	1	-	-	-	-
Saminaka	2	1	22	24	-	-	-	-	-	-	-	-
Jema'a	2	1	21	12	1	1	1	-	1	-	-	-
Kaduna	2	7	5	-	-	1	1	-	2	-	2	-

Source: Records Division, Health Management Board, Kaduna State.

ATTENDANCES BY TYPE OF MEDICAL INSTITUTIONS
AND YEAR IN KADUNA STATE

	1981		1982		1983	
	General Hospital	B.H.S.S.	General Hospital	B.H.S.S	General Hospital	B.H.S.S
Out-Patients	1,724,894	302,883	2,561,891	576,998	2,591,243	593,524
In-Patients	52,292	-	71,249	1135	90,058	1316
Ante-Natal	140,066	15,888	146,634	50,302	181,969	69,981

NOTE: B.H.S.S. is Basic Health Services Scheme.

SOURCE: Health Management Board, Medical Records Division, Kaduna

TABLE 5

AVERAGE WEEKLY, MONTHLY AND YEARLY ATTENDANCE BY DISPENSARIES OF DUTSIN-MA LOCAL GOVERNMENT AREA.

YEAR OPENED	PLACE	1979		1980
		Weekly	Monthly	Yearly
1941	Dutsinma	254	1,000	13,198
1951	Gabbari	236	1,004	12,051
1951	Kurfi	404	1,749	20,982
1956	DanMusa	442	1,915	22,982
1958	Unfana	308	1,335	16,021
1960	Mantumaki	286	1,672	20,063
1962	Funka	379	1,642	19,702
1964	Mundaka	387	1,677	20,125
1973	Zakka	223	971	11,652
1974	Rawayau	274	1,186	14,237
1978	Tsauri	266	1,584	19,011
1978	Kandawa	233	1,010	12,125
1979	Tankiya	358	1,434	17,203
1979	Maidabino	350	1,402	16,821
1981	Dandire	-	-	-
1981	Kuri	-	-	-
1981	Mallamawa	-	-	-
	TOTAL	4,500	19,581	236,173

NOTE: The Dispensaries don't function during the Rainy Seasons.

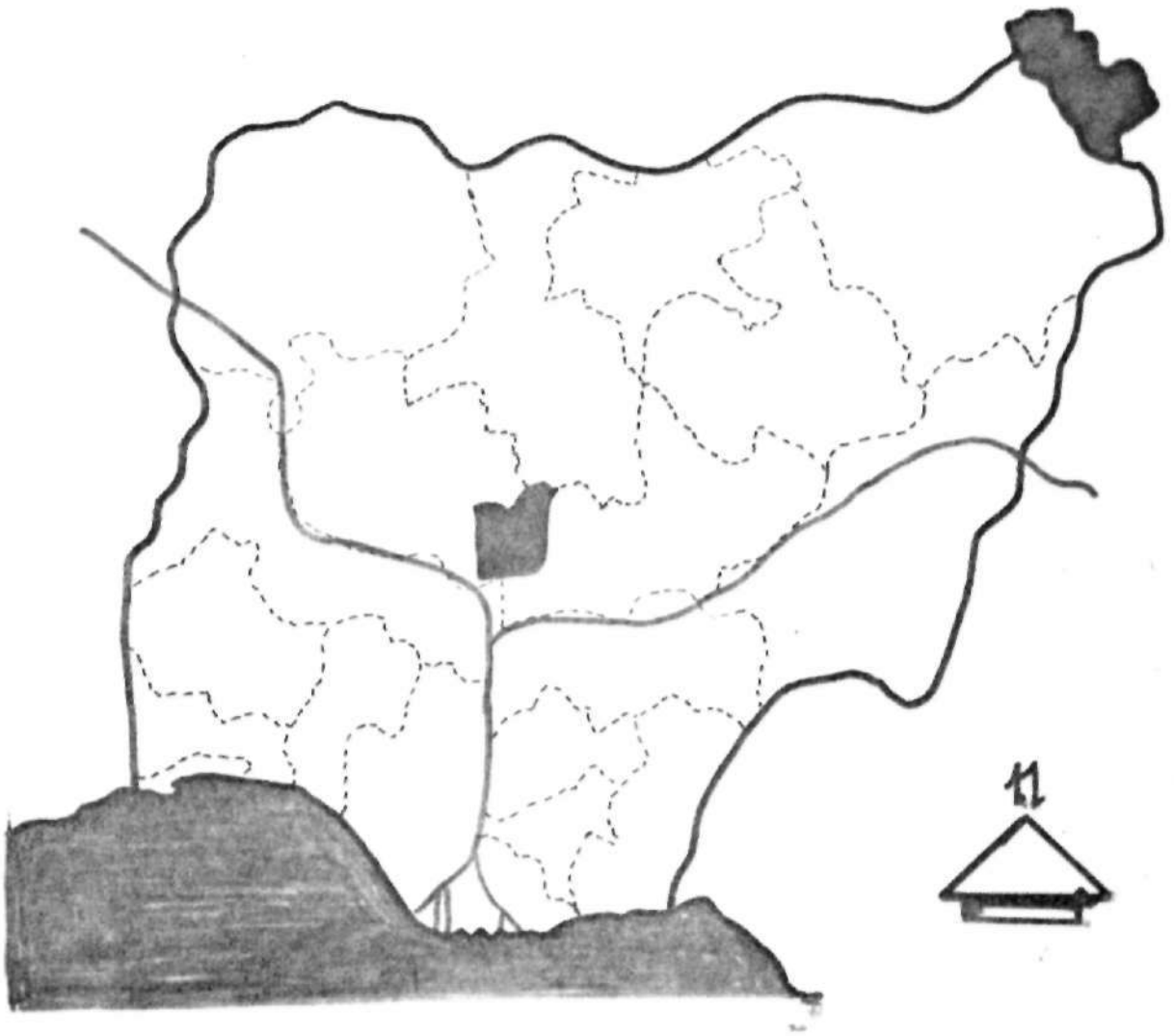
SOURCE: Health Department, Dutsin-Ma Local Government Katsina State.

TABLE 5.

AVERAGE WEEKLY, MONTHLY AND YEARLY ATTENDANCE
BY DISPENSARIES OF DUTSIN-MA LOCAL GOVERNMENT AREA

P L A C E	1981 and 1982		
	Weekly	Monthly	Yearly
1. Dutsin-ma	275	1,192	14,301
2. Batsari	310	1,343	16,121
3. Kurfi	462	2,001	24,012
4. Danmusa	481	2,084	25,009
5. Safana	362	1,568	18,821
6. Yantumaki	440	1,909	22,903
7. Runka	400	1,734	20,802
8. Yandaka	479	2,077	24,922
9. Zakka	240	1,069	12,468
10. Rawayau	326	1,414	16,963
11. Tsauri	406	1,758	21,098
12. Kandawa	251	1,086	13,032
13. Tsaskiya	369	1,578	18,935
14. Maidabino	350	1,517	18,203
15. Dandire	313	1,354	16,251
16. Kuki	253	1,096	13,153
17. Mallamawo	319	1,382	16,579
TOTAL	6,036	26,162	313,573

SOURCE: Health Department, Dutsin-ma Local Government Kaduna State.



map 1

Nigeria political.



map 2

Kaduna State political.
scale : 1 : 1,250,000

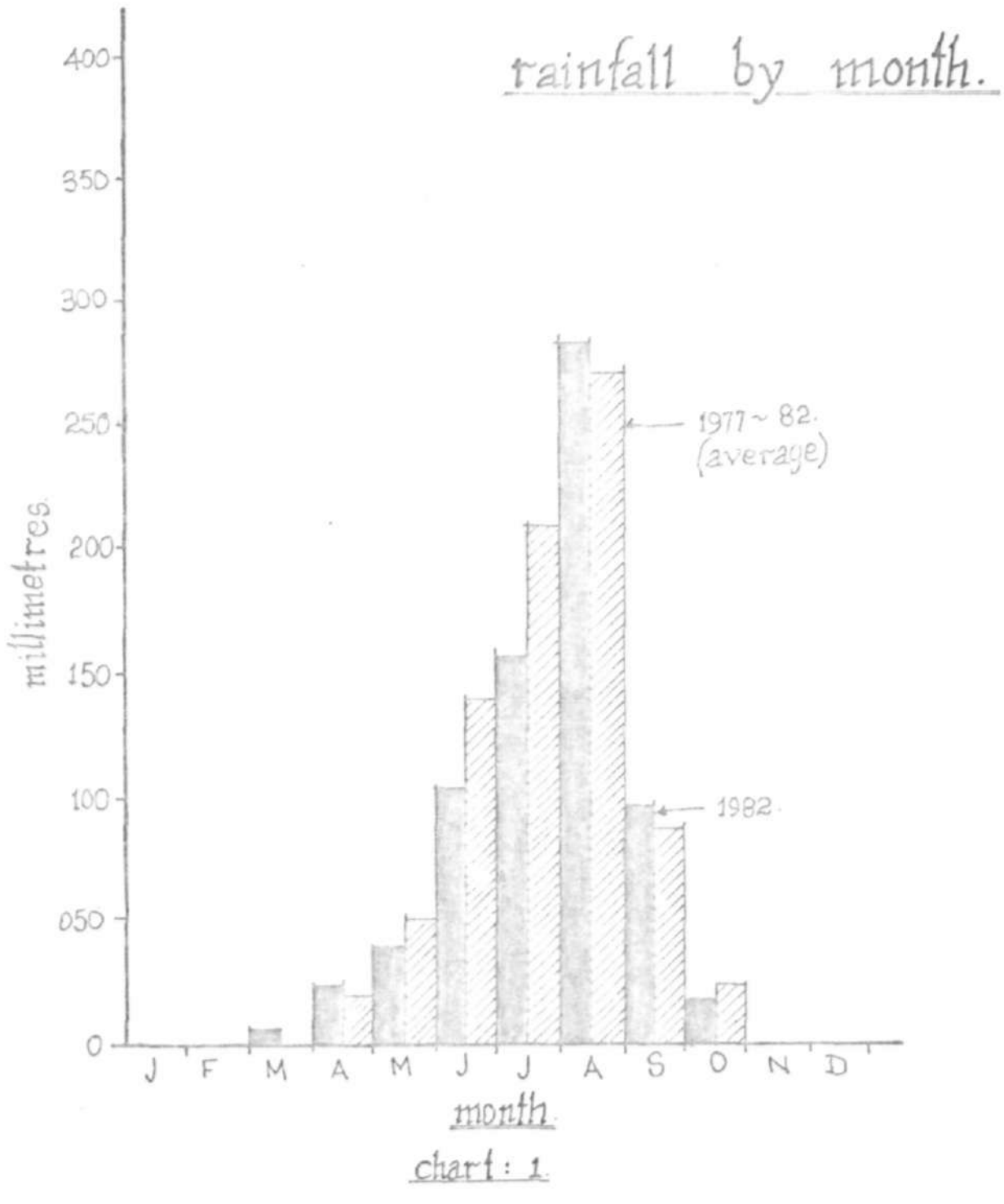
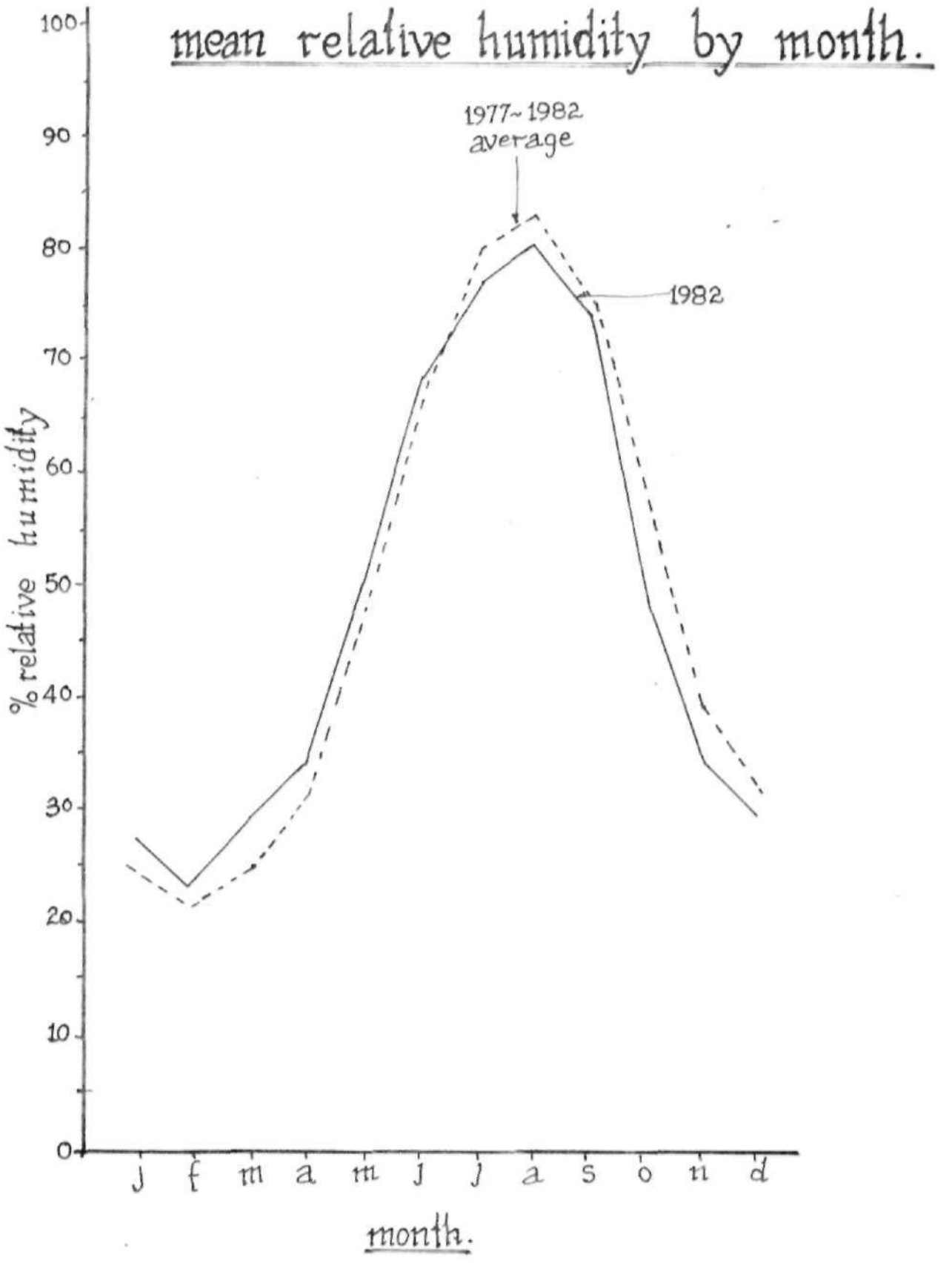
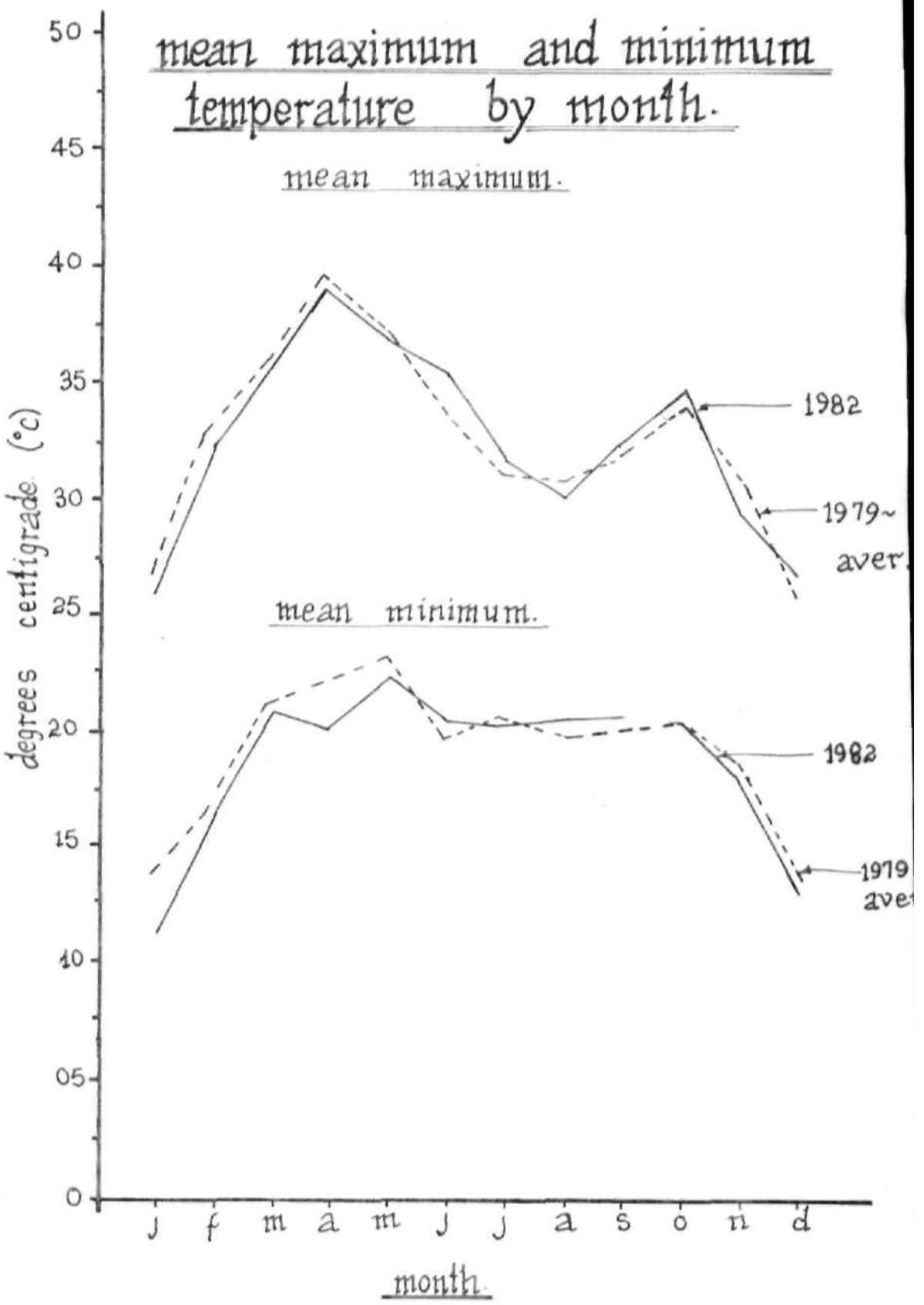

rainfall by month.
400
350
300
250
200
150
100
050
0
millimetres
1977 ~ 82.
(average)
1982
J F M A M J J A S O N D
month

chart : 1


mean relative humidity by month.
1977~1982 average
1982
% relative humidity
100
90
80
70
60
50
40
30
20
10
0
J f m a m J J a s o n d
month.

graph: 2.


mean maximum and minimum temperature by month.
mean maximum.
mean minimum.
1982
1979~
aver
1982
1979
ave
degrees centigrade (°c)
50
45
40
35
30
25
20
15
10
05
0
j f m a m j j a s o n d
month.

graph : 1.