PROVISION OF EFFECTIVE RURAL HEALTH CARE SERVICES IN PANKSHIN LOCAL GOVERNMENT AREA OF PLATEAU STATE

BY

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DECLARATION

I hereby declare that this Thesis has been undertaken by me and that it is a record of my own research-work. It has not been submitted before in any previous application for a higher degree. All the sources of information are specially acknowledged by means of references.

Datong, Michael Dawam

Date: 8-12-88

C E R T I F I C A T I O N

This thesis titled PROVISON OF EFFECTIVE RURAL HEALTH CARE SERVICES IN PANKSHIN LOCAL GOVERNMENT AREA OF PLATEAU STATE by Datong, Michael Dawam meets the regulations governing the award of Master of Science in Rural Development, Postgraduate School, Ahmadu Bello University, Zaria, and is approved for its contribution to Scientific knowledge and literary presentation.

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DEDICATION

This Thesis is dedicated to the memory of my brother, Dateer Datong, who left this world on 17th October, 1988. May his soul rest in perfect peace. Amen. And to my youngest son Yilsen M. Datong, born on 17th September, 1988 and his grandmother, Ma Nawak Datong.

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ABSTRACT

The importance of health for the development of any nation cannot be overemphasized. A healthy populace is essential for the rapid socio-economic development of any nation. Health comes next to education in the development of human resources. Education facilitates general enlightenment and this fosters a change in attitude and habits which may be conducive to the attainment of a higher health status, particularly in the rural areas where the major causes of deaths are largely preventable. The provision of effective rural health care services to prevent or reduce health problems is therefore a necessity for the overall social and economic development of the rural communitities in particular and the nation in general.

Government health policies have been based on the very costly Euro-American model of health care delivery system centred on modern doctor-medicine which is accessible to only a few elites and the urban dwellers to the utter neglect of rural communities. Pankshin LGA of Plateau state covered in this study typifies a rural area characterised by a poor health care system has been chosen for this study.

A number of hypotheses were formulated about the major diseases and health problems related to the environmental and socioeconomic characteristics of the rural communities, spatial distribution of health care services in the area, socio-economic status of the rural inhabitants and accessibility to and utilization of health care services, and the utilization of traditional health care system.

The results of the tests of the hypotheses reveals that there is a spatial variation in the distribution of some diseases most especially, schistosomiasis, onchocerciasis and filariasis which vary with the topography of the area. Malaria, dysentery, pneumonia and helminthiasis which cut across the topography of the area are some of the major diseases that cause morbidity and mortality among the rural inhabitants of Bankshin LGA. The major diseases are also more strongly associated with the environmental and socio-economic characteristics of the rural communities.

The findings further reveal that there is a significant disparity in the spatial distribution of health care services in the area in which the rural communities are at a disadvantage. Apart from the

spatial disparity, the health care delivery system is grossly understaffed hence the entire population is not adequately covered by the health care services.

The results of the tests of the hypotheses further reveal that infants and young children share a disproportionately large burden of morbidity and mortality in the rural areas of Pankshin LGA. The rural inhabitants who are of lower socio-economic status tend to have higher prevalence of health problems and less access to and utilization of the health care services in the area and consequently they patronize the traditional health care system.

To provide effective rural health care services to the rural inhabitants, the present system needs drastic reorganization that would make the services more accessible to the rural dwellers irrespective of their socio-spatial characteristics. In view of this a modest PHC health care system has been proposed where emphasis is focussed on the establishment of simple health care centres in the rural areas and with special attention on the preventive health care measures where the rural inhabitants are to participate actively in the health care activities.

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CHAPTER ONE

1. INTRODUCTION

Health is wealth. Once health is lost all is lost. Lack of good health adversely affects human productivity irrespective of the nature of the job. A nation's manpower is its wealth because a healthy population provides a qualitative and quantitative human resources for developing such a nations' natural resources both domestic and imported, for the improvement of quality of life of the people.

Appropriate provision and equitable distribution of health care services are therefore, very indispensible for rapid economic development in any country in the world. This is because for all human societies, no matter whatever level of development they are, the availability of appropriate health care services among other things determines to a large extent the socio-economic development of the population. If our current rural development drive is to succeed diseases which badly affect rural dwellers such as air-borne diseases, malaria, onchocerciasis, schistosomiasis and diarrhoeal diseases to mention a few, must be controlled and if possible totally eradicated. The importance of good health services in the rural development effort was emphasized in the third

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national development in these words:

> ".....the main objectives of rural development are to increase rural productivity and income, diversify rural economy and generally enhance the quality of life in the rural areas ..... in addition to raising agricultural productivity, effort will be made to enhance the quality of life in the rural areas through the provision of basic social amenities such as health centres, pipe - borne water, feeder roads and electricity" (Federal Government of Nigeria, 1975, p. 292).

Despite the crucial role adduced to good health status and the pronouncement made by government, the provision of appropriate health care services in most of the developing countries, particularly to the rural areas, has been very marginal or virtually nonexisting. The explanation often given is lack of funds and other resources to provide such facilities to the rural sector where over 75% of the population reside. Again people living in the rural areas are rarely seen by health personnel either because of bad roads that make travelling difficult or they consider the rural areas as very unattractive, lacking basic amenities. In such cases the sick have to travel long distances to the health centre or make do with the medical facility provided by the local traditional healers.

In this perspective, therefore, appropriate steps should be taken for the provision of effective health care services to the rural areas which will go a long

way to improving the well-being of the rural inhabitants who form the majority in most developing countries.

1.1 Statement of Research Problem

According to the 1963 census about 80.7% of Nigeria's population lived in the rural areas with agriculture as the main occupation. Poverty, inequality in income, under employment and the lack of basic social amenities and services such as good educational facilities, health care services, potable water supply, good transport networks, appropriate industries (Olatunbosun, 1975) and sources of energy were the main characteristics of these rural areas. For the past two decades, the federal government of Nigeria had pursued development strategies which primarily aimed at economic growth and of late the Integrated Rural Development and the River Basin Development Strategies, whose focus is on modernization of agriculture with the ultimate aim of increased output for export. Health care as a social service is not considered seriously in these development packages as a way of improving the quality of life of the rural populace. This situation is illustrated in Table 1.1 for the national capital expenditure in the 1986 and 1987 national budgets.

Table 1.1

Federal Government of Nigeria Budgets for 1986 and 1987 - Capital Expenditure

Ministry/Department	Allocation (₦)	
	1986	1987
Rural Development	491,540,929	70,499,930
Agriculture (Crops)	215,361,156	170,068,000
Livestock	31,070,358	12,699,000
Fisheries	5,500,000	4,419,000
Agriculture Co-operative	1,800,000	2,595,000
Water Resources	141,052,157	99,913,000
Communications	97,787,507	52,158,990
Industries	336,181,157	131,249,930
Trade	185,925,660	3,998,858
Information & Culture	-	2,607,950
Social Development		
Youth and Sports	4,627,274	3,303,40[illegible]
Health	81,200,000	69,545,320
Mining and Quarying	88,[illegible]60,000	52,158,99[illegible]
Power (NEPA and Electrication	121,000,000	34,772,660
Steel	357,[illegible]99,842	104,3[illegible]
Petroleum and Energy	400,000,000	104,317,980
Transport (all types)	418,345,414	312,953,940

Ministry/Department	Allocation 1986 (₦)	1987
Education (including NUC)	442,047,000	39,090,640
Defence	164,666,000	92,147,549
Science and Technology	7,000,000	6,954,532
Environment	1,000,000	918,475
Housing	50,207,000	63,576,837
Surveying and Mapping	8,800,000	3,757,892
Employment, Labour and Productivity	2,548,250	3,651,129
Prisons	3,000,000	5,000,000
Police	206,000,000	13,461,263
Federal Capital Territory	200,000,000	34,772,660
General Administration	191,879,482	157,672,015
Directorate of Food and Rural Development	-	400,000,000
Special	-	730,000,000
Capital Repayment (External Debts)	1,166,[illegible]0,00	938.250,000
Other Financial Obligation	79,000,000	174,000,000
Outstanding Liabilities	-	700,000,000
External Loans	500,000,000	1,998,000,000
Total:	5,945,964,421	6,757,751,620

Source: Nigeria Year Book, 1987, pp. 35 - 36.

The table 1.1 clearly shows the allocation to health in terms of capital expenditure with only 1.4% of the total capital expenditure for 1986 and 1.05% for 1987 while industries 5.7% and 2.8% for the same period. Considering recurrent expenditure Health had 4.2% and 1.6% as against 13.2% and 6.7% for Defence; 6.9% and 3.5% for Police and Police Affairs Department; and 5.2% and 1.3% for Cabinet Office and General Staff Headquarters for the same period.

Lack of health care services and medical care are major rural problems because rural people require a greater than average need for health care services. For instance, in Nigeria infant mortality ranges from 70:1000 in urban areas to 150:1000 in the rural areas, while maternal mortality rates are approximately 120:1000 and 214:1000 respectively (Fed. Rep. Nigeria, 1975). In spite of all these the rural areas have fewer doctors, nurses, dispensers, dentists, and other health personnel and facilities per capita than urban people. For example, in 1971 the population per medical practitioner in Nigeria was 23,000 to one and with respect to the rural areas it was about 30,000 to one (Olatunbosu, 1975).

Because the rural dwellers do not have easy access to appropriate health services in the early stages of their illness the result is often a more serious debility

and disability. This therefore adversely affects the development of human and natural resources in rural areas in general, and in the rural area of the country, including Pankshin Local Government Area (LGA) my study area. Many rural communities in Pankshin L.G.A are cut off from basic social services centres by lack of adequate roads or transport facilities especially in the raining season when most roads become impassible. In the absence of a good road network, the sick usually have to treck such long distances through this hostile environment.

Rural areas by comparison with the urban centres are poorly provided with public health and other social services such as safe water for domestic uses. Consequently water - borne or water - related diseases are the major causes of death, and undoubtedly affect the productivity of the rural inhabitants as well as causing much human suffering. UNICEF (1983) estimates that over 80% of all diseases in the world is attributable to inadequate water or sanitation. These incidences of health problems in rural areas and particularly, Pankshin L.G.A. can be attributable to the fact that the health and other health related resources are allocated mainly to sophisticated medical institutions in urban areas. The concentration of complex and costly health technology on a small segment

of the population does not even have the advantage of improving health and indeed the rural sector. To complicate matters health programmes are all too often formulated in isolation as medical care and not as an integral part of social and economic development of the community.

Rural health problems and the problems of accessibility to the health care services are extensive and their origins may be socio-cultural, economic, environmental and political. About ten years ago, at Alma-Ata WHO (1978) declared: "Health for All by the year 2000 AD". This concept implies that everybody in the world shall be free from mental, physical and social stresses. D-day is only 12 years away! But the national capital expenditure and priorities do not show any preparedness for the health for all as it is clearly demonstrated in tables 1.2 and 1.3 below.

Table 1.2

Federal Government Actual Public Capital Expenditure
1975 - 76 - 1979 - 80

Sector		₦' Million	% of Total Expend
A.Economic			
1.	Agriculture	414.846	1.84
2.	Irrigation	778.116	3.46
3.	Livestock	73.910	0.33
4.	Forestry	27.149	0.12
5.	Fishery	17.102	0.08
6.	Mining and Quarying	1,469.959	6.53
7.	Manufacturing and Craft	2,257.212	10.03
8.	Commerce and Finance	281.680	1.25
9.	Co-operative and Sup ly	156.678	0.70
10.	Power	1,551.551	6.89
11.	Transport	5,770.807	25.65
12.	Communications	1,779.112	7.91
B. Social Services			
13.	Education	1,731.564	7.69
14.	Health	269.869	1.20
15.	Information	190.708	0.85
16.	Labour	1.265	0.01
17.	Social Dev. Youths and Sports	111.934	0.50

Sector	₦' Million	% of Total Expend
C. Regional Development		
18. Water Supply	81.310	0.36
19. Sewerage, Drainage and Refuge Disposal	84.064	0.37
20. Housing	848.974	3.77
21. Town and Country Planning	163.756	0.73
D. Administration		
22. Defence and Security	2,852.406	12.68
23. General Administration	1,585.344	7.05
Ttoal;	22,499.518	100.00

Source: Fed. Rep. of Nigeria, 1981, pp. 29.

Table 1.3

Federal Government Allocation Priorities in the Third and Fourth Development Plans

Sectors		Percentages	
		Third Plan	Fourth Plan
1.	Economic Sector	61.5	57.5
	Agriculture	7.0	12.6
	Mining and Quarying	6.1	7.7
	Manufacturing	12.7	11.1
	Power	3.0	4.4
	Transportation and Communications	30.5	18.1
	Others	2.2	3.6
2.	Social Sector	11.6	17.5
	Education	7.4	11.8
	Health	2.7	4.3
	Others	1.5	2.2
3.	Environmental Development	13.9	16.2
4.	Administration	13.0	8.8
	Total:	100.0	100.0

Source: Fed. Rep. of Nigeria, 1981, p. 49.

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But the problem would anything really happen 12 years from now that would make a difference? Again who are the beneficiaries of this "health for all" package, the rural poor or the urban rich? What is contained in health for all package for the people? Is it the imported sophisticated health care system? Or will the health system embrace and improve upon the available local health resources as main priorities? Or is it the expansion of existing urban - biased medical institutions that would mean health for all by the 2000 AD? How can health facilities and services be suitably linked in a regional network? How can the geographical distribution of health resources be organised according to human need, rather than market demand? What is actually happening to the environmental conditions that pose health problems to the populace, the environment those persons cured in modern health centres will return to? Will there be genuine grassroot participation individually and collectively in the planning and implementation of the health care service delivery system?

Health for all by the year 2000 will remain an illusion if appropriate measures are not taken to redress the health situation in the rural areas where most of the population reside in Nigeria. In Pankshin L.G.A that means about 95% of its inhabitants live in

scattered farmsteads, hamlets and village settlements on the rugged terrains. This study therefore considers these conditions of health care services as some of the core problems militating against rural development, using Pankshin L.G.A of Plateau State as a test case.

1.2 Aim and Objectives of the Study

The aim of this study is to identify the major diseases and health problems, and health services delivery problems in rural areas of Pankshin L.G.A with a view of proposing more effective ways of providing rural health care services in the area.

The aim of the study will be achieved through the following specific objectives:

(i) to identify the major diseases and health problems of rural areas in Pankshin L.G.A;

(ii) to evaluate the spatial distribution of existing health care services in Pankshin in relation to rural population distribution;

(iii) to examine the role of traditional health care services in the rural communities of Pankshin L.G.A and how best these care be improved upon;

(iv) to examine the socio-cultural, economic and environmental factors of the rural communities

of the study area which affect their health habits and their attitudes towards modern medical care services; and

(v) to propose ways, for the provision of effective health care services to the rural communities in Pankshin L.G.A.

1.3 Research Hypothesis

The following hypotheses have been postulated for the purpose of this study:

(i) The major diseases and health problems are related to the environmental conditions and socio-economic characteristics of the rural communities.

(ii) There is a variation in the distribution of health institutions and personnel in Pankshin L.G.A, and as such the health care services do not effectively reach a large proportion of the population especially the rural communities.

(iii) There is a relationship between the socio-economic status of the rural communities and their accessibility to and utilization of modern medical care services.

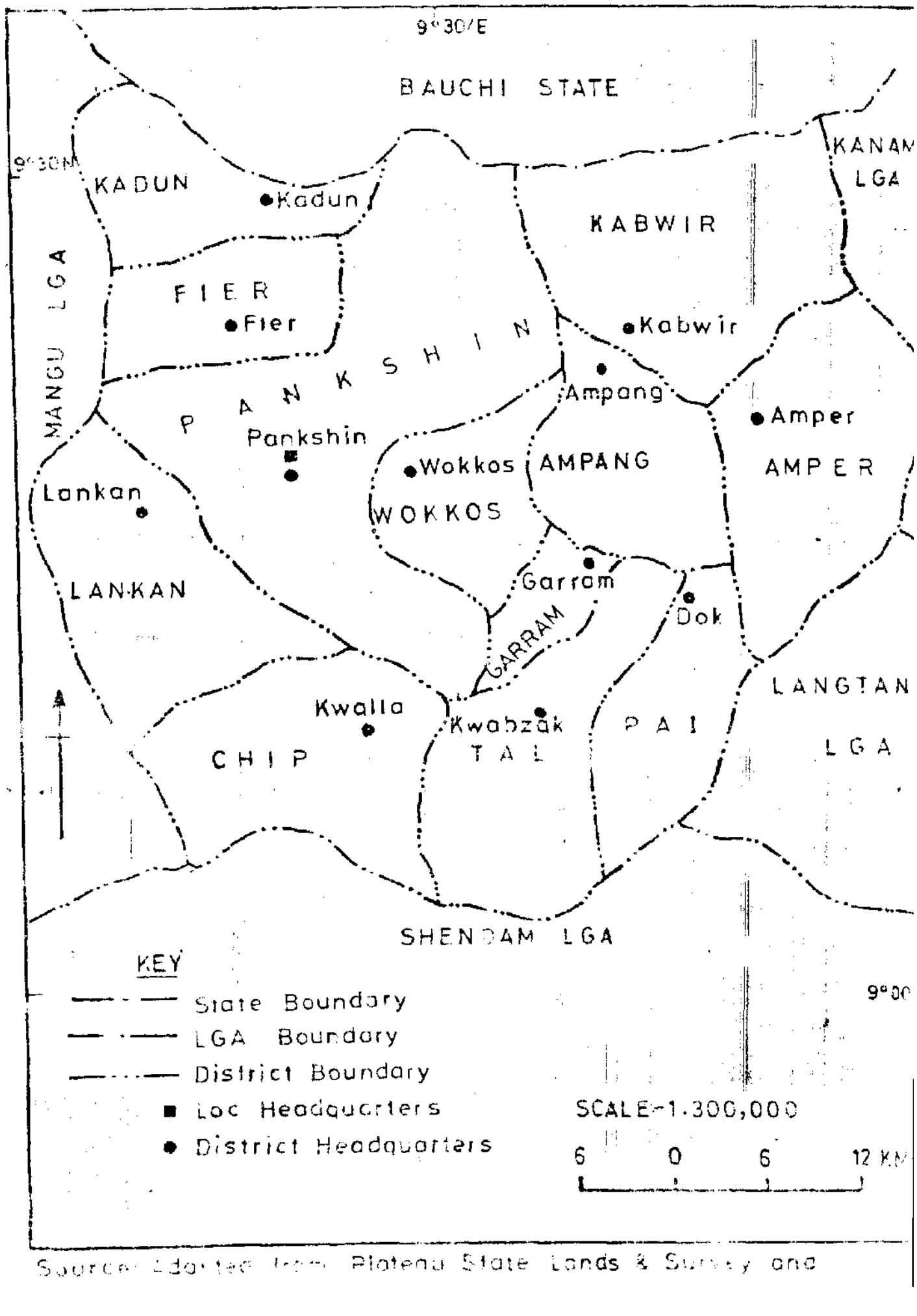
(iv) There is a relationship between the socio economic status of the people and the utilization of traditional health care services in the L.G.A.

1.4 Scope and Limitation of Study

The study covers the whole of Pankshin L.GA. which comprises twelve districts, viz, Ampang, Amper, Chip, Fier, Garram, Kabwir, Kadun, Lankan, Pai, Pankshin, Tal and Wokkos (See Fig 1.1. These districts are predominantly rural areas. It looks into the spatial distribution of health care facilities in the area, the adequacy, appropriatness and the accessibility of such facilities to the people. The study tries to identify factors which cause disease common in the rural areas. Those examined are socio-cultural, economic and environmental factors. It further assesses the impact of the existing rural health care services in terms of the rural coverage and utilization.

In fact, there are so many aspects to the study of health care services whose variables are inexhaustible and cannot all be adequately covered in a single study of this nature. It is therefore restricted to the incidence of debilitating diseases common in the area, the spatial distribution and

FIG. 1-1: PANKSHIN LGA: DISTRICTS



Source: Adapted from Plateau State Lands & Survey and

effectiveness of health care services and the people's perception of both western and traditional health services.

Because of the high rate of illiteracy with its concomitant absence of birth and death records in the study area there was the problem of age misstatement through age heaping and age shifting. However, this problem was envisaged hence the question needing information on this subject matter was designed in age group range. Problem of accessibility: Because of the dispersion of the rural settlements there was the problem of physical linkages between the villages. The major route networks are footpaths linking various villages. Sample was taken because the area was large.

It is therefore hoped that from a total sample size of 205 households from 50 sampled villages including Pankshin town in the study area, this will enable one to appreciate the problems of health care service system in the rural areas and how these problems affect rural development.

.5 Justification for Study

Personal knowledge, critical observations and involvement in the study area have motivated sufficient

justification for undertaking the research study on the rural health care service system in Pankshin L.G.A.

The importance of health care delivery as part of the social services for the improvement of the quality of life of the rural communities has been overlooked or received only lip service in many rural development programmes. The emphasis in most rural development programme has always been on agricultural productivity without any consideration on the health of the producers. The need for assessing and improving health care services as a major component of rural development or as a strategy on its own is particularly crucial because of the inherent myriad of causes of health problems in rural areas of the developing countries in general.

Pankshin L.G.A has been selected for this study as a demonstration of the ways of providing efficient and effective health care services to the rural communities. This area typical of rural areas of Nigeria is highly inaccessible because of the terrain and poor road networks with meagre medical facilities or non existing in some rural areas. The objectives and goals of rural development programme in Pankshin or any where else for that matter cannot be achieved unless the peoples health improves sufficiently enough to make them contribute significantly to the development efforts.

1.6 Research Methodology

In order to obtain the informations required for the study both primary and secondary data were collected for analysis.

1.6.1 Primary Data Sources: Primary data were collected through the administfation of questionnaires and oral interviews.

1.6.1.1 Settlement Sampling: The study area is 2334 km^2 consisting of twelve districts see table 1.4 and fig. 1.1. A sample of 1.4% of the tax payers was taken from each of the districts as shown in Table 1.4. The taxpapers are generally regarded as heads of households.

Table 1.4

Distribution of Sample in the Study Area

District	Tax Payer	Projected Population	Sample Pop
Pankshin	2544	40,784	35
Kabwir	2317	35,344	32
Amper	2049	30,504	28
Lankan	1358	19,925	18
Chip	1276	18,006	18
Fier	1113	14,659	15
Kadun	1008	11,708	14
Ampang	786	17,025	11
Tal	689	15,799	10
Pai	582	5,084	8
Wokkas	5[illegible]	9,4[illegible]	8
Garram	5[illegible]	10,26[illegible]	8
Total:	24,[illegible]	[illegible],4[illegible]	205

Source: Pankshin [illegible].C Tax Register for 1987/88 and population figures are projected from 1963 census up to 1988. Computed from the Department of Economic Planning, Statistics Division, Jos.

For; For Population projection: The use of a mathematical function for forecasting assumes that past population growth has followed some law of growth in which population is explicitly a function of time that future growth will follow a pattern predictable from this past relationship (Ward, 1971).

Thus the equation below is used for the population projection of Pankshin L.G.A to 1986.

$$Pt + n = Pt\ (1 +)^{n}$$

where Pt + n is population of the study area at any year t + n;

Pt is population of the study area at base year t;

n is number of years from base year t to the forecast year t + n; and

r is the average growth increment per unit of time.

For example, Pankshin District population in 1980 is given as 34310. Growth rate is given as 2.5% (r).

Thus 1980 - 1987 = n = 7 years; and

Pt + 1980 = Pt (1 + 0.025)7

: = 1987 = 34310 (1.025)7

= 34310 x 1.18869

= 40780.8166

= 40,784

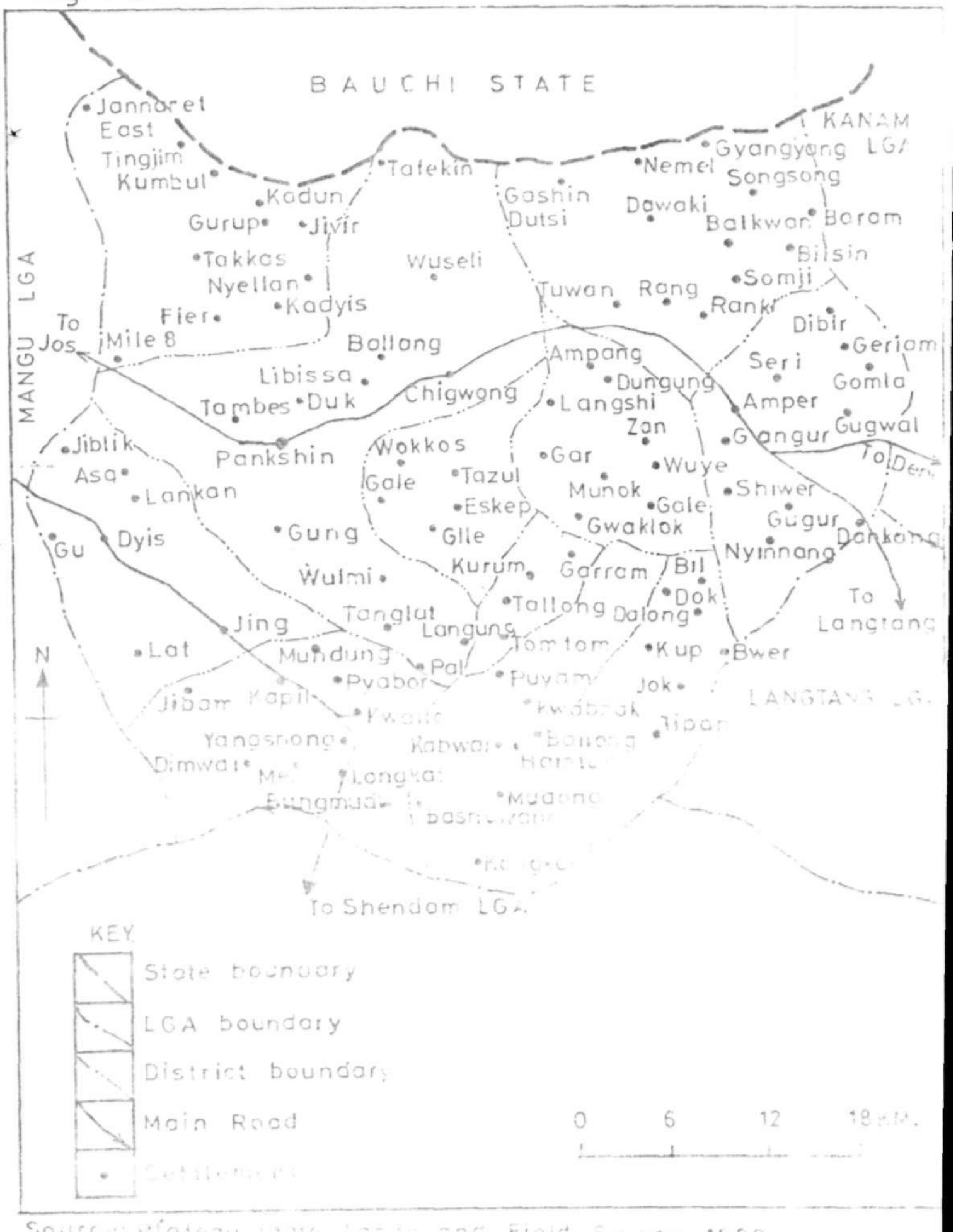
Conclusion: It therefore implies that the population of Pankshin District by the beginning of January 1988 is 40,784.

In each district a number of settlements was selected proportionately for the administration of the questionnaire. The selection of the settlements was done by arranging

the names of all of them in alphabetical order and using random numbers a sample of 50 settlements were selected. The simple random sampling was employed to ensure that every settlement in each district had the same chance of being selected. For example, Ampang District has nine main village settlements and farmsteads, thus they were arranged as Ampan, Dungun, Gale, Gar, Gwak lok, Kangshi, Munok, Wuye and Zan; and thereafter they were all numbered from 00 to 08 respectively. The following numbers were chosen from table of random numbers without replacement: 00, 01, 03, 04 and 07 representing 55.6% of the total settlements in that district. Then the settlements with these numbers and Ampang, Dungun, Gar, Gwak lok and Wuye were selected for administration of questionnaire. The same method was applied for the other districts in the study area.

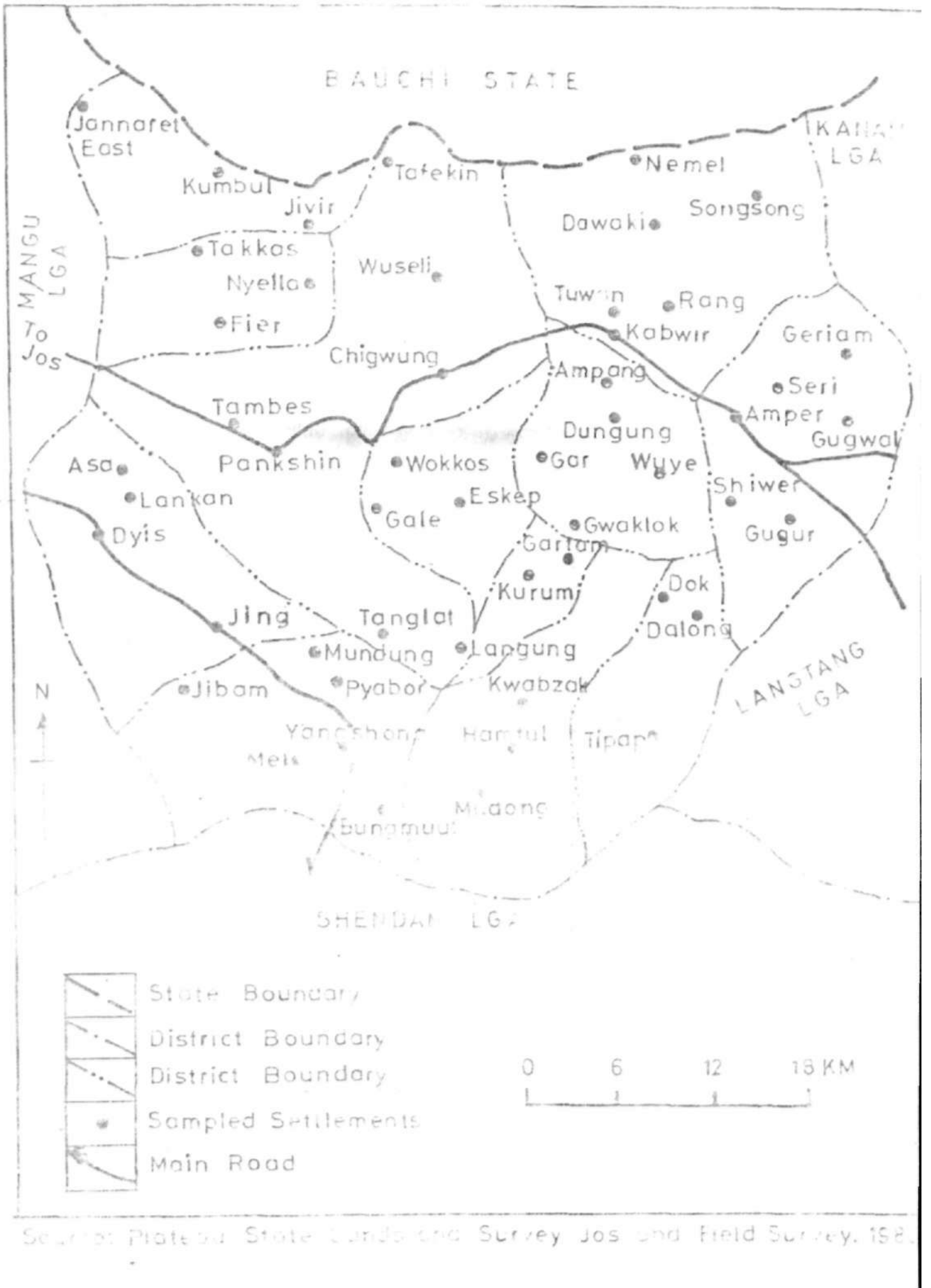
For the settlement selection, data were obtained from the tax register and from the topographical maps of Pankshin L.G.A (Fed. Surveys, Nigeria, reprinted in 1974, sheet 7; Plateau State Surveys, Dec 1980 - Plateau State L.G.As Provisional copy, and Pankshin L.G.C Land and Surveys, 1987). The sample settlements were shared among the districts as shown in Table 1.5 and Fig 1.2 and 3.

Fig. 1·2: PANKSHIN LGA. MAIN SETTLEMENTS



Source: Plateau State Lands and Field Survey, 1988

FIG. 1·3: PANKSHIN LGA SAMPLED SETTLEMENTS



Source: Plateau State Lands and Survey Jos and Field Survey, 198

Where a sampled settlement and household could not be easily traced during the administration of the questionnaire, help was sought from the village or hamlet head and school teachers and the school children about the location. Thus it was possible to trace all the sampled settlements.

Table 1.5

Distribution of Sampled Settlements Among Districts

District	No of Sampled Settlement	Total Settlement	% of Total Sampled Settlement
Kabwir	7 (53.8)	13	14.00
Amper	6 (50.0)	12	12.00
Pankshin	6 (50.0)	12	12.00
Ampang	5 (55.6)	9	10.00
Chip	5 (55.6)	9	10.00
Lankan	4 (57.1)	7	8.00
Fier	3 (60.0)	5	6.00
Kadun	3 (50.0)	6	6.00
Pai	3 (60.0)	5	6.00
Tal	3 (60.0)	5	6.00
Wokkos	3 (60.0)	5	6.00
Garram	2 (50.0)	4	4.00
Total:	50	92	100.00

1.6.1.2 Selection of Households: For the administration of questionnaire in the selected settlements, the heads of households or representatives were chosen for this purpose. The households were further selected systematically as much as possible, i.e. every third household was served with a questionnaire and interviewed. This short range of systematic sampling was as a result of the scattered nature of the settlements and the terrains.

The survey was undertaken with the help of 15 field research assistants who were mostly post-primary school teachers and were on vacation. These teachers were indigenous staff in the schools located in their respective district. These teachers help in the interpretation of the questions to the respondents in the local dialects. The respondents had more confidence in these teachers than an outsider.

1.6.1.3 Questionnaire: A set of household questionnaire was designed to generate informations on household characteristics. This set was divided into three sections. Section A: Social and Demographic survey. This was designed purposely to seek informations on the population characteristics, occupations and incomes, literacy level and settlement

location of the respondents. Section 6; was on environmental factors which was aimed at getting data on housing conditions and especially on occupancy ratio. Again the section sought information on the system of waste disposal and sources of water supply, section C was to generate information from the respondents on the accessibility, availability and utlization of the existing health care facilities.

This questionnaire contained 'closed' and 'open-ended' questions (Moser et al, 1971) which were aimed at getting the required information. During the administration of this set of questionnaire the districts, village and ward heads were informed before hand and purpose duly explained.

Another set of questionnaire was designed in the form of a proforma and administered to the health care establishments in the study area; namely hsopital, maternity clinics and dispensaries. This set was to seek information on the availability and adequacy of health care service inputs i.e personnel and facilities; and health service outputs in terms of patient/maternity attendances, admission, deliveries attended to by qualified midwives and also to identify reported cases of diseases most common in the area. This was to cover

the hospital, 18 dispensaries, six maternity clinics, five leprosy clinics and two traditional health homes all in the L.G.A.

The administration of these sets of questionnaire took place between November 1987 and the end of January, 1988.

1.6.2 Secondary Data Sources: In addition to the data collected through primary sources more information was gathered from secondary sources. These include:

(i) Records and documents from the Pankshin General Hospital, health centres and dispensaries, Ministry of Health and Epidemiological Unit, Jos, Pankshin L.G.C Health Department.

(ii) For patient - Origin Survey, patients medical cards in hospital and dispensaries were utilized to determine their origin i.e the areas they come, and most frequently recurring diseases.

(iii) For the review of available literature on the subject matter under study, books, journals, theses, newspapers, magazines, seminar papers and other relevant materials were consulted.

1.6.3 Data Analysis: To test the hypotheses and other assumptions in this study the data collected from the field survey and secondary sources were subjected to statistical and non-statistical tests. The tests used for the analysis of the data include Spearman's rank correlation coefficient, Kolmogorov - Smirnov (K - S) test Kruskal - Wallis analysis of variance (ANOVA). Other statistical techniques used are student's t - test, chi square statistic and standard deviation and coefficient of variation. The data collected were also subjected to computer SPSS analysis for cross tabulations of variables.

The non-statistical techniques used include localization coefficient, percentages, some mathematical formulae used for projections, and graphic presentations.

1.7. Definition of Terms and Concepts

This section contains certain terms and concepts which have been used in this study and it is thought appropriate to state at the outset the meaning which such terms and concepts are supposed to convey in the text.

1. Health status is the health condition good or poor of the individual, family or community.

2. Zoonosis (pl. zoonoses) is a disease in man transmitted from animals through their bites or bodily contact of the germs at abbatioir e.g rabies from the bite of a rabid dog or cat.

3. Preventive health measures are the activities directed against communicable diseases and other health problems. Such activities include provision of potable water supply, immunization, vitamin supplementation, vector control and environmental sanitation, efficient sewage system and waste disposal etc.

4. Promotive health measure is the creating of environmental conditions for change in human behaviour that can contribute positively to a good health status of the individual, family or community, through health education, change in certain habits such as easing and food preferences.

5. Curative health measures are activities which consist in the use of drugs and surgery to reduce the harmful concequences of a disease but not getting rid of the source of the disease.

6. Primary health care is an essential health care based on practical, scientifically sound and

socially acceptable methods and technology made universally accessible to individuals and families in the community through their participation and at an affordable cost.

7. Aetiological process is the causation of disease in human being.

8. Pathology is an aspect of science that deals with the cause and nature of disease.

9. Pathogen is a disease - producing agent especially living agent.

10. Onchocerciasis is the infestation of man with filarial worms (Onchocerca) which can cause river blindness.

11. Schistosomiasis is the infestation of man by blood flukes (schistosoma) from drinking, bathing or wading in infected water. There are two main types - schistosoma haematobium result in blood in urine, and schistosoma mansoni results in intestinal infestation.

12. Bronchopneumonia is the complication of small areas of the lungs which are consolidated and coalesce.

13. Bronchioletis is the inflammation of the windpipe

14. Methaemoglobinaemia is physiological disorder affecting the blood's oxygen-carrying capacity.

15. A geogen is defined by May (1961) as an environmental factor known to be connected with a disease or its pathogens.

16. Cretinism is a congenital condition of physical non-development and, usually, idiocy due to absence, of or deficient secretion from the thyroid as a result of goitre.

17. Social Area Analysis is the study of the social and demographic characteristics differentiating geographic areas in order to understand the social structure or the social environment of the areas.

18. Health manpower, the term 'human resources' has been used interchangeably with the term 'manpower'. Human resources comprise the skills, knowledge and capabilities actually or potentially available for the economic and social development of a community, whereas 'manpower' is usually restricted to persons who have acquired or are receiving education and training for specific occupations.

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Therefore the concept of health manpower generally includes the number of individuals available for, and undergoing training in the different health occupations.

19. Planning is the application of scientfic method, to policy - making or project implementation. What this means is that conscious efforts are made to increase the validity of policies in terms of the present and anticipated future of the environment or living conditions of the people.

20. Cold chain is a container (box) for storing and transporting vaccines at an appropriate temperature in order to maintain the potency of the vaccines.

The next chapter of this study discusses the literature on environmental factors that affect the health status of the rural communities in developing countries. The chapter looks at the aspects of poor health conditions on economic development in rural areas of the developing countries. It further discusses the spatial distribution of health care services in relation to the population distribution.

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Introduction

Rural health care facilities range from a periodic, dispensery with a dispenser or local traditional practitioner to a sophisticated rural cottage hospital with modern facilities and well trained staff to provide health care services to the rural people. In addition preventive health sources include regular immunization, first aid instructions, sanitation measures and other arrangement which make for maintenance of the people in a good state of health (Chitamber, 1985 and Smith, 1978). These in turn facilitate the development of human and material resources in the rural areas, and the general well-being of the rural inhabitants.

2.1 Conceptual Framework

2.1.1 Concept of Health

Some definitions of good health stress the lack of active disease processes and as a process of adaption to a social environment (Illich, 1975 and Pritchard, 1978).

it is an economically productive factor contributing to development belong to the purely academic. Effective health care contributes immensely to the development process by improving the health status of the rural communities and thereby stimulating action and - - organization in support of the process. For example as WHO (1978) briefly outlines, the control of malaria, sleeping sickness and river blindness can open new areas to settlements, but these successes have to be consolidated by maintaining the settlers' health and their potential for development especially in the rural areas. Secondly, proper nutrition and reduction of sickness increase work productivity. Thirdly breaking the vicious circle of malnutrition and infections through provision of effective health services improves the physical and mental development of the child. Fourthly, a reduction in both child and adult mortality can induce the feeling that the future is worth planning for. The process of rural development as stated can be accelerated or decelerated depending on the health status of the community and the prevelance of diseases in the region.

2.1.3 Concept of Effective Health Care Services

Health care is quite distinct from medical care. Medical care is limited to care provided by physicians

or other types of medical practitioners and takes place in hospitals, maternity clinics and dispensaries or the traditional healer's home which aimed basically at curing the sick. Comprehensive and effective health care services on the other hand, embrace not only medical care but also personal hygiene, environmental health, transportation for health services, drugs, health education of patients, nutrition, provision of potable water supply, better housing conditions, zoonotic control and the community participation.

From this perspective health care corresponds largely to a combination of promotive, preventive, curative and rehabilitative measures to be expected in a health system as defined in the global strategy for "health for all by the year 2000". This in essence, is related to the eight essential elements of primary health care as defined by the Declaration of Alma-Ata (WHO, 1978a):

> ".....education concerning prevailing health problems and the methods of preventing and controlling them, promotion of food supply and proper nutrition; an adequate supply of safe water and sanitation; maternal and child health care including family planning, immunization against the major infectious diseases; prevention and control of locally endemic diseases, appropriate treatment of common diseases and injuries; and provision of essential drugs". (p.4).

Health care service system then does not mean elaborate building of sophisticated hospitals and

clinics, and equipment alone but encompasses all sectors of any development programme. Further in the Alma - Ala declaration on health care it recommends that effective health care services should be a continuing and organized supply of care that is geographically, financially, culturally and functionally within easy reach of the whole community. This connotes that:

(i) spatially, health care facilities are accessible i.e. within reasonable distance and waiting time and the means of transportation are affordable to the people;

(ii) financially, whatever the methods of payment in use the services can be paid for by the community as a whole;

(iii) culturally, the technical and managerial methods being used are in keeping with the cultural patterns and values of the community; and

(iv) functionally, the right kind of care is available on a continuing basis to those who need it, whenever they need it, and that it is provided by the health team required for its proper delivery.

Population and spatial coverage of health care services and facilities has often been expressed in

terms of [illegible] population unit, [illegible] ration only expr[illegible] the mere exist[illegible] of services and in no way show to w[illegible] have been used by all the people in [illegible] socio-economic status, let alone co[illegible]

Health care services should indeed be physic[illegible] close to the community, on the other hand, the proj[illegible] health system must at the very least be able to pro[illegible] a full range of essential health care components. These factors will determine the minimum size of th[illegible] healthservices area. The minimum population base [illegible] ust be large enough for a self-supporting health service infrastructures. This minimum size of the health services area will of course, vary as a result of physical circumstances, population distribution, and other social, economic, political and cultural factors (Kleczkowski, et al, 1984a).

Health service centres and facilities should be [illegible]lly located in order to maintain some sort of [illegible]al equilibrium' i.e. the balance that exists bet[illegible]n the location of services and facilities in [illegible] (Morrill, 1974). This [illegible] [illegible] of the service[illegible]

and saves time for other productive undertakings. Declines in demand for health services due to time limitation or the cost of transport thus define the maximum range at which a good and effective health care service may be profitably offered. However, this range or distance will vary greatly from the close range for most constantly sought health services to the farther range for those rarely demanded i.e. primary health care services to referal health care services. But the problem with the health care system in developing countries such as Nigeria is that the most frequently demanded services and facilities are inadequate in the rural areas and poorly staffed and maintained, if at all they exist.

In a nutshell effective health care programme is that which result in a considerable reduction of health problems or improving unsatisfactory health situations. It thus measures the extent to which the set objectives and target populations have been artained and saved respectively. The strategy of an effective health care programme embraces several elements namely the provision of health services which are socially and economically relevant to the local milieu, active community participation, use of effective simple technologies, and the involvement of other development sectors like agriculture and education (UNDP, 1983).

Mahler (1986), the Director - General of WHO stresses the significance of intersectoral support in health care system in strong terms like this:

> ".....people do not think in terms of sectors. They think of food as a means of nutrition and enjoyment, of water and sanitation as necessities of life, of cleanliness and access to health care as part of the quality of life. But to ensure the availability of all of these, other sectors in addition to the health sector have to play their part" (p. 111).

In essence health should include development and should not encapsulate itself simply in the spheres of medicine. Development should therefore embrace health and not only aim at the maximization of the G.N.P. Health Planning should be included in the general socio-economic planning taking into account the duality of man, considered as a biological and as a social being. With this in view the health care process becomes meaningful to those in need of the services and further improves the health status of the rural people.

2.1.4 Health Care Structure and Components

Basically there are two systems of health care services in developing countries and in Nigeria in particular: One is traditional and the other is modern. The systems are different in terms of availability and quality of care, technology and social acceptability,

yet fundamentally both aim to serve the same population. The two systems exist side by side in Nigeria, yet remain functionally unrelated in any intentional sense (Onokerhoraye, 1984). The modern health system is organized in levels which comprises of a range of institutions which at least in theory are graded according to their degree of sophistication and specialization. Three main levels are usually classified as primary, secondary and terteary, in a hierarchical order of sophistication and specialization. But Fig. 2.1 shows an 'inverted' health care pyramid to demonstrate that primary health care is the most important and should top the hierarchy especially in developing nations.

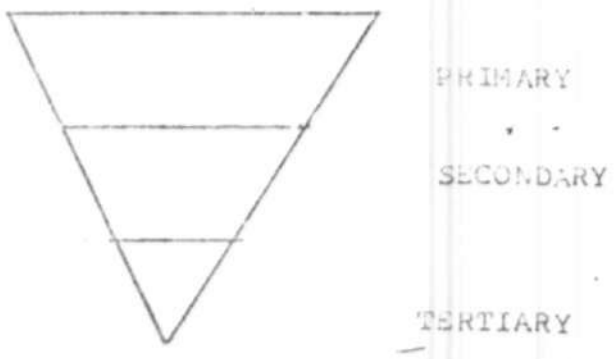


Fig. 2.1 An 'Inverted' Health Care Pyramid

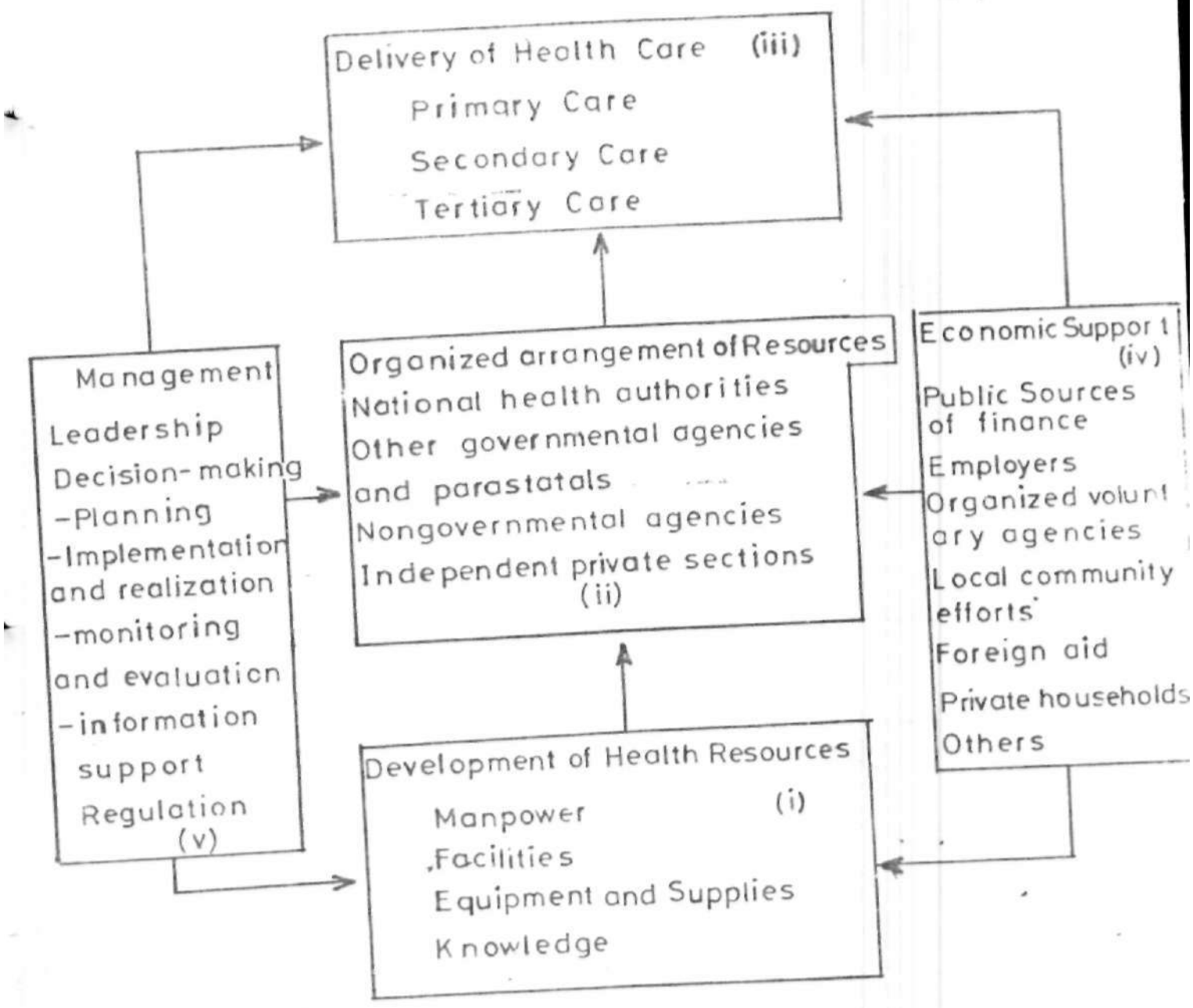
Primary health care pays particular attention to the point of initial con act between the community, individuals and families and the health services system,

Prevention, health promotion, health education, and the care of common problems should constitute the main line of action. Expensive and specialized need should be refered to secondary and tertiary levels (Cox et al, 1981, and Kleczkowski, et al. 1984b). Thus the health system has a three - tier structure of which the spatial range and population threshold rank in the order of sophistication and specialization.

It is at the local level that health care will be the most effective within the context of the area's needs and limitations. Primary health care is an integral part of the overall social and economic development of the community. It means much more than concern for the clinical treatment of the sick.

If a health system is to be reoriented to achieve a specified goal, such as health for all by the year 2000 as declared by WHO, its major infrastructural components illustrated in the model Fig. 2.2 should be properly mobilized and organized. However, the mobilization of these components in developing countries is always hampered by some serious problems arising from the interrelated issues of assessibility, selection of technologies and costs. In most cases, the extension of the geographical coverage of even minimal health

FIG. 2.2: MAJOR COMPONENT OF HEALTH SYSTEM INFRASTRUCTURES



Source: Adapted from Kleczkowski et. al. 1984 P. 15

care has been agonizingly slow. This has made access to health care services by many people outside the urban areas and low income group very difficult. To complicate matters the health systems policies are all too often being devised outside the mainstream of social and economic development policies. Consequently health care is reduced and restricted to medical care.

2.1.5. The Selection of Health Care Technologies

The organization and operation of health care services system in most developing countries such as Nigeria, have been based on the western model of health care system. The attainment of Health for All by the year 2000 as contained in the famous 1978 Alma - Ala Declaration depends largely on the success of primary health care and the accessibility of its services to the majority of the people irrespective of their geographical location and socio-economic status. It had become clear even before the declaration that health for all including those resident in socially, politically and economically disadvantaged countries, is not possible with the western world of medical care (Mohammed, 1984 and Wilenski, undated). Though it has been widely adopted, the western model appareas to be of little relevance to the conditions and goals of developing countries. Wilenski (undated) refers to the adoption of this system as a typical example of technological 'misfit'.

The selection of technology for use within the health system has commonly been based on the indiscriminate application of new methods and

sophisticated equipment and structures in an attempt to keep up to date irrespective of effectiveness and costs, and the aetiological processes within the rural setting and the country in general. This has been most disastrous for the poor developing countries in which the price of keeping a few urban hospitals up to date using sophisticated technological standards of developed countries, is the deprivation of the majority of their people living in rural areas with even the most essential health services, (Smith 1978a).

Illich (1975) observes this craze for sophistication in health system with great dismay and cries out that "the medical establishment has become a major threat to health" (p.3). His analysis on this phenomeon centres around three categories of pathology or iatrogenesis (damage caused by this medical system). Thus he calls these as 'clinical iatrogenesis' (the physical damage caused by doctors in their attempts to cure people); 'social iatrogenesis' (the addiction of people to medical care as a solution to all their problems); and structural iatrogenesis' (the destruction of the patients' autonomy along with the expropriation of his/her responsibility for individual health care).

He further criticizes modern medicine that the impact of medicine constitutes one of the most rapidly expanding epidemics of our time.

It was and is still envisaged that highly qualified personnel working within sophisticated health services would progressively expand resources peripherally until the entire population was/is covered. This'top - down' approach has not happened. In fact the services still remain predominantly curative and oriented mostly towards a small segment of the population at the top. Thus, the majority of the populations in the rural sector are without access to these services.

Lee (1981) views this inequality critically as the by-product of the rise of professionalization which is the impact of the penetraction of western model. He categorically says that:

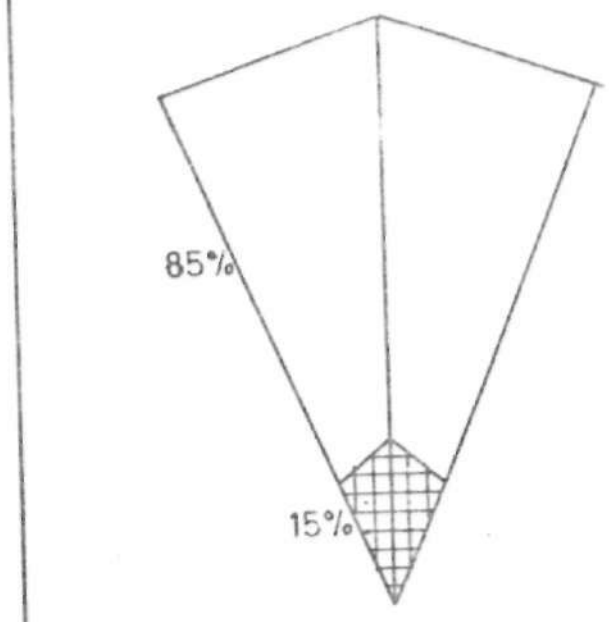
> "This creates an immense gulf between 'technocrats' and the poor, and the definition of needs in important areas like health and education is monopolized by this tiny coterie. Basic needs become those which only highly trained professionals can satisfy. ..... Thus research on diseases that affect the poor receive(s) low priority, as do alternative systems of providing health care and education" (p. 115).

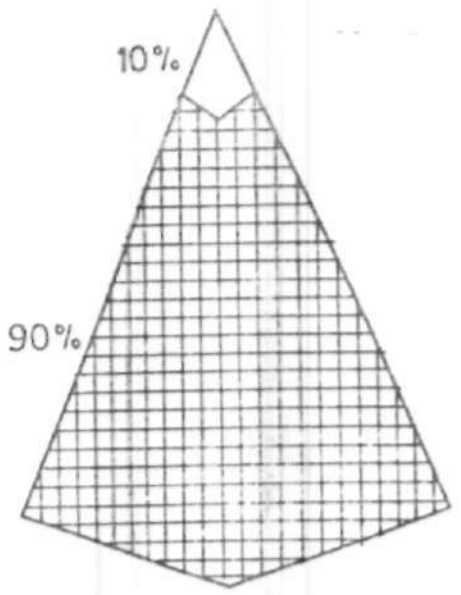
Consequently, Walsh (1978b) argues that a part of the problem that has resulted in the inadequate health service coverage at the village level of the developing countries stems from an excessive concern with the training of western - style medical manpower rather than with the delivery of appropriate health services.

Closely linked with highly complex and sophisticated technology and manpower is the rising costs of health care services and maintenance which further restricts the socio-spatial coverage only to the areas with efficient transport network where only a small fraction of the population is found, those at upper socio-economic apex. At the moment, the World Health Organization (UNICEF, 1985) estimates that approximately three-quarters of all health spending in the developing countries is being used to provide relatively expensive medical care for a relatively small minority in the towns and cities. Over half of the national health budget in Senegal, Nigeria, Ghana and philipines, for example, is spent on urban hospitals (UNICEF, 1985). This situation is illustrated in Fig. 2.3.

The continued reliance on the western model of medical care in developing countries is largely a

FIG. 2-3: HEALTH EXPENDITURE & POP. SERVED





Where the money is spent (as % of the national health budget)	How many people are served (as % of population)

▦ Primary Health Care ☐ Hospital Care

Source: Adapted from UNICEF, 1985 : 57

legacy of the colonial policy of economic development in the satellite countries. Doyal (1979) observes this system of economic development and clearly posit that:

> ".....Capitalist production is itself a cause of illhealth in a variety of ways. In sofar as curative medicine appears to deny or at least minimize the need for such preventive measures, it serves to protect existing economic interest. Curative medicine has provided the basis for an expanding and extremely profitable health care industry - the medical industrial complexes in the U.S.A., Britain, and other developed countries. Traditional healers gradually became less important with the development of capitalism" (p.36).

This system has lured the developing countries into over expenditures on curative measures rather than primary preventive measures. Table 2.1 further illustrates this situation in the developing nations. It would be more logical if preventive services had more allocation of resources than others in fulfilment of the old adage that 'Prevention is better than cure". If preventive measures and essential medical services are adequately taken care of then health services would be said to have reached the doorstep of the rural poor.

Table 2.1

Composition of the Health Sector in Developing Countries

Services	% of total Expenditure on Health
(a) Curative care	70 - 87
(i) Personal services (care of patients) by health facilities and indepent providers.	
(ii) Purchases of medicins	
(b) Preventive Services (Secondary) Patient related.	10 - 20
(i) Maternal and Child Health Clinics, at health facilities.	
(ii) Community Health Programmes	
(c) Preventive Services; Others (Primary)	3 - 10
(i) Diseases control programmes	
(ii) Sanitation	
(iii) Education and promotion of health and hygiene	
(iv) Control of endemic and zoonotic diseases.	
(v) Monitoring disease patterns	
Total:	100

Source: WHO [illegible], 1985, p. 27

2.1.6. Concept of Traditional Health Care Services

Mention was made above of traditional medicine as one of the basic health systems operating in developing countries, Nigeria inclusive. Over a long period of existence of mankind traditional medicine or traditional community health care has created the resources and procedures appropriate to local conditions and culture. Whatever its stage of development each community has made great use of traditional system in an attempt to solve their health problems.

Sofowora (1982) defines traditional medicine as:

> "The total combination of knowledge and practice, whether explicable or not, used in diagnosing, preventing, or eliminating a physical, mental or social disease and which may rely exclusively on past experience and observation handed down from generation to generation, verbally or in writing. A traditional medical practitioner is a person who is recognized by the community in which he lives as competent to provide health care by using vegetable, animal, and mineral substances and certain other methods" (p. 2).

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These produres are usually based on social, cultural and religious backgrounds as well as on the knowledge, attitutdes, and beliefs, that prevail in the community re arding physical, mental, and social well-being and the causes of diseases and

disability (Nwuba, [illegible], Sofoworo, 1983 and Ezenwa, 1988).

The incorporation of lay healers, and particularly lay midwives into national health systems would prove very useful in the rural areas. Traditional medicine provides the only source of medical care owing to the scarcity and low accessibility of modern medical services (Onokerhoraye, 1984).

2.1.7. Health Problems in Rural Areas

Many factors that affect the health of the rural communities in developing countries are so intricate that make it difficult to isolate the contribution of any one. In very broad terms three principal groups of factors are discernible in the distribution of health and ill-health. These are summarized as environmental (physical) biological and human factors (Bash, 1976 and Egunjobi, 1986).

2.1.7.1. Environmental Factors

The study of localities in relation to disease and health was well established by the time of Hippocrates in about the 5th Century B.C. In the text titled, Airs, Waters, Places, he states:

> "Whoever, wishes to pursue properly the science of medicine must proceed thus: first, he ought to consider what effects each season of the year can produce; for the seasons are not all alike, but differ widely both in themselves

> ... at their crises. The next point is the h t winds and the cold, especially those that are peculiar to each particular region ..... . For with the seasons men's diseases, like their digestive organs suffer change" (in Bašch, 1978 p. 4).

Hippocrates was here identifying a relationship between disease and the environment of man, and drawing the logical conclusion that improvement, in human health needs an understanding and modification of the factors that favour disease occurrence.

2.1.7.1.1 Climatic Conditions

The tropical and sub-tropical climate and other microclimatic elements of the developing countries help to produce a myriad of diseases which afflict the rural populations most who are in direct contact with the pathological agents in the process of their socio-economic activities. Insects that transmit parasites such as malaria (mosquitos), Onchocerca (simulium fly) and trypanosoma (tsetse-fly) breed well in warm moist climates in these regions.

In addition to insect - borne diseases, the tropical and sub-tropical condition favour the breeding of snails the vectors of schistosomiasis because of the flush vegetation in rivers, ponds, streams and irrigation canals. Schistosomiasis primarily strikes

the rural poor and so little has been done except China (Wei, 1973,. Sidel and Sidel, 1975; Eckholm, 1978; Bruijning, 1980; and Wilenski; Undated) and Puerto Rico (Eckholm, ibid) to halt its spread, to develop effective cures or even to document its prevalence.

Studies carried out differently by Eckholm (1978), Scott (1979) and Hardiman and Midgley (1982) estimated that about 250 million people are afflicted by the disease in at least 72, countries, and the number is ever increasing each year. This figure will become very alarming with the proliferation of dams for hydroelectric power and irrigation schemes in rural areas of the developing countries if control measures are not provided in such projects.

The seasonality of the climatic conditions of the tropical and sub-tropical world has some worsening effects on the health conditions of the rural population. Chambers (1982)has this to say on the effect of the seasonality of climate and health:

> "A wet season follows a dry season; towards the end of the dry season, food becomes more scarce; anticipating hardwork, some mothers stop breast feeding, when the rains come, adults get very busy with urgent agricultural activities,

> where mothers cultivate, weed or transplant, they are occupied much of the day and have less time and energy for washing, cleaning, child care, food preparation and cooking. Small children are left behind in the village, looked after by elder siblings or very old people or not at all" (p. 45).

In this hungry season the available food is less nutritious and more often contaminated by hot humid conditions.

Hut leak or collapse under heavy rains and life can be wet, cold, dirty and miserable. Fuelwood becomes scarce and so wet for food preparation and the consequent outcome is the mass emission of smoke during food preparation and room heating. Again smoke in itself constitutes a health hazard causing bronchiolitis and bronchopneumonia (Sefoluwe, 1985).

Travel in the rainy season becomes more and more difficult and unpleasant. Only a smaller proportion of the sick go for treatment during the rains. Procurement of drugs from central stores becomes more difficult and the lack of money for travel and treatment all conspire to depress clinic attendance figure (Chambers, 1982).

1.7.1.2 Geological Substrate

The soil is important to human health primarily because of its local make up; affecting man directly

through water both drinking and cooking, and less directly by way of the vegetable food and other plants that may grow in it.

The most important element for human health that is frequently absent from soils is iodine, a deficiency of which may lead to endemic goitre, or endemic cretinism inflicting about 10% of the world's population (Giggs, 1977 and Basch, 1978). Goitre is usually prevalent in remote areas where there is poverty, poor sanitation, bad water or water from wells and springs which originate from limestone; and in mountainous areas of Africa especially the Cameroon mountains and some parts of Nigeria (Oke and Ojo-Aleitimi, 1984).

The segment of the population at risk in a community is the female aged 10 - 19 years (Bennett, 1985a and Ogomudia, 1987). Ogomudia (ibid) shows his concern about this sex selectivity when he says:

> "I note with deep interest the research findings that showed the prevalence of endemic goitre common amongst female than males in Plateau State and its correlation with stream water".

However, endemic goitre, as a health problem apart from its grotesqueness on the victim, has been associated with feeble - mindedness, lowered educational ability

and Gast - Gastech Ltd, 1977, and Oke and Oloreiri, 1984). To eradicate goitre, in these areas is to encourage the use of iodised salt.

Another probable association of geologic substrate with disease is anaemia owing to iron deficiency which is mostly due to factors other than an iron - poor soil (Basch, 1978).

2.1.7.1.3 Hydrological Factors

Whilst water is essentially important to support life it can nevertheless provide a wide range of health hazards. Many pathogens responsible for diseases are essentially water - borne as shown in Table 2.2.

Table 2.2

Diseases Associated with Water Pathogens

Pathogen	Diseases
Algae	Gastroenteritis
Bacteria	Cholera, dysentery, paratyphoid, typhoid.
Parasites	Malaria, tapeworm, yellow fever, roundworm, schistosomiasis, geulnea worm.
Protozoa	Dysentery
Viruses	Infectious hepatitis, poliomyelitis

Source: Howe, 1977, p.6.

According to Miller (1983), WHO estimates that 80% of all disease in the world are attributable to inadequate water or sanitation. This includes the effects of drinking contaminated water, water acting as a breeding ground for the carriers of diseases and disease caused by lack of washing.

In the developing countries, particularly in rural areas where a great majority of the people live probably not more than 10% of the population have access to pipe - borne water (UNICEF, 1983). This segment of the population depends on unhygienic sources as shallow wells, ponds, streams, brooks, springs or rainfall. Because water is hard to come by families have to store available water in containers for long periods of time. These containers then form conducive habitat for the breeding of mosquitos which transmit diseases to the inhabitants.

The inadequacy of water supply, let alone potable water, for domestic purpose further exacerbates the personal hygiene problems in the rural areas. The disparity in water supply between urban and rural sectors in Nigeria is estimated by Ayotade and Oyebande (1978) to put out of 27.4% of the total population served with potable water only 0.13% of the total rural population had access to potable water supply.

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and breeding [illegible] for mosquito and snails that transmit malaria and schistosomiasis respectively.

Vegetation has been an important environmental factor in determining the distribution of the tse-tse fly which transmit the pathogens causing trypanosomiasis in animals and sleeping sickness in man. In Nigeria, this goes to explain why the incidence of these diseases is low in the open savannah regions while it is very high in the areas of forests and woodlands (Adejuwon, 1978).

2.1.7.1.5 Environmentally Induced Health Hazards in Rural Areas

The growing use of chemical fertilizers and herbicides in the developing countries on the farm does not only upset the balance of soil ecosystems, but causes another more localised and hazardous problem - the chemical pollution of sources drinking water in the rural areas. Nitrates and phosphates applied on farms normally find their way into streams, rivers and brooks, the major sources of water supply in rural areas, through surface run-offs or perculation. Excessive consumption of nitrates in drinking water can cause methaemoglobinaemia (Brown, 1978 and Sofoluwe, 1980). The safe limit of nitrate concentration is [illegible], set by the [illegible] is 20 [illegible] (Adejuwon, [illegible]).

High [illegible] of these salts in the sources of water supply can apparently trigger off sudden blooms of algae and other aquatic plants that favour the [illegible] of disease carriers in the water.

Apart from the pollution of water by chemical fertilizers and herbicides, industrial effluents have found their way into rivers the source of water supply for the rural inhabitants. Aguiyi - Ironisi (1988) reported the case of Paka Village, some 16km from Kaduna where the rural folk do not buy soap because they use the sudsy water, industrial wastes discharged there by the textile industries. Recently industrial toxic wastes have been 'imported' and dumped in Koko village in Bendel state, the immeidate victims, of course, are these villagers.

Although man - made lakes are to serve for the improvement of the well being of man, lacking proper control measures, these reservoirs above dams have become simulium, mosquito and fresh - water snails breeding grounds (World Bank, 1975). Thus the development of water resources lacking proper control measures may help spread the incidence of Onchocerciasis, Malaria and schistosomiasis.

2.1.7.2. Socio-Economic and Cultural Factors

It is the poverty of developing countries, with its accompaniments of rapidly expanding populations, inadequate nutrition, and crowded and unsanitary living conditions that lie at the root of the health problems (World Bank, 1975). In essence the socio-economic variables and cultural beliefs and practices of society influence the health status of that community either positively or negatively.

2.1.7.2.1 Demographic Factors

A number of health risks derive from high fertility rates in developing countries. When large numbers of people live in poor households located in unsanitary surroundings, communicable diseases spread easily and rapidly. The result effects are high mortality and morbidity rates, especially in the case of children. World Bank (1975) shows that high mortality rates, in turn, induce families to have many children so that they can assure themselves of surviving progeny. High fertility rates imply high parity - condition of a woman with regard to the number of children

she has [illegible] high parity directly affects maternal mortality, a sharp and stead increase in risks of death occurring after the third birth (World Bank, 1975 and Bauch, 1978).

Demographic factors may influence health at the community level as well as the family level (World Bank, 1974). Population pressure on land may lead to evercropping, soil degradation (Mabogunje, 1970 and 1975; Boserup, 1975; and Sikhibis, 1975) and consequently poor nutrition. It may force people to migrate, with the resulting emotional and physical health problems of social disorganization.

2.1.7.2.2 Relationship Between Socio-Economic Factors and Health Status

At any given time, the poor may be less healthy than others for several reasons: they are less able to pay for necessary medical care, and with limited education they are unaware of good health practices or unable to use the medical care system effectively. The relationship between low socio-economic status and poor health is often seen as a vicious circle that is difficult to break. This is particularly true where one observes poor and sick people and asks: Are they poor because they are sick or sick because they are poor? The effects of poor health on income however, are pervasive in the rural areas in [illegible] countries.

Luft (1978) argues that many people who would otherwise not be poor are poor simply because they are sick, but relatively few people who would otherwise be healthy are sick simply because they are poor. This argument raises another doubt on the policy system of the entire economy as to whether the policy is to produce a type of elitist health care system or the problem lies with those who control the factors of production system. Low incom, low education, unstable occupations and low-status jobs held by the rural poor and their poor housing conditions, absence of savings, little and/or poor material possessions and lack of social security, do have an important causal role in health problems of the rural areas.

Some scholars like Myrdal (1957), Luft (1978), Meier (1984) and Omololu (1987) recognize the inherent problems of the vicious circle of income and health, while others tend to ignore the causal circular relationship and concentrate on only one aspect, generally the effects of poverty on health status.

Omololu (1987) clearly demonstrates that the vicious circle implies that the poor are poor and remain poor because they are poor. In essence it shows that there is a circular process of forces

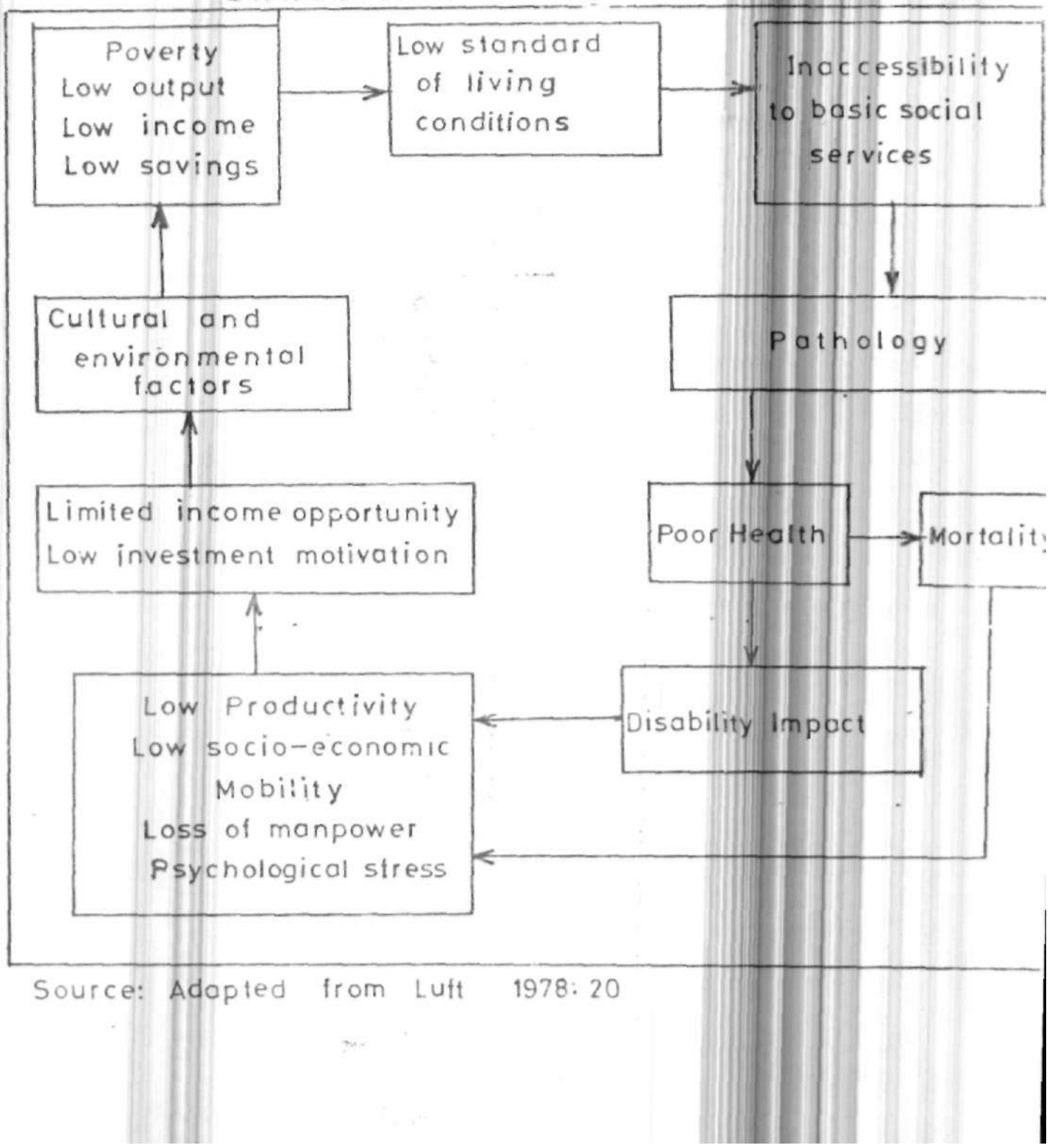
which act as a deterrent to limit the upward mobility chances of the poor and thus keep him in a state of poverty and thus reduce his access to basic health facilities. This situation persists through time and transmits its effects from one generation to another.

There is some evidence to the circular pattern of the relationship between poverty and health. For example, the poor who become ill, work less and earn a little income, and therefore become more severely ill, and so forth to acute conditions. Because of poverty the poor are underfed, hence they become undernourished and undernourishment inhibits hardwork thereby keeping agricultural output low hence they become undernourished again, and more susceptible to diseases. Fig. 2.4 tries to demonstrate this circular causation.

Malnutrition further lowers the body's resistance to various diseases and reduces its recuperative power. Pedro (1971) posits that:

> "Malnutrition not only may lower resistance to disease, but it may actually cause malfunction of the body that have little to do with viruses and bacteria"(P. 13).

FIG. 2·4: CONCEPTUAL FRAME WORK OF HEALTH STATUS AND SOCIO-ECONOMIC FACTORS



Source: Adapted from Luft 1978: 20

...e cumulative circular causation model (Myrdal, 1957) thus appears as a very useful and relevant concept in analyzing the circular relationship between health status and poverty. At times overcrowding, unpleasant working conditions, the absence of any reasonable sanitation system and restricted access to basic social services almost certainly lead to much higher illness rates among the poor than among the rich.

2.1.7.2.3 Cultural Factors in Rural Health Problems

Every rural community has its beliefs and practices. Some cultural barriers prevent the inhabitants from recognizing health problems and to seek care for them. Cultural patterns also provides a wide range of favourable conditions that play a role in human diseases. May (1958) has observed that culture influences disease occurrence and distribution in certain ways by linking or separating challenges of the environment overtime through economic activities.

Harrison (1978) in a study on child bearing in Zaria has identified culture and beliefs as part of the factors that affect the utlization of maternity and medical services by the Hausa women, and states:

. . . .

> "The remoteness of their homes is only one reason for the delay in seeking medical help, but there are other more important reasons why many girls put up with prolonged labour in the end develop fistulae or even die. Some admit they have little confidence in the maternity services. Others find the hospital environment disturbing where valued traditions are not necessarily followed. For example, in A.B.U, Zaria, women are made to lie on their backs during labour while at their homes, the kneeling

position is preferred. For this and other cultural reasons, many women are prepared to spend several days in labour without seeking expert medical help" (p.20).

Associated with culture and beliefs, Harrison (1978) and Lister (1986) have found the 'gishiri' cut' practices (i.e the cutting of the vagina, intended to accelerate dilatation of the cervix) in these communities (Hausa) a health hazaird which has very lasting adverse effects on the victims.

Benneth and others (1972) have found among the Kiganda of Uganda, the general traditional concepts held in regards to the causation of diarrhoea to be the 'Obusobe' i.e. diarrhoea is a sanction against the omission of certain ceremonies required to appeasse the gods when extramarital acts are committed. Similarly, Messing (1972) has found in Ethiopia that the causation of diseases is usually attributed to non-scientific phenomena, including the action of evil spirits. These have to be exorcised or require negotiation through a skilled medium. Hence there is little concern if the people upstream pollute the water that is being consumed downstream.

Elsewhere in India traditionally orthodox Hindus believe that the proper place for waste

is not in the home where it defiles but outside where low - caste sweepers can remove it, and in this way a cultural concern with purity contributes to public illhealth (Hardiman and Midgley, 1982). There are many examples that abound in other rural communities the world over, like failure to give colostrum i.e. the first bread milk, in some parts of Pakistan, severe food restriction and purgatives in treatment of diarrhoea in some parts of Latin America, female circumcision (incision) in Sudan, and forbiding the feeding of fish to young children because it is believed to cause worms in Malaysia (Jelliffe, 1985), and Peru and Indonesia (Besch, 1978). Ball (1977) reports the belief in the developed countries that:

> "Neither is the Western World free of such myths, since for many years the belief was held in Europe that childhood measles was the effect of the mother's failure to menstrate during pregnancy and that the rash was due to the appearance of the retained 'bad blood'" (p. 248).

Eggs are linked with illness (India, Lebanon, Syria); mental retardation (East Africa); late Speech development (Korea), and licentiousness (various countries). In Togo and elsewhere in West Africa eggs are kept from children on the grounds

that they will come to expect luxuries and grow up to be thieves (Basch, 1978). In a similar vein, Basch (op cit) has further shown how purification of water is rejected by Mexican villagers because water, as the creative source of life was considered sacred; natural water therefore cannot be bad, and tampering with it is viewed as sacrilege, while Peruvian villagers considered boiled water as suitable only for sickly people and not as a health measure to rid it of water - borne diseases.

The consequences of the traditional set of concepts and beliefs are important in that if they were held exclusively by a family. Then there would be no measures taken to stop the spread of any disease since it is not considered communicable.

.7.2.4 Population Mobility and Health Problems

Migration is the geographical mobility of persons between areas, generally involving a change of residence over a specific period of time (Kosinski and Prothero, 1970). Population mobility here includes rural - rural movement to where farmland is abundant, transhumance by the nomadic pastoralists, seasonal movement of people to work in other areas and resettlement of displaced people affected by occurrence of natural hazards, resource development or undesirability

of the settlement in the existing area.

Naturally it is a clear phenomenan that disease, both epidemic and endemic, does not recognize political boundaries or does not pause at the artificial frontiers. Population mobility in all its various form constitutes a serious problem in public health by increasing the spread of disease and by obstructing control measures (Bruce - Chwatt, 1972 and Pyle, 1979). For instance, malaria is highly endemic and pandemic in Tropical Africa and other tropical and sub-tropical parts of the world, with exception of some highlands, but large - scale downhill movement of the non immune population of the highlands are easily infected in the lowlands and serious outbreak of malaria, schistosomiasis or sleeping sickness may occur (Bruce - Chwatt, 1972, Prothero, 1972a and 1972b, and Pyle, 1979).

Similarly, a situation may occur when infected immigrants invade areas where malaria and other diseases have been eradicated or non-existing. These unorganized exoduses and resettlement schemes as a result of dam or otherwise have some major implications on the rural health and health care planning. These people move with cultural, social and economic background.

2.1.7.5 Modernization and Rural Health Problems

While culture, tribes, religion and other beliefs, and socio-economic status determine the food habits and good hygiene of various communities (Oke and Opfeitioy 1984; and Chikwem and Omotara, 1986) the penetration of modern good into the rural sector has its part to play on their health status. Mabogunje (1980) defines modernization as:

> "The process of social changes, and.... breeds its own needs and desires in those exposed to it" (p.39).

He further explains that modernization stimulates appetite for the consumption of certain 'modern' goods and services and therefore creates considerable dissatisfaction with traditional conditions especially in the rural areas. In essence, modernization has created in the rural population the taste for goods imported into the country or prepared in the urban centres such as bread, cakes and sweets. Some of these items are purchased and taken to the rural areas must have been contaminated especially fungal contamination in case of bread and cakes (Oke and Ojoreitimi, 1984). Chikwem and Omotara (1986) have suggested that the sources of food

contamination are the street vendors, time of exposure to open air before consumption and transportation process.

However, the most susceptible group of rural inhabitants are the infants and their susceptibility has been further increased by the introduction of infant good formulas. Most mothers in rural areas in Nigeria and other developing countries are not only illitrate but also too poor to purchase recommended quantity. They understand little or nothing about sterilization but feel compelled to use baby food formulas since it affords them more time to work on the farms and/or in the local markets without inter interuption. Baby foods are therefore prepared in improperly cleaned bottles and left for consumption for periods of up to eight or so hours. The consequence is a proliferation in the incidence of infantile diarrhoea in the rural areas (Helsing, 1975, and Chikwem and, Omotara, 1986). The baby formula provides the infant with only about 85% of the nutritional value of the mother's with if the former is prepared correctly, and it lacks the protective factors passively transmitted from mother to child (Basch, 1978).

The quest for markets by the baby food manufacturers have driven the product into places where they should

not have been sold. The penetration of such products into the poverty - riddden rural areas has been ranging from general advertisements in the mass media to various ways of even distributing free samples to mothers to start on the new feeding method (Helsing, 1975). The result of teaching the people that breast feeding and their staple are somehow inferior is what Derrick Jelliffe has called 'commerciogenic malnutrition'. If an already undernourished person can be made to want junk foods (soft drinks, chewing gum, sweets, ice cream, with little or no nutritional value), this is not the companies problem.

Jelliffe and Jeff Jelliffe quoted extensively in Doyal (1979) have described commerciogenic malnutrition in some detail:

> "All major infant food firms especially the large international concerns have continually carried out advertising and promotional campaigns in competition with each other in less developed countries since world war two. Without any doubt whatsoever they have been one of the major factors responsible for the present decline in breast feeding in areas where bottle feeding is neither economically nor hygienically feasible. They have therefore also been responsible in considerable measure for the present rise in such regions in the prevalence of marasmus and diarrhoeal disease in infants, resulting in high mortality, costly and prolonged treatment and considerable risk, permanent brain damage" (p.128).

Gedrie (1977) and Boyd (1972) have given the consequence of malnutrition as the stunting of physical growth in young children, which is virtually impossible to compensate for later, even under the best conditions because the baby has not got sufficient calories and proteins during final intra - uterine weeks and his first month on earth. They further state that the effects are then carried on to succeeding generations since mothers themselves stunted by childhood malnutrition and deprived of adequate food during pregnancy tend to give birth to premature and/or underweight babies, and the risk of both infant and maternal mortality is further increased.

2.1.8. Health Problems and Rural Development Process

From an economist's viewpoint, "human disease does not fit readily into the balance sheet of the development economist, yet but its impact in the tropics is enormous" (Scott, 1970: 22).

Disease has been one of the greatest forces militating against agricultural development and modernization in the tropical and sub tropical parts of the globe. A wide range of organisms forms the basis of health problems, and this in turn influences the beliefs and attitudes of the people, especially those in the rural areas. The schistosomes, blackflies,

anopheles mosquitoes, snails, tse-tse-flies, worms and many others have constituted complex systems of tropical diseases, and have made themselves felt in every aspect of tropical life and society - such impact could be economically, socially or politically felt.

2.1.8.1 Loss of Millions of Fertile Hectares of Farmland

Perhaps the most obvious negative impact of disease infestation on expanding the world's food production cap city-is the abandonemt of millions of hectares of potentially rich lands. Scott (1979) has estimated that almost 320 million hectares of arable land lie uncultivated and agricultural development in some areas needs proper control of the diseases present. There are instances that large - scale projects have been jeopardized by direase prevalence. For example in 1950, at the Gezira Development Project in Sudan, Malaria swept in and killed hundreds of people. Consequently one-third of the rice, millet, wheat, groundnuts and cotton that were being grown in the massive project went unharvested due to the illness of the work force.

In Nigeria, World Bank (1975) reports that about 30 million hectares are currently under

populated and under farmed due to human and animal trypanosomiasis. Tse-tse fly control could mean more food through agricultural development.

2.1.8.2 Reducing Availability of Labour Force

Both premature death and absenteeism due to illness reduce the availablity of labour. Absenteeism usually dirupts the production process which results in loss of output. A careful study carried out in the Republic of Korea showed that an optimal disease programme resulting in increased work life and decreased absenteeism would yield a return of $15(for each dollar spent (World Bank 1975). World Bank, further gives additional example of disease control programmes that have substantially reduced absenteeism to include anti malaria programmes in the Philippines and Southern Africa, and yaws control programmes in Haiti.

When laid low by disease, the subsistence farmer changes from a producer to consumer or a complete consumer who is supported by the toil of others.

2.1.8.3 Impairing Productivity of Labour

Ill health affects the productivity of peasant farmers since strength, stamina and ability to

concentrate suffer. Ability to learn is impaired by sickness and malnutrition, and absences from school because of disease may reduce cognitive achievement as discussed earlier.

2.1.8.4 Burning More Energy

The principal goal of agricultural development is to provide enough food to fight malnutrition and undernutrition. But the tropical diseases waste food in several ways. Unsanitary environment commonly leads to a disease called tropical malabsorption i.e the failure of the human intestine to absorbe fat, starch and protein. The food passes through the diseased individual without depositing the energy that it should in the body of a healthy person (Scott, 1979).

Herbert Pollack in his study of 'Disease as a Factor in the World Food Problem' (in Scott, op cit) shows how body metabolism is increased by infections and fevers. These cause the body to burn more energy, i.e. use more food power. More calories are used by an inactive, unproductive sick person than by a healthy person. Pollack Calculated that about 7,500 tons of rice per month per million sick people are wasted through the excess food demands of the diseased.

2.1.8.5. A Low Value on Life

Fatalism and the placing of a low value on life are not surprising responses to the general misery of poverty and sickness. Thus disease leads to pessimism and a reluctance among the poor of developing countries to 'Take the long views" and invest in the future (Roggers and Burdge, 1972 and Scott, 1979).

Promulgation of innovation is not easy in such an atmosphere. If the population does not approach development with an optimistic attitude they will not apply full effort, and development will necessarily occur at a slower rate, if at all.

2.1.9 The Role of Good Health in the Development Process

The cost of illhealth has at least three aspects: losses from unrealized production and expenses for alleviation of the condition. The third cost is of pain and suffering of the diseased invidual which is difficult to quantify (Basch, 1970).

2.1.9.1 Health as an Investment

For quite some time health has been viewed as a 'consumption' expenditure rather than 'productive' investment as discussed earlier.

On the other hand economists in the people's Republic of China maintain on the converse, that illhealth results in economic costs to society.

Smith and Powell (1978) have shown some studies conducted in some countries to illustrate health as an investment. For example, a Colombian study estimated that 5% of the total number of days of work annually are lost for health reasons. A World Bank study (1975) among Indonesian workers reported that 85% of the studied population had hookworm and 45% suffered from Iron - deficiency anaemia. Sixty days of treatment with iron supplement increased productivity by 19% at a cost of US $013 per person in this study.

The economic benefits derived from the improved health services are (i) reduction of working days lost to illness, (ii) improved productivity due to improvement in the health of the labour force, (iii) savings of time previously spent in travelling and waiting for treatment, thus yielding more time available for production, and (iv) a decrease in mortality rate resulting in increased longevity in the labour force (Smith and Powell, 1978; and Meaier 1984).

In short, the removal of the threat of disease and death brings the possibility of a brighter

future, from the short view to long view of life, from pessimism to optimism and from fatalism to realism. This attitutde change helps the rural communities embrace development projects whole heartedly and more likely to accept innovations. Reductions in adult mortality would not only add years to income - generating lives and reduce dependency ratios, but increase the 'yeild' on education and other investment community makes in workers during their formative years (Meier, 1984). Better health is one way human being achieve more positive control of their environment and in turn increases their desire and ability to plan their future.

2.1.9.2 Health and Political Stability

A superficial look at history, it shows that some successful developing societies have used health as an instrument of stability as well as development. When extensive health services are provided, the population appreciates the interest in them shown by their government, they become aware that their government cares about them. Often a government's initial contact with its people is through a health programme. For example, the Russian Empire used health to strengthen stability

and development in the 19th century when 'zemstvos' (the local district assemblies) promoted the use of 'feldshers' to provide health services for the peasants (Smith and Powell, of cit). Other countries that used health for this purpose are many - China, Tanzania and Cuba.

2.1.9.3 The Advantages of Traditional Health Practice in Rural Development

The fact that over 70% of the developing world's poor do not have access to modern sophisticated medical services does not mean that they have nowhere and no one to turn to when they need help. It is against the background of inaccessibility to modern health services, socio-economic status of the rural poor, the severity of their health problem that any advantages of traditional medicine can be sought as indicated below.

2.1.9.3.1 Cost

Traditional medicine is cheaper than modern one. The cost of the latter is increased by modern health technology which in many cases is inappropriate and irrelevant to the immediate needs of people in rural areas. It is generally accepted that the cost of this type of medical programme which relies heavily on institutions and professional staff is increasing faster than that of simpler

health programmes such as the traditional system, available in Asia and China (Sofowora, 1982).

Recently there has been a marked increase in the number of pharmaceutical products marketed but with no proportionate improvement in health (Gunaratne, 1980). Sofowora (1982) reports the situation of drug bill for many countries still represent a large proportion of their total health expenditure, especially in developing countries. While drugs account for 10 - 30% of the total cost of health care in developed countries, these figures rise to 30 - 50% in developing countries. These countries have to purchase such drugs at exorbitant and often inflated cost from multinational companies which spend a disproportionately large amount on advertising in developing countries to encourage them to spend even more on modern drugs. For example, in Bagladesh drugs alone account for about 63.8% of the total health cost, Nepal 44.3%, Thailand 30.5%. Burma 24.5% and India 18.8% (Sofowora, 1982).

2.1.9.3.2 Accessibility

Traditional health care service is more accessible to most of the population in the developing

countries. This is as a result of a shortage of hospitals and health centres as well as medical personnel needed to man modern health care delivery system.

For example, Gish (1975), and Chagular and Tarimo (1975) report that in 1973 mainland Tanzania had 128 hospitals with 18,700 beds or only one hospital bed per 720 persons. There were about 105 rural health centres; 1500 rural dispensaries, and some 1500 health post, at village level. Niger is another place where inaccessibility to modern health care is acute due to a shortage of personnel Fournier and Djermakoye (1975) report that in rural areas of Niger, only one medical officer is available, for every 170,000 persons, and one nurse or auxiliary for 9430 persons. The services of rural dispensaries only reach people living a 10 - 15km radius serving less than 15% of the patients in the Department of Maradi, while the remaining 85% or more seek for medical help for their own health problems from traditional medical practitioners. Arole and Arole (1975) report similar experiences by the rural inhabitants of Jamkhed, India.

2.1.9.3.3. Acceptability

Tne traditional medicine enjoys a wider acceptability among the rural people than does the modern medicine. This could be due to partly to the inaccessibility of modern medicine, but the major contributory factor is the fact that traditional medicine mixes readily into the socio-cultural milieu of the people in whose culture it is deeply rooted (Twumasi and others, 1975, and Sofowora, 1982). It was the only form of health care available before the penetration of modern medicine.

For example, Behrhorst (1975); reports the situation in a large town of Amerindia population in Guatemala where three types of medical services co-exist - a health centre staffed by non-Indian nurses and medical students; a local traditional medical practitioners (Curandero) and two community health promoters (Amerindians trained to operate almost like barefoot doctors). The majority of local people where interviewed where they meant when they were sick, said the preferred to be attended either the 'curandero' or the health promoters.

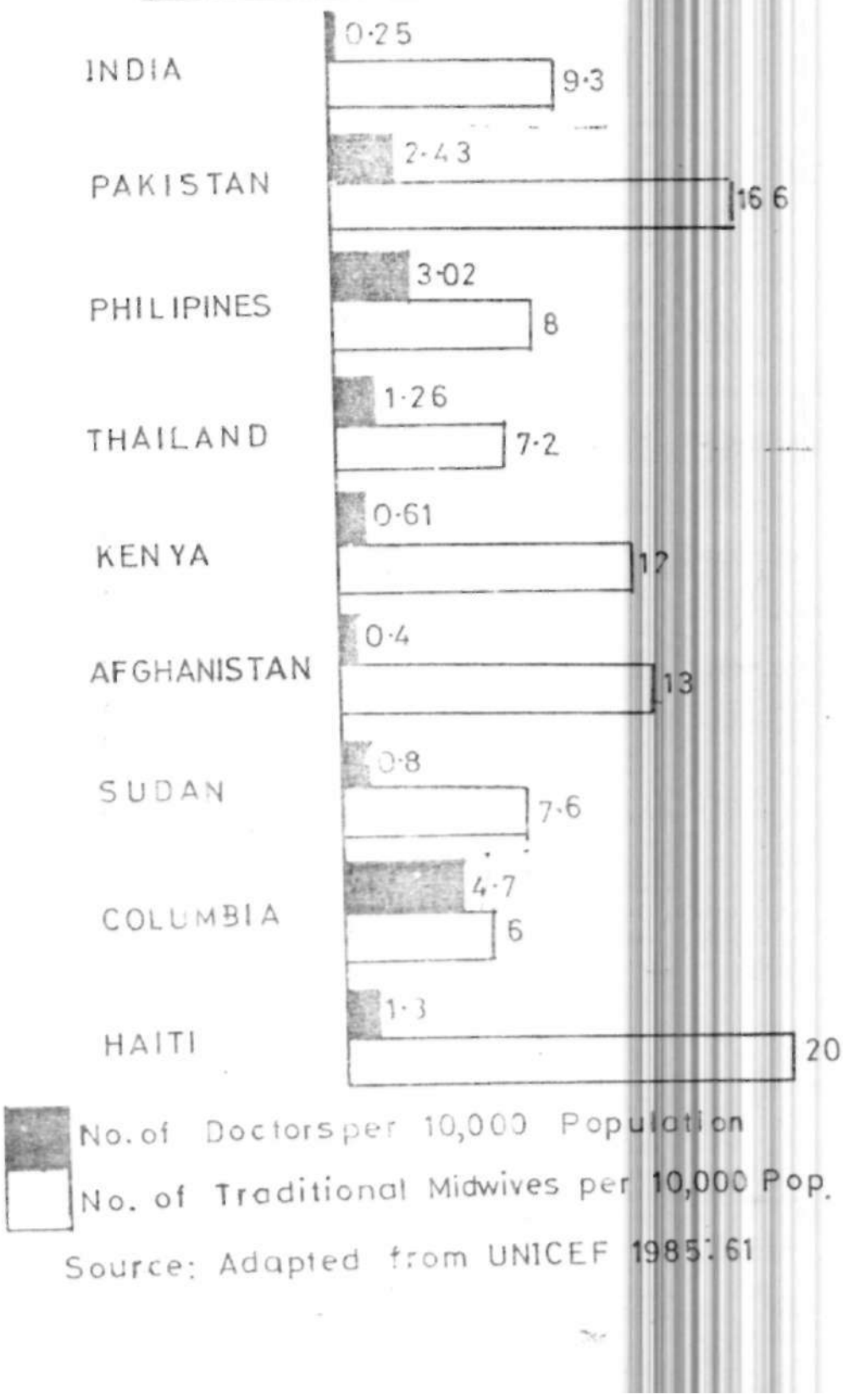
Behrhoust further observes that the reason why non-professionals are preferred to professionals is principally cultural.

2.1.9.3.4 Supplementary Health Manpower

The traditional practitioners could serve as additional sources of health manpower especially in the rural areas. This is particularly so where a developing country is trying to achieve total health coverage for its people. For a great majority of mothers in the developing countries, it is the local midwife or traditional birth attendants who is the most important source of support in pregnancy, child birth and early child care. The traditional birth attendants are known with various names in their respective locations.

In India, for example, an estimated 300,000 'dais' attend 40% of all birth; Thailand 17,000 'mon tam yae' attend 80% of all births; Nicaragua, the 'parteras' deliver 66% of all babies. Over 90% of the 38,00 'nilote' in the Philippines live in the rural areas; Haiti almost all the 11,000 'sages-femmes' live in the countryside, Egypt, 10,000 'deyas' serve mainly the rural and urban poor; and in Indonesia, The 70,000 to 80,000 'dukun bayis' attend over 90% of births to poor mothers (UNICEF, 1985).

FIG. 2·5. AVAILABILITY OF DOCTORS AND TRADITIONAL MIDWIVES IN SOME DEVELOPING COUNTRIES



Source: Adapted from UNICEF 1985: 61

Between 60% and 80% of all mother in the developing world turn to traditional medicines for help with the process of bearing and carring for children. Unlike modern health practitioners, traditional midwives are concentrated among the poor and in the rural areas (See Fig. 2.6).

Despite the important role played in the health care service delivery system, the traditional medicine has been besieged by criticisms which range from its being unhygienic in the mode of preparing the medicine to being cryptic in practice. The traditional medicine lacks scientific proof in its efficacy and precision in diagnosing health problems. Witch-craft and the evil aspect of traditional medicine also discredit this form of practice (Sofowra op cit).

2.1.9.4 Integration of Traditional and Modern Medicine

Perhaps the greatest gain to be achieved in integrating traditional and orthodox systems of a developing country is that the increase in manpower would help to provide total health coverage for all (WHO 1978b). Below are some case studies of the incorporation of both systems.

2.1.9.4.1 India: Ayurvedic Medicine

Ayurvedic is reputed to have practised for over 3000 years but was discontinued with the

pur[illegible]ion of the western model of medical [illegible]
[illegible]ent followed British rule in India. As with [illegible]
[illegible]tional medical service in its formative [illegible]
the training and servies provided were [illegible]
essentially for the expatriate ruling [illegible]
which had very narrow spatial coverage.

However in 1920 the India National Congress passed a resolution to the effect that having regard to the widely prevalent and generally accepted utility of the AyurVedic and Unani systems of medicine in India, earnest efforts should be made by the people of India to popularize school, colleges and hospitals for instructions and treatment in accordance with these indigenous systems (Udupa, 1975). Udupa further reports demonstrates that there are at present about 50,000 institutionally qualified Ayurvedic practitioners and about 150,000 non-institutionally qualified registered practitioners of Indian medicine. Again it is estimated that there are another 200,000 traditional Ayurvedic practititioners in the rural areas who are neither qualified from any institution nor registered. These practititioners receive practical in-services training from their preception (Udupa 1975). Ayurvedic drugs are generally preferred by people living in rural areas, [illegible] the

practition[illegible] local residents and remain very close to them socially and culturally, and further gain their confidence in spite of all the modern advance in medicine.

The state and central governments support about 9,000 Ayurvedic dispensaries and 195 hospitals. Traditionally trained Ayurvedic physicians used to meet the primary health needs of the rural people at a very low cost, since their medicines are cheaply prepared fro the herbs readily available in the fields and local markets.

India has integrated the modern medicine course with Ayurvedic medicine course. Nearly 100 Ayurvedic colleges have been established. Coursesin both modern and Ayurvedic medicine have been offered in universities even up to postgraduate training leading to Ph.D degreee since 1966 (Udapa, 1975).

2.1.9.4.2 The Chinese Model of Health Services Delivery

In a number of significant ways the model of the health system being developed in China thus differs either qualitatively or quantitatively from the model used by industrialized countries. Milenski (undated) gives the districtive features of the Chinese systems as:

"(a) the stress on the link between health and medical care delivery system on the one hand, and production and economic development on the other;

(b) the use of resources to deal with the common diseases of the majority of the people living in the countryside rather than on the treatment of, and research into the diseases of the urban elite;

(c) the stress on prevention;

(d) the use of labour - intensive methods, including the "mass line" and intermediate technology to achieve these goals;

(e) the removal of the control of health care from medical professionals, the use of traditional practitioners to develop and expand the health system; and the training of new types of health workers with skills to match specific tasks;

(f) the special social orientation given to students, teachers and specialists practitioners in all programmes of training" (pp. 13 - 14).

Since 1952, campaigns have continued to concentrate on sanitary practices, elimination of . . . the four pests, and of the major parasitic diseases (in particular schistosomiasis, ancylostomiasis, filariasis, Kala azar and malaria) though at different times and different places (Sidel and Sidel, 1975, Horn, 1987, and Wilenski, op cit.) As part of the campaign, additional traditional doctors were trained. New schools of traditional medicine were opened. In 1958, 3200 college students in colleges and 52,000 apprentices were undergoing training (Wilsenski

op cit). The training was far less expensive than that of the western - style model and required far cheaper equipment and fewer imported drugs. Medical herbs were locally grown which cut down the expenses on imported drugs.

The Chinese Rural Health Network: Prior to Great Leap Forward in 1958, individual medical practice was still largely on a private fee for service and concentrated in the larger country towns, hence most villagers still had no immediate access to medical care.

During the Great Leap Forward in 1958 an attempt was made to change this approach. As the basic social, political and economic units of the countryside, the commune was also to be responsible for the medical care of its members. The commune was to train health workers for the production brigades below it, bear the medical expenses of its members and establish a communal hospital.

The barefoot doctors usually work in health stations at the production brigade level. They are selected by their fellow peasants for training. In the rural areas midwives trained for short periods (6 months) provide antenatal and postnatal care

services, and perform simple deliveries (Sidel and Sidel, 1975:).

In 1965, a radical redirection of policies was initiated by Mao's statement of 26 June 1965 in which he set out his objections to the current policies:

> "Tell the Ministry of Public Health that it only works for 15% of the entire population. Furthermore, this 15% is made up mostly of the privileged. The local ranks of the peasants cannot obtain medical treatment and also do not receive medicine. The Public Health Ministry is not a people's ministry. It should be called the Urban Public Health Ministry or, the Public Health Ministry of the privileged even, the Urban Public Health Ministry of the privileged ....."
> (Mao, 1965).

This radical approach taken to make health care services appropriate and accessible to all people at relatively cheap rate is what Smith (1979) describes as:

> ".....the stress on the rural areas, decentralization, deprofessionalization and demystification of medical practice, and mass participation in the provision of health care and preventive measures" (p.208).

The Chinese have employed principles particularly suited to the historical, cultural, geographical, and political conditions of the society.

It is [illegible] to solution to the health problems of the developing nations is a fully integrated type of training that includes the essential principles of both the indigenous system of medicine and the principles of modern medical sciences so that practitioners can serve the rural population with efficiency and understanding and at relatively low cost. Health care system needs proper coordination with other national development programmes, such as education, agriculture, and potable water supply.

2.2 Literature Review

2.2.1 The Spatial Distribution of Health Infrastructures in Developing World

Health infrastructure development and health personnel availability in developing countries vary among regions and between rural and urban areas within countries. The following therefore demonstrates by regions the current status of physical resources in the health sector in terms of both quantity and geographic distribution.

1 Africa

Access to health facilities in rural areas of African countries is highly inadequate. On the average, ratios of population to hospital beds are 15 to 20 times those in developed countries (WHO 1979). Moreover, these few facilities often

cover wide geographic areas and large numbers of people. Inadequate transportation systems and cost of transport and lodging further limit actual rural coverage (Meier 1984). Meier further illustrates that in Kenya, for example, 40% of the outpatients coming to rural health centres lived within 8kms, 30% lived 8 to 16 km away; and 30% lived more than 16km away.

The distribution of facilities is urban biased. For example in Borno state, Nigeria where 80% of the population lives in villages only 50% of health clinics are in rural areas. There are only 233 persons per dispensary in the semi urban areas surrounding Lagos, whereas in outlying, rural states there are between 25,000 and 60,000 persons per dispensary (Meier, ibid).

Broadly speaking, Africa has a severe shortage of medical personnel which varies between 10,000 and 85,000 persons per physician as compared with between 300 and 850 persons per physician in developed countries (calculated from Hardiman, et . al, 1982). This is below the WHO; standard of 1:10,000 for developing countries. Again the plight of the rural areas is further aggravated by the maldistribution of these few medical personnel with over whelming majority of physicians practising

in the urban centres. In Segenal, for instance, 76% of the nation's physicians are concentrated in the capital area, Dakar where only 17% of the population lives (Meier, op cit). On the average. Africa has only one nurse/midwife to 4148 persons as against 215 persons in the developed countries (calculated from Hardiman, et.al, op.cit and far below the WHO's standard of 1:1,000 for developing world. Such shortages impede expansion of health care systems to currently underserved and rural populations.

.2 South Asia

South Asia has more abundant health manpower than Africa but a similar lack of facilities exists. This region has averages of 3,000 to 4,000 persons per hospital bed. Health centres and clinics or sub centres in rural areas are often understaffed and so do not adequately serve their catchment areas which often exceed 100,000 persons each. In India only 58 of rural health centres operate with full staff complement (Meier, ibid), luckily the Ayurvedic practitioners readily complement in this areas.

3 South east Asia and Pacific

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The health facilities in this region are relatively well developed, particularly at the hospital level.

Ratios of population per hospital bed for Thailand, the Philippines and Papua New Guinea and among the lowest in the developing countries outside of Latin America. This region has averages of population/ hospital bed between 170:1 and 1560:1; population/ physician 2020:1 and 18,160:1; and population per nurse/midwife between 1050:1 and 4730:1 (Adapted from Meier, ibid).

Massive programmes of expansion of rural health centres have been undertaken recently by the countries in this part of the world.

4 Latin America

Latin America has the most developed and best distributed health infrastructure of any given region of the developing countries. Ratios of population to infrastructure often compare favourably to those of developed countries. The population per health worker fell from 500 to about 360 from 1970 to 1976. The population per physician from 1800 in 1964 to 1,300 in 1976 (Meier, ibid). However, the urban-rural disparity is noticeable with two-thirds of physicians located in larger cities where only one-third of the population resides.

5 Middle East

Health infrastructure in the Middle East generally is poorly distributed. In Syria, for example, 45% of the health clinics are located in Damascus and Aleppo. In Jordan, 71% of the hospital beds are located in Amman which has 57% of the population.

On the contrary Egypt has developed well-distributed rural system with sufficient number of rural health units to ensure that there is a health care facility within 3km of every village.

Shortages and maldistribution of some categories of health personnel characterize Middle East countries. Cultural and religious traditions require that women be attended only by females, yet all countries in the region have a critical shortage of female personnel. Since this problem is in part a result of the lack of women with the prerequisite educational levels, many of the countries in the region have turned to training traditional midwives to ensure access to services for women and children (Meier, 1984).

From all these regions it is observed that there have been problems of effective health care service delivery to meet the basic health needs of

the majority and a complete coverage of the entire human race by the year 2000.

2.2.2. Problems of Health Care Services Delivery in Developing Countries

An excellent summary of the place of health care delivery in the infrastructure of a national health system is in the Declaration of Alma-Ata (WHO, 1978)

> Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community .... addresses the main health problems in the community providing promotive, preventive, curative and rehabitative services accordingly (p 3-4).

In essence, from the WHO's declaration quoted in part above and the discussion in section 2.8, there have been gaps in the provision of effective health care services in the developing world.

2.2.2.1 Problems in the Development of Health Resources

In all national health systems, there are substantial problems involving the development of human and physical resources. Most developing countries suffer serious shortages of health personnel in relation to health needs. There are also qualitative problems since many health professionals, particularly, physicians, have been educated according to doctrines formulated in affluent industrialized countries and not in accordance with the population's health needs in their own countries (Kleczkowski, et al, 1984a) a system vehemently rejected by Mao Tse-tung in 1965.

2.2.2.2 Problems in the Organization of Health Resources

For many historical, and political reasons, the organization of health resources in countries has not been efficient in the sense of achieving maximum benefits from the available resources. The organization of health care are often fashioned to serve certain population groups. The social and geographical deployment of resources tends to favour individual and families of higher socio-economic status to the detriment of poor population in both urban and rural sectors (Kleczkowski, et al, op cit).

2.2.2.3 Problems in Health Care Delivery

As a result of the insufficient and fragmented organization of resources, the delivery of health care services faces a lot of setbacks in many countries. These arise from the use of technology that is inappropriate to the needs of the communities in various socio-economic settings. Problems arise also from a lack of adjustment of delivery patterns to human needs. Personnel may be insensitive to patients' feelings and the circumstances of care, for example, patients may have to wait for hours under uncomfortable conditions.

The continuity of a patient's treatment over a period of time, when different personnel may be involved in the same case, depends on good medical records: these are often lacking, and as a result, health care continity is poor (McGlashan, 1972 and Kleczowski, et al, 1984a).

2.2.2.4. Problems in Health System Management

In the developing countries this generally means excessive centralization of decision-making with weak administrative capacity at the local level. Furthermore, decision-making processes that require

substantial analysis and judgement at a central level are often weak through lack of political initiative, shortage of experienced management staff and deficient information (Kleczkowski, et al, 1984a).

In some health systems, where responsibilities have been delegated peripherally, the necessary supervision from higher levels is lacking. Vertical relationships are usually inadequately organized. The occurrence of top down policy-making without sufficient clarification at lower levels, weakens the position at those levels, and this problem is often aggravated on account of the bypassing of pheripheral and intermediate levels and duplication of lines of command. In most instances horizontal liaisons between the health sector and other relevant sectors seldom function well or, in some cases are missing completely.

Poor health management may be as a result of weak monitoring and evaluation, or irrelevant supply of information that is oriented towards health management, and lack of clear delineation of goals (WHO, 1981).

2.2.3. Pragmatic Approach to Rural health Care Service Delivery

(1) Cuba

The years prior to 1959, most of the population especially those living in the rural areas did not have ready access to health services of any kind. The state health services were inadequate and inefficiently organized and hardly covered the major cities, private pharmacists, traditional healers and quacks provided services in the rural areas and in small towns. Traditional birth attendants dealt with deliveries (Arnaldo, 1975). Private services were in general of better quality than the government ones, but they were expensive and a sizeable part of the population could not afford them. Besides, no effective control was exercised over them.

In Cuba, presently health is considered as one of the fundamental human rights and health care services are free for everyone. Although there are still some differences between the various provinces, a permanent objective is to achieve an equal distribution of services. Arnaldo (1975) report that from 1959, physicians began to volunteer to work for a time in the mountains, where no doctor had ever practised. When rural hospitals were being built,

the doctors settled where they could; farmers offered parts of their homes.

Since the revolution by 1966, health services have covered practically the entire population. The utilization of these services also approaches 100%. The number of hospital beds grew from 28,500 in 1958 to 41,000 in 1973 (Arnaldo, op cit). The planned 56 new rural hospitals have been completed and each staffed fully with a team of physicians, dentists, nurses, and other health personnel (Arnaldo, 1975; Flahault, et al, 1986; and Smith, 1979).

There has been a major shift of emphasis from curative to preventive medicine. The training of medical personnel now places great stress on the basic needs of rural areas in such fields as hygiene and epidemiology.

(2) Tanzania

Tanzania is committed to providing health care for everyone. In 1973 the total population was shared among the urban and rural sectors as about 7% and 93% respectively (Chagula and Tarimo, 1975; Gish, 1975 and Olatunbosun 1978).

The major health problems that cause morbidity and mortality in Tanzania are infectious and parasitic diseases, and more particularly pronounced in the rural areas. In Tanzania, not only have the basic health service centres been inadequate to meet the needs of the people but they have also tended to be urban biased because the missionary health centres were initially located in urban centres.

The above trends therefore make it obvious that a change in approach was absolutely necessary for equitable distribution of health care services to be achieved. Most significantly, the 1967 Arusha Declaration which made it categorically clear that top priority be given to the provision of health services, education and water supply for the rural population (Gish 1975) with more emphasis on disease prevention (Chagula and Tarimo op cit). In pursuit of this social and economic policy Nyerere at the Arusha Declaration unequivocally proclaimed that:

> We must not forget that people who live in towns can possibly become the exploiters of those who live in the rural areas. All our big hospitals are in towns and they benefit only a small section of the people of Tanzania, it is the overseas sale of the peasants' produce which provides exchange for repayment. Those who do not get the benefit of the hospitals thus carry the major

> responsibility for paying for them. Tarmac roads, too, are mostly found in towns and are of especial value to the motor-car owners.... (Nyerere, 1968: 242-3)

The rural health centre has been conceived as the nucleus of local coverage, where reasonably well qualified health workers using elementary facilities would support surrounding dispensaries as well as being points from which national health campaigns might be launched and sustained. The rural health personnel were expected to provide simple outpatient care and visits to homes, schools and communal centres; comprehensive maternal and child welfare services; education of all kinds, particularly in environmental hygiene; and to participate in campaigns conducted against specific diseases (Chagula and Tarimo 1975: and Gish, 1975).

To achieve these noble objectives, Tanzania's policy was to mobilize rural population into Ujamaa villages which has two principal objectives: the first is to make it easier for the government to provide the people with facilities such as adequate and wholesome water, education and basic health services; the second is to raise productivity so that the villages can more effectively combat the vicious circle of poverty, ignorance and disease (Aziz, 1978,

Chagula and Tarimo, 1975, Hyden, 1980 and Lele, 1975). Tanzania's primary emphasis on provision of rural health services and social transformation has been on massive training of appropriate health service manpower for the rural areas, establishment of new and expansion of existing health centres and services and promotion of mobile health services. The more important health workers trained in Tanzania are the village medical helpers, maternal and child health aides, health auxiliaries, rural medical aides, medical assistants, assistant medical officers and doctors (Chagula and Tarimo 1975).

In summary, the Ujamaa has brought about a reduction in regional disparities of access to basic infrastructural services especial rural health care, water supply and education, as shown below in Table 2.3.

Table 2.3

Provision of Social Services in Tanzania

	Year	Pop. per Rural n Health Cen.	Access to Rural water Supply	Illiter- acy	Enrol- ment Rate Pri. Ed.
National	1970	187,901	13%	67.7%	37.7%
Level	1975	98,650	25%	38.7%	54.4%
Coefficient of Regional	1970	0.58	0.53	-	0.22
Variations	1975	0.30	0.25	0.26	0.23

Source: Ghai, et al, 1979, p. 252

2.2.4. The Existing Spatial Pattern of Health Care Services and Facilities in Nigeria

One major feature of health care services and facilities, like other social services provided from a fixed point, is that they should be located so that people living in various localities can have physical as well as socio-economic access to them. If the available facilities are not evenly distributed in relation to the population distribution then many people could be deprived of health care services and facilities. This section therefore, tries to highlight the distribution of existing health care facilities in Nigeria.

2.2.4.1 The Distribution of Health Facilities Among States

A very careful observation of the structure of health care facilities, like other social services, in the then nineteen states of Nigeria shows significant disparities among the states in terms of the availability of these facilities; Table 2.5 shows the distribution of hospitals among the then nineteen states in 1979 and demonstrates this variation.

However, from the table, if the 538 hospitals which were in the country in 1979 were to be equitably distributed among the states according to the population, it implies then that each of them should have one hospital to 153,571 people (Onokerhoraye, 1984). Table 2.5 clearly demonstrates the overconcentration of hospitals in some states at the expense of others. For example, Bendel state has 62.4% and Anambra, 54.4% above the national average population per hospital while on the contrary, Borno, Gongola, Kano, Niger and Sokoto have 106.3%, 109.1%, 247.7% 130.1% and 524.6% respectively below the national average population per hospital.

Table 2.4

Distribution of Hospitals and Hospital Beds by States in Nigeria, 1979

State	No. of Hosp.	Popu. per Hospital	% Deviation from National Average	No of Hosp. Bed	Popu. per Hosp. Bed	% Deviation from National Average
Anambra	76	70,013	+54.4	5382	989	+34.7
Bauchi	12	299,742	-95.2	1220	2948	-94.7
Bendel	63	57,790	+62.4	4786	761	+49.7
Benue	15	239,373	-55.9	1124	3194	-111.0
Borno	14	316,757	-106.3	1389	3193	-110.9
Cross River	3?	160,803	- 4.7	2649	1943	-28.3
Gongola	12	321,191	-109.4	1636	2356	-55.6
Imo	64	84,898	+ 44.7	4415	1231	+18.7
Kaduna	27	224,563	- 46.2	3244	1869	-23.4
Kano	16	533,969	-247.7	1426	5991	-295.7
Kwara	22	115,295	+24.9	1804	1406	+ 7.1
Lagos	29	82,634	+46.2	10,240	234	+84.5
Niger	5	353,440	-130.1	747	2366	- 56.3
Ogun	22	104,300	+ 32.1	2,288	1002	+ 33.8
Ondo	24	168,367	- 9.6	2,479	1629	- 7.6
Oyo	58	132,866	+ 13.5	5,642	1365	+ 9.8
Plateau	15	199,886	-30.2	1447	2072	-36.9
Rivers	25	101,780	+ 33.7	1684	1511	+ 0.2
Sokoto	7	959,257	-524.6	979	6859	-353.0
Nigeria	538	153,257		54,581	1514	

Source: Calculated from Onokerhoraye, 1984, p. 123.

Another pattern of disparity in the distribution of health care facilities is reflected in the structure of hospital beds per population of each state. The mean number of people per hospital bed in the country in 1979 was 1514. Similarly Table 2.4 clearly shows the overconcentration of hospital beds in some states at the expense of others.

The maldistribution of hospital structures among states is also reflected in the distribution of doctors. The doctor/population ration in Nigeria is one of the lowest in the world. The geographic distribution of the few doctors leaves a great deal to be desired. Table 2.5 shows that the doctor/population ratio is the country was 1:22228 in 1979, quite below the WHO's standard for developing countries of / 1: 10,000. The table demonstrates that some states had lower figures than the national average, such as Sokoto with 208.3%; Niger, 148.4%; Kano, 140.2%; and Bauchi, 134.5% below the national average, whereas Lagos state had as high as 88.3%; and Bendel 44.9% above the national average population per doctor (see Table 2.5).

Because of the importance of hospitals in the health care delivery it would be expected that their distribution should also be in accordance with the size

of the state concerned. This is in essence that in very small states it will be easy for people to travel to the next available hospital with less inconvenience compared with the large states where distance might be a constraint. The national average is one hospital per 1697.2 km^2 (Onokerhoraye, 1984: 125). But some states have very high figures of hospital/area of territory (km^2). For example, Imo, 1:206; Anambra, 1:220; Oyo, 1:303; River, 1:449; and Lagos, 1:507 (Onokerhoraye, op cit), which are quite above the WHO's standard for developing countries of one hospital per 800 km^2. On the other hand, the worst states are Sokoto, 1:22,724; Borno 1:10,471; and Gongola, 1:9,472.

Similar pattern may be observed in the distribution of dispensaries and rural health centres among the states,

Table 2.5

DISTRIBUTION OF DOCTORS BY STATES IN NIGERIA, 1979

State	No. of Doctors	Popn per Doctor	% Deviation from National Mean
Anambra	382	15,929	+37.3
Bauchi	69	52,129	-134.5
Bendel	293	12,426	+44.9
Benue	82	43,788	-97.0
Borno	88	50,393	-126.7
Cross River	148	34,768	-56.4
Gongola	92	41,895	-88.5
Imo	184	29,530	-32.9
Kaduna	159	38,133	-71.6
Kano	160	53,397	-140.2
Kwara	86	29,494	-32.7
Lagos	924	2,594	+88.3
Niger	32	55,225	-148.4
Ogun	99	23,178	-4.3
Ondo	106	38,098	-71.4
Oyo	421	18,308	+17.6
Plateau	153	19,597	+11.8
Rivers	141	18,046	+18.8
Sokoto	98	68,518	-208.3
Nigeria	3,717	22,228	

Source: Adapted from Onokerhoraye, 1984, p. 126.

Table 2.6: Distribution of Dispensaries and Rural Health Centres in States in Nigeria, 1975

State	Population Per Dispensary	Population Per Rural Health Centre
Anambra	110,854	93,351
Bauchi	21,538	599,483
Bendel	15,829	43,865
Benue	92,341	121,842
Borno	35,195	31,657
Cross River	43,980	2,572,850
Gongola	22,672	770,860
Imo	64,694	142,986
Kaduna	27,435	6,063,200
Kano	64,236	1,067,937
Kwara	38,431	362,357
Lagos	22,189	31,300
Niger	33,984	252,457
Ogun	18,211	764,866
Ondo	25,246	59,241
Oyo	30,612	80,246
Plateau	20,967	1,499,150
Rivers	62,061	133,921
Sokoto	58,902	479,628
Nigeria	34,396	202,000

Source: Onokerhoraye, 1984, p. 129.

Table 2.6 shows that some states have very low figures of population per dispensary while others have high figures. Again the table shows some very frightening figures for the distribution of rural health centres. The table indicates that there about 202,000 people per rural health centre in Nigeria in 1979. Some states such as Ondo, Bendel, Borno, Oyo and Anambra had less than 100,000 per rural health centre whereas Cross River, Benue, Kaduna, Kano and Plateau had over a million people per rural health centre.

This marked disparity is very frightening indeed because of the fact that it is largely in these rural health centres that preventive health care services are co-ordinated in the country and with this deplorable situation in some states, the "Health for All by the Year 2000 AD" seems a mirage.

However, according to Onokerhoraye (1984) the factors responsible for the uneven distribution of health facilities can be adduced from the role the Christian missions in establishing modern ~~mid~~ medical services early in some parts of the country, manpower distribution, and self-help activities of various localities in the country, and the process and pattern of urbanization in Nigeria.

CHAPTER THREE

PHYSIOGRAPHIC, SOCIO-CULTURAL AND ECONOMIC BACKGROUND OF PANKSHIN LOCAL GOVERNMENT AREA

3.0 Introduction

The background to the study area is divided broadly into (i) location and physiographic features, (ii) historical and socio-cultural characteristics, and (iii) economic characteristics.

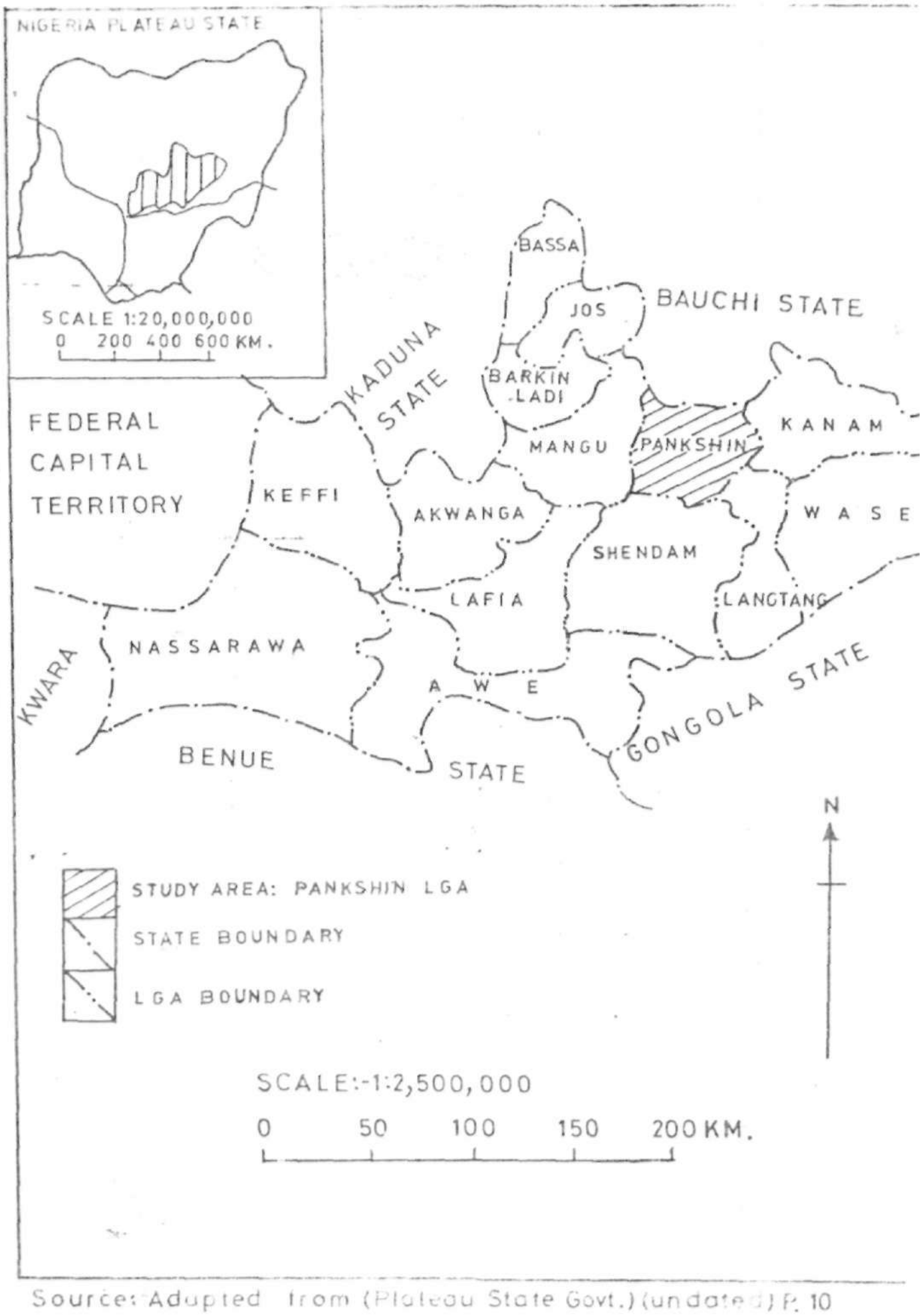
3.1 Location and Physiographic Features

3.1.1 Location

Pankshin L.G.A. is situated some 120 km southeast of Jos with Pankshin town as the LGC headquarters. The LGA is to the north by Bauchi state and to the south by Shendam LGA; to the east by Kanam and Langtang LGAs; while to the west by Mangu LGA. Pankshin LGA is one of the fourteen LGAs in Plateau state of Nigeria (see Fig. 3.1).

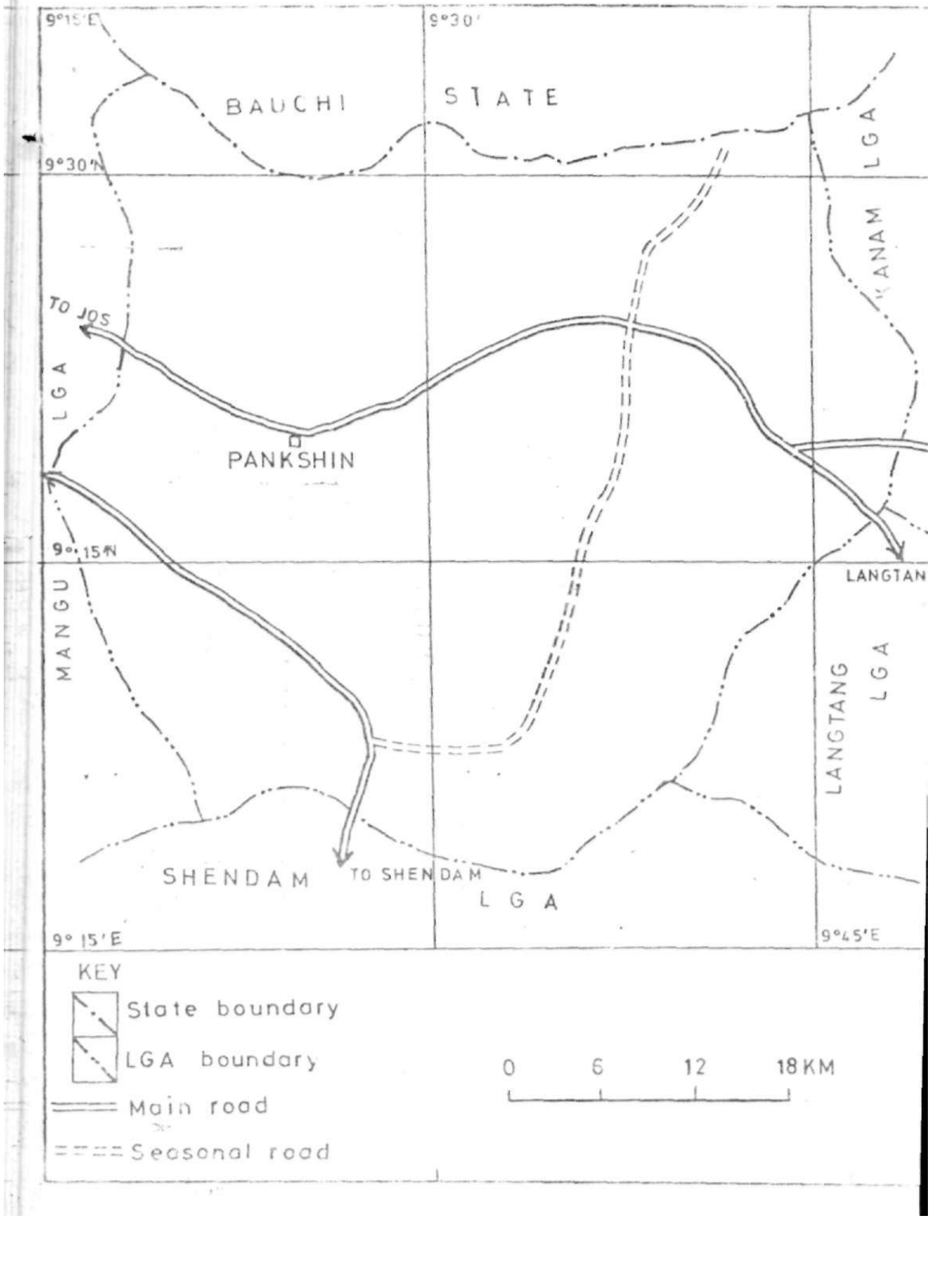
The study area is located between 9° 01'N and 9° 31'N; and 9° 15'E and 9° 47'E with longitude 9° 30'E dissecting the LGA almost equally (see Fig. 3.2)

FIG. 5.1: PLATEAU STATE LGA: THE STUDY AREA



Source: Adapted from (Plateau State Govt.) (undated) P. 10

FIG. 3-2: PANKSHIN LGA: RELATIVE & ABSOLUTE LOCATION



3.1.2 Physiographic Characteristics

3.1.2.1 Geology and Geomorphology

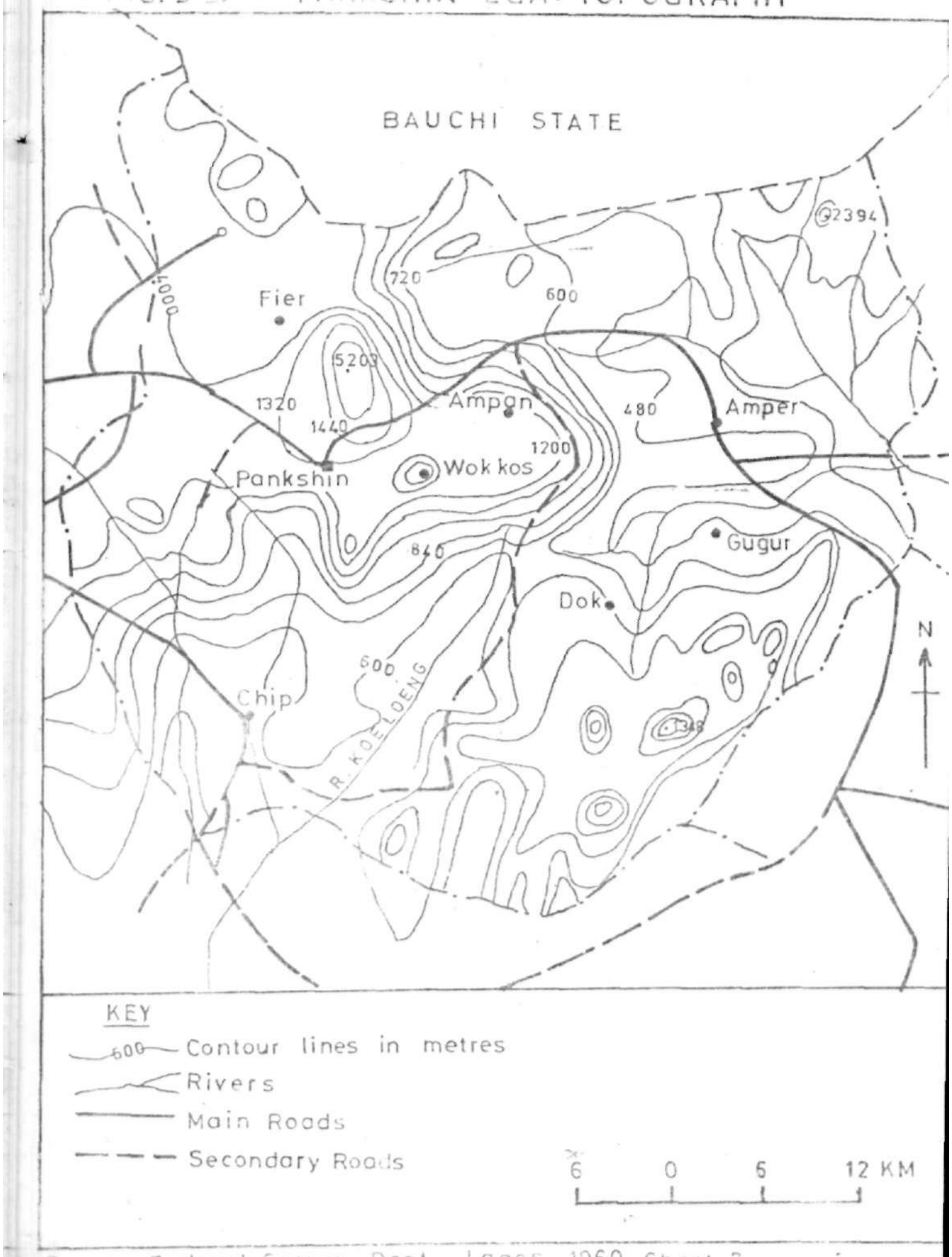
With its location on the Jos Plateau, the surface rocks and hills of the area are composed of the Pre-Cambrian Basement complex. The volcanic rocks of the area consist of basalt flows and cones made up of metasediments and older granite, and undifferentiated igneous and metamorphic rocks (Akintola, 1982). These rocks are neither porous nor permeable, except where they are deeply weathered or have zones of weaknesses such as cleavages, joints, fissures and shatter helts (Ayoade and Oyebande, 1978).

Geomorphologically, this area has long been subjected to chemical and physical weathering, and has decomposed to clays of varying colours from pure white to red and purple (Buchanan and Pugh, 1969 and Akintola, 1982).

3.1.2.2 Relief and Drainage

Almost three-quarters of Pankshin LGA consist of hills and hillocks. There are very steep slopes to the eastern and southern parts of the LGA. Elevations vary from between slightly below 480 metres (1600 ft) and rising sharply to above 1560 metres (5200 ft) above sea level (Fed. surveys, 1960). Fig 3.3. clearly

FIG. 3·3: PANKSHIN LGA: TOPOGRAPHY



Source: Federal Survey Dept., Lagos 1960, Sheet 7

shows the topography of the area which indicates that only the north-western parts have a gentle rise to 1560 metres above sea level.

The surrounding hills in some localities are characterised by a primary system of faults striking more or less parallel to one another. Uplifts and down throws of block-like portions created a local horst graben-like structurctures in some areas (Thorp, 1975). Some of the prominent hills include Tembis Hill (1586 metres) Wulmi Hill (1501m), Kutchi Hill (1304m) and numerous local hill outcrops in the localities.

The hydrology of the area is influenced by the relief. Fig 3.3 clearly illustrates that the area has a radial drainage system. The drainage is influenced by the mountainous nature of the catchment area with very steep gradient making rivers descent the escarpments with rapids and falls towards the north-east, south and east of L.G.A. These rivers have V-shaped valley in the upper course. The upper courses of these rivers are underlain by crystalline basement rocks consisting of gneiss and schist which are extensively intruded by granite grandoiarite and syenitic rock types and locally covered with basalt flows (Fed. Rep. of Nigeria, 1978). The lower basins are underlain by sedementary rocks chiefly sandstone or shale.

The features at the upper courses of the rivers form conducive environment for the breeding of simulium the vector of onchocerciassis that breeds well along fast flowing rivers and streams. On the other hand the lower courses are favourable for the breeding of snails, the vector of schistosomiasis.

The main rivers in the catchment area include the Rivers Gwaska, a tributary to the Gongola River; Jingar, a tributary to the Wase River and the Shemankar, all of which empty their waters into the River Benue.

Asseez's estimate (in Agoade and Oyebande, 1978) or porosities of weathered rocks of the basement complex to be between 1% and 3% making permeability very low, though the zone of weaknesses are common, they tend to be too localized to be of any significant importance as reservoirs of water during the dry season. This apart, the hydrology of the area is also influenced by the pattern of rainfall with its definite dry season from November to April.

3.1.2.3 Climate

The climate is tropical continental but this has been highly modified by the high attitude of the area.

(1) Rainfall

There are a number of rainfall stations which had at one stage or another been sending data to Lagos, but most have ceased to be operating now. Annual rainfall values at six rainfall stations within the area show a remarkable degree of variability. A part of the variation could be accounted for by the steep catchment and localized thunderstorm, which are responsible for most of the precipitation. Table 3.1 illustrates this phenomenon.

Table 3.1

Mean Monthly and Annual Rainfall of Some Stations in the Study Area (mm)

Station	Years of Record	J	F	M	A	M	J	J	A	S	O	N	D	Annual Rainfall
Pankshin	38	2.5	2.5	17.8	55.9	109.0	132.1	193.0	264.2	215.9	68.9	5.1	-	1064.1
Amper	17	-	2.5	10.2	55.9	111.8	101.6	142.2	210.8	182.9	88.9	2.5	2.5	911.8
Kadun	16	2.5	-	7.6	88.9	119.4	159.5	233.7	276.9	230.2	48.3	2.5	-	1167.5
Kwalla (Chip)	13	-	-	5.1	73.7	83.8	162.6	247.3	292.1	246.4	114.3	22.9	-	1275.2
Kwahzak	11	-	-	30.5	81.3	86.4	127.0	238.8	284.5	223.5	78.7	-	-	1150.7
Gwong Jing	-	-	-	27.4	80.7	149.6	158.9	196.3	253.2	235.5	61.2	-	-	1155.8

Source: Field survey, 1988

Another feature of the rainfall pattern is that it rises gradually from the month of April and reaches its peak in August and starts to decline into the dry season in the month of September. The beginning of the rainy period is always accompanied with some dry spells.

The seasonality which characterizes the rainfall of the area, the duration and regimes of the wet season and the number of months with less than 100.0 mm per month have significant impact on agricultural activities of the people rather than rainfall totals alone. These determine the period of labour peaks and the timing of land-clearing, planting and weeding operations.

(2) Temperature

Like rainfall pattern, the temperatures of the area vary from on locality to another especially between the lowland and escarpment areas and the highlands around Pankshin town and its environs. The annual mean maximum temperature therefor ranges from 26°C (80°F) in Pankshin and its surrounding settlements to 32°C (90°F) in Kwabzak, Mper and Kwalla (Field survey, 1988). The mean monthly air temperature is lowest in January and highest in March in all locations.

[illegible] of [illegible] in the [illegible] for water and these also contribute to excessive losses of body mineral ions through sweat. Furthermore, the distribution of vectors and other organisms also varies with the temperature pattern. As Gasch (1978) observes, for Plasmodium vivax, the organism causing benign tertian malaria, the mosquito phase of the life cycle is completed in 7 days at the optimal temperature of 28°C (83°F) and more days for lower temperatures, while the most dangerous malaria parasite, plasmodium falciparum, requires a minimum of 21.6°C (70°F) for transmission.

(3) Wind System

The surface winds, with local variations, conform to the main currents of the airmasses. Throughout the year the great majority of the prevailing winds are either N.E. or S.W. The N.E. winds start to blow across the whole area from October to mid-March. These are usually very dry, cold, dusty winds which reduce visibility to near zero especially in December through January to early February. This system therefore corresponds with the harmattan, the tropical continental air streams which flow from the Sahara across the country. Because of the altitude of this area the

mean annual minimum temperatures during this time are usually low such as between 7.7°C (46°F) and 11.1°C (52°F) between December and February as recorded in Pankshin town in 1971 and 1972. The mean relative humidity for the same period was between 8% and 3% (Field survey, 1988).

Between April and September the South-westerlies blows over the area. These are warm, moist winds which bring along with rains. Here again the relief plays its role to the type of rainfall - orographic rainfall is more frequent to the southern escappments that face the coming winds.

The wind system of the area therefore coincides with the 'movements' of the sun from the tropic of Cancer to the Tropic of Capricorn and vice versa. Thus the movement of the tropical continental air streams (CT) and the tropical maritime airstreams (MT) [illegible]yinso 1978).

3.1.2.4 The Soils

Based on the F.A.O. genetic classification system one major group of soil is identified in Pankshin LGA. This group is made up of ferruginous tropical soils typically on crystalline acide rocks and lithosols on

ferruginous crusts (Lar Ita, 197) in the highlands and lowlands of the area respectively. The soils are generally shallow and stony especially in the rocky areas of the escarpments and soils with free to imperfect drainage are confined to the lowlands and river valleys and floodplains in these relatively flat lands.

3.1.2.5 Vegetation

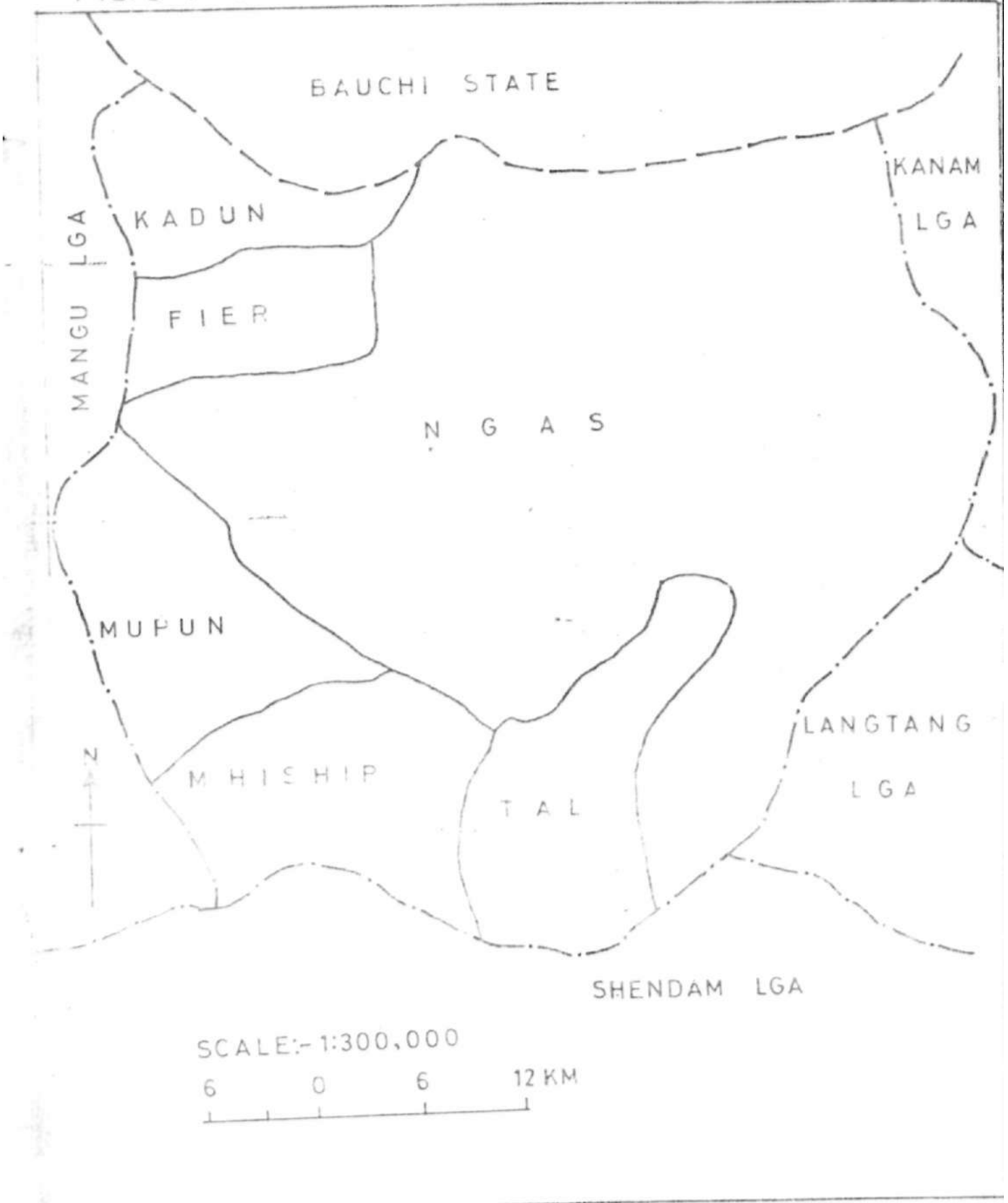
The vegetation is characterized by widespread shrub savanna and savanna woodlands, while the natural vegetation of the lower valleys has been removed by agricultural activities. The general appearance of the vegetation on uncultivated land, and a comparison with forest reserves, suggests that throughout the area the vegetation is adversely affected by human activities namely bush burning, uncontrolled grazing and extraction of the vegetal resources for fuelwood and building materials.

3.2 Historical and Socio-Cultural Background

3.2.1 Historical Background

The historical background of the people in the area is based largely on the writings of the early colonial administrative officers and missionary

FIG. 3 4 :PANKSHIN LGA: MAJOR ETHNIC GROUPS



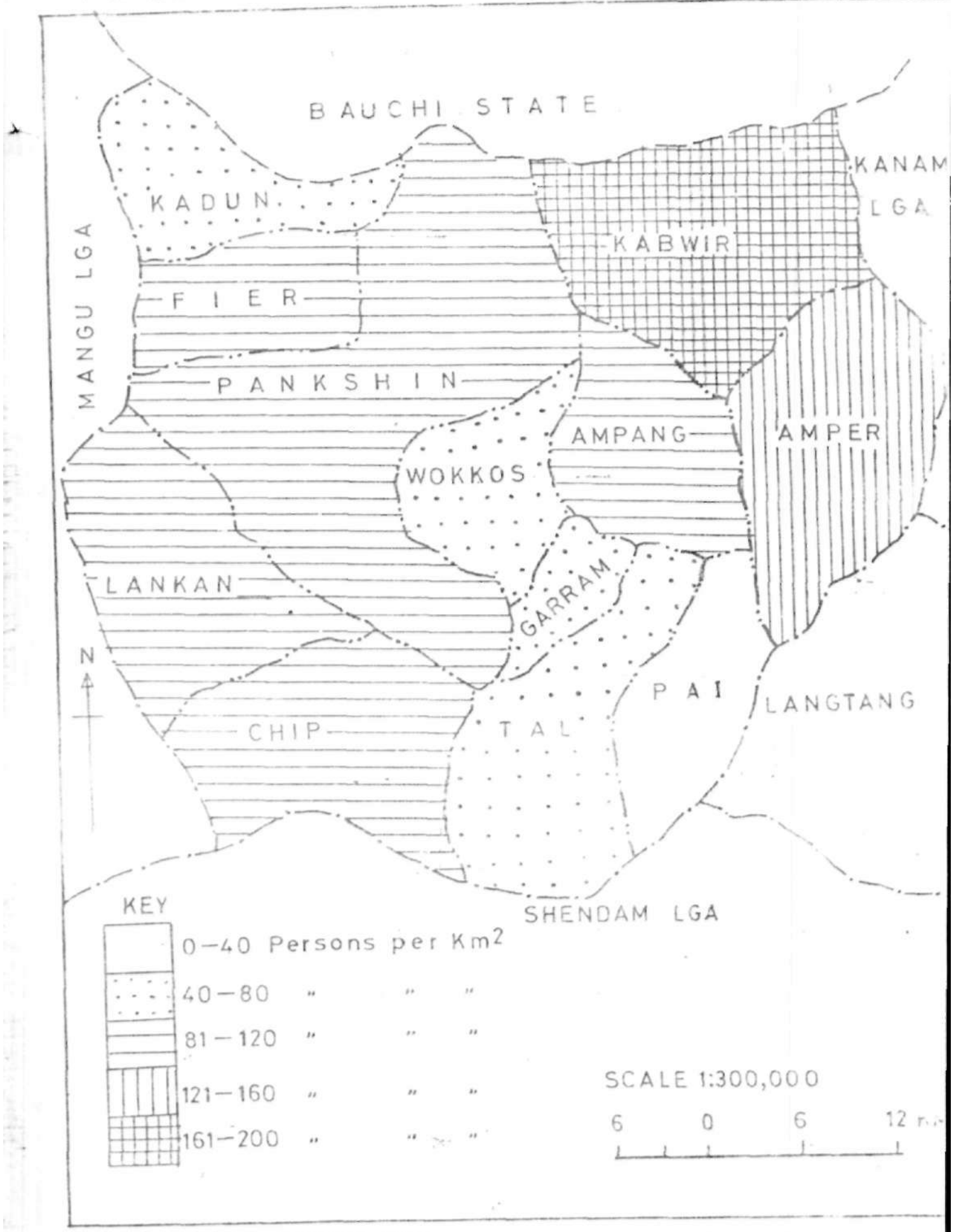
Source: Field Survey, 1988

evangelists and oral traditions passed on from one generation to another spiced with local myths and legends.

However, the origin of the people could be inferred from some available records largely based on cultural and linguistic sources. Some early scholars who have carried out some studies in this area and Jos Plateau in general include Ames (1934), Ballard (1971), Fagg (1956), Greenberg (1965), and Temple and Temple (1965). Most of these scholars point to the fact that these people were among the pre-Kanuri inhabitants of Bornu. They were driven from Bornu sometime between 1100 A.D. and 1300 A.D. by other tribes (Siknitbis, 1985). After years of travelling they eventually came to a place called Yam in the north of Kanam district. Later on this group split into several branches as a result of an alleged quarrel to emerged to form the present ethnic groups in the LGA. (see fig. 3.4). Some members of the group are said to have moved into part of Shendam LGA.

Linguistic evidence has it that the Angas, Chip (Chiship), Ryer, Kwanka (Kadda), Pai, and other languages in the area are part of the Chadic group of languages (Bendor-Samuel, 1982). And the people

FIG. 3.5: PANKSHIN LGA POPULATION DENSITY



Source: Field Survey, 1988

who speak these languages are found predominantly in the most inaccessible mountainous areas of the central and western Middle Belt. This Chadic group of languages belongs to the Afroasiatic family (Gandor Samuel, op cit.) which by implication these people must have migrated from the east to the present area.

3.2.2 Population

Using the 1963 census figure as base and projecting to 1988, at a 2.5% cumulative increase, Pankshin LGA, has 229,429 inhabitants (computed from Plateau state Statistical Yearbook, 1978) which represents 6.3% of the total population of the state (in 1988). With a spatial area of 2334km^2, the LGA has a population density of 98 persons per KM^2 in 1988. But there are variations in the density between districts which range from 30 persons per km^2 in Pai District to 167 persons per km^2 in Kabwir District (Field Survey, 1988). Fig. 3.3 and Table 3.2 show these variations in the population distribution between districts.

Table 3.7

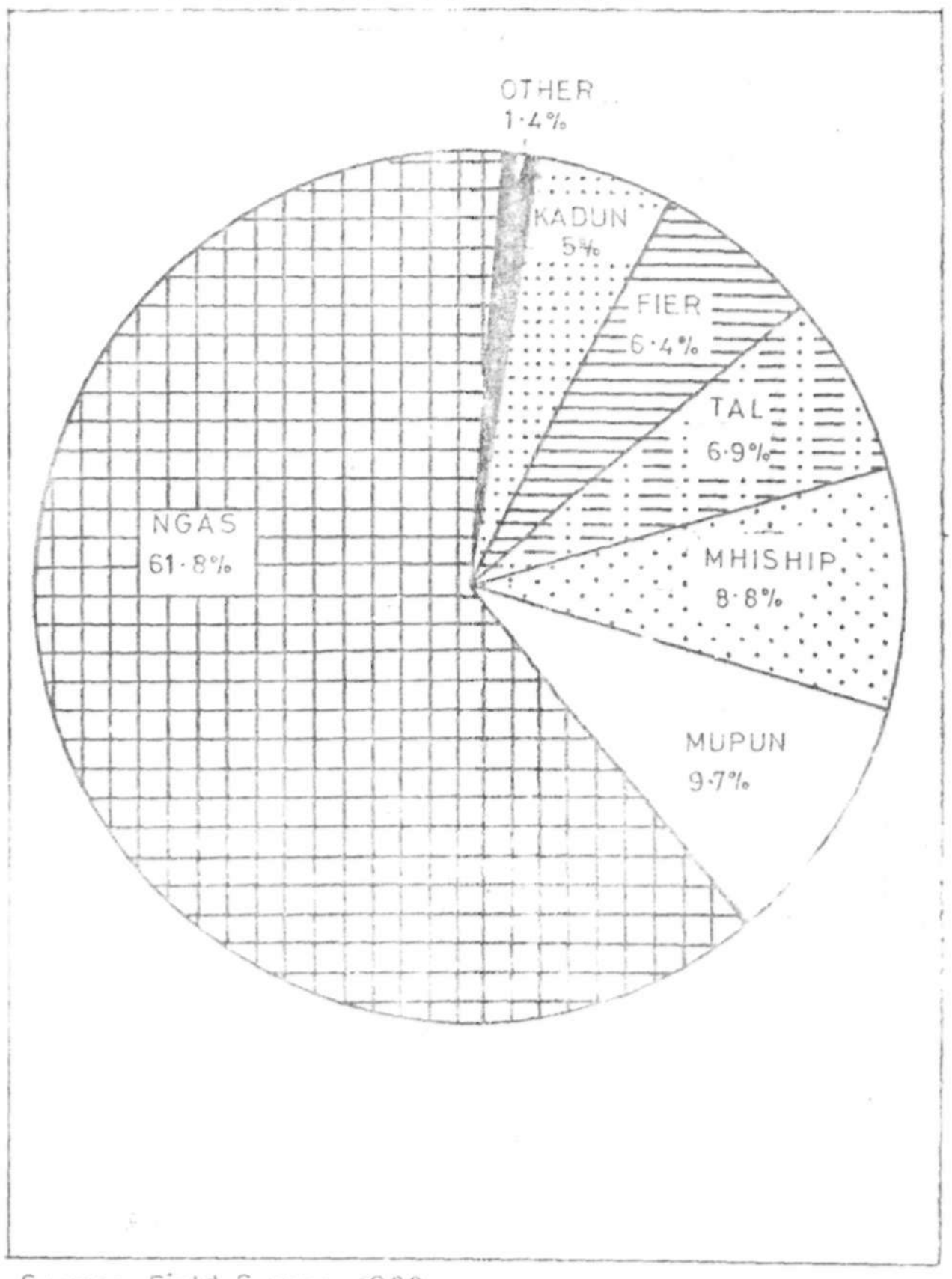
Pankshin L.G.A. Population Density

District	Land Mass (km^2)	Pop. Density
Pai	159	38
Kadun	182	64
Wokkos	144	65
Tal	220	72
Chip	205	88
Lankan	220	91
Fier	152	96
Garran	99	104
Pankshin	385	105
Ampang	144	118
Amper	212	144
Kalwir	212	167
Pankshin	2,334	93

Source: Land area calculated from topographical map obtained from Plateau state, Land and surveys, Jos.

About 4.2% of the total population reside in Pankshin town, the LGC headquarters while 95.8% of the population reside in small rural settlements and dispersed homesteads.

FIG. 3.6 PERCENTAGE PROPORTION OF MAJOR ETHNIC GROUPS



Source: Field Survey, 1988

3.3.3 [illegible]

Pankshin LGA has Ngas, Chip (Ibichip), Mupun, Fier, Kadun (Kwanka) and Tal as its predominant ethnic groups. These major ethnic groups constitute their respective social area, which in essence calls for social area analysis (Johnston (ed), 1981, Strobino, et. al, 1982, and, Oruta, et al 1986) since they occupy different 'socio-geographic' space. The breakdown of the ethnic groups by population is as follows Ngas, 61.8%; Mupun, 9.7%; Chip (Ibichip) 8.8% Tal, 6.9%; Fier, 6.4%; Kadun, 5.0% and Others (Fulani, Ibo, Yoruba and Hausa) 1.4% (Field survey, 1988). Each of the ethnic groups has a slightly different dialect from one another. Fig 3.6 illustrates the distribution of the ethnic groups.

3.3.4 Settlement Pattern

A settlement is a creation discernible unit of space, a tie between man and his dwellings, and which distinguished from its environment, as somewhere to live, and usually also to work (Lancaster, 1973). Settlements have both a site and a situation. The village is the dominant social and economic unit of the rural inhabitants.

Because of the extensive hills and hillsides 'competing' for horizontal and vertical space, settlement pattern in the study area has been enormously influenced by the physiographic factors. Over 75% of the villages are widely scattered over hills and hillsides and relatively flat narrow strips of land between hills and groups of boulders. Some villages are split up into a number of small hamlets on the gently flat land surfaces to the southern and north-eastern escarpment and the plateau to the west and north-west of 'contour 1320' (see fig 3.3). These settlements resemble the characteristically dispersed homesteads of the Kofyar (Netting, 1968).

3.2.5 Transport System

Villages are inter-linked with narrow paths. Communications between the settlements are usually difficult because of the ruggedness of the terrain. During the rainy season certain paths become impassible at certain points because of flooded rivers and tributaries with turbulent rapids and falls.

However, there are only two major roads that pass through the area - a laterite road from Panyam through Chip to Shendam and a tarmac road from Panyam through Pankshin - Amper-Langtang to Shendam. The

major roads in the area is therefore 4.5km per 100km^2 while the seasonal roads have a density of 3.4km to 100km^2. (Calculated from topographical map sheet 7).

Formula for Road Density:

$$RD = \frac{LR}{A} \times \frac{100}{1} \text{ where}$$

RD = Road density

LR = Total lengths of road in the region (Km)

A = Area of region (Km^2)

The lengths of these roads have increased because they meander through passes between the hills and escarpments. The road density is quite below the U United Nation's standard, a minimum of 10km per 100km^2 for developing countries (Haggett, et al, 1977).

Apart from the low road density there is also low traffic flow along these major roads and more especially the Kenyan-Uganda-Rwanda when-ever the vehicles are damaged; hence the movement of people and goods to central service points is being hampered...

3.2.6 Social Structure and Organization

The social structure ranges from the family unit whose head is always a married male adult through the clan with the head being an elderly male who is regarded to have a versed knowledge of the ancestors and the living. The clan head is usually the 'chief priest'

of that particular clan to which he belongs. It is in this web that the family system becomes very extended to comprise even more than three to five generations within the localities (Field Survey, 1988). It is however the conglomeration of these several families and clans that constitute a village delimitation. However this delimitation should not be regarded as a closed system. These villages/hamlets in turn have their various heads who are directly answerable to the district head for dissemination of informations and innovation from the government through the district head to their various settlements. And on the other hand sending feedback to the district head.

The village and district heads are chosen from among the members of the 'royal family' and any of the district heads can be chosen to be the paramount chief of the LGA whenever the stool is vacant.

The family, clan and village settings are the avenues for the instillation of traditional customs and beliefs in the growing generations and these mores are then held to steadfastly. Nevertheless the long period of human childhood and dependency is used everywhere for ✗ learned socialization, for absorption of and indoctrination into the prevailing value structure.

The [illegible] is that every culture is liable to carry forward beliefs regarding health, disease and the causes of illness that may be deemed bizarre by an outside observer. And how the people are organized to solve any health problems. With health apart, social structure and organization have implications for some of the production organization and institutions that would improve the well-being of the inhabitants. Kinship relation is a primary factor not only in determining access to land but also in the organization of labour and of residence (Mabogunje, 1980). The supply of labour for agricultural production is generally provided by members of the extended family. Beside organizations for the supply of labour to individual family farms, there are also organizations for undertaking communal tasks such as the repair of pathways, thatching of houses and maintenance of the compound of the village head and district head.

3.3 Economic Characteristics

3.3.1 Agriculture

Agriculture is the primary activity of the area. The present agriculture is largely subsistence agriculture with only a small proportion of the land devoted to cash crops.

[illegible] preparation is [illegible] carried out almost entirely by hand hoe, and harvesting is also by hand. Animal drawn implements do not appear to exist in the area, and the tractor ploughing service is not widely utilized either as a result of the terrain of most parts of the area or other reasons in the areas where the terrain does not pose any threat to the tractor. But chemical fertilizers are extravagantly utilized these days in place of organic manure such as farmyard manure and animal droppings (Field survey, 1988).

A wide range of crops is grown, the main ones being sorghum and millet. Rice has recently become an important crop that can be considered to be the main cash crops in lowland region of the study area more especially in Chip and Pal districts. Other crops include maize which is a cash crop for the farmers on the 'plateau' of the study area, cotton, groundnuts, sesameseed (benniseed) and a number of minor species - wheat, roselle and okra. Root crops such as cassava, sweet potato, cocoyam and yam and a variety of tropical vegetables are widely grown.

The main fruit crops are oil palm trees, olive trees (atili) locust bean trees and mango trees are

tendered on the farm while some grow wildly in the uncultivated bush, especially locust bean trees.

The farming system is based mainly on mixed cropping. The crops may be sown on ridges at the beginning of the rainy season in the furrows between the ridges, or on ridges re-formed along the crops which have been planted in the furrows when these are being weeded. The principal crops mixed are usually sorghum with millet, cowpeas, groundnuts and okra undersown in varying proportions. Some of the land is also used for seperate cropping especially late sown millet, maize, groundnuts, rice, beniseed, yams and cocoyams.

There does not appear to be much 'slash and burn' cultivation (Norrill, 1974) but there is a type of unsystematic rotation in which the locations of the fields and of the crop mixtures change from year to year.

Terrace farming is extensively practised in the escarpment areas and hillsides and gently sloping areas. This is basically to avoid soil erosion and to maintain the soil water and fertility. In spite of the practice of immediately hoeing crop residues back into cultivation ridges as a means of showing the decline in organic matter levels, the level of soil fertility is low.

Efforts are however, being made to raise soil fertility through applying single superphosphate and of sulphate of ammonia, the use of which has been steadily growing in recent years. The implication is the pollution of water sources by the chemical fertilizers through run-off or infiltration.

With the exception of dwarf cattle (muturu), the local farmers do not normally keep cattle, but the nomadic or semi-nomadic Fulani pastoralists run their herds through the region to make use of the grazing on the crop reidues left after the harvest in the dry season. Livestock other than cattle which are maintained by many farmers include mostly goats, sheep, pigs, dogs and poultry.

3.3.2 Traditional Industry and Crafts

This is the secondary sector of the rural economy. In considering traditional industries Baucom (1973) has classified them into (i) processing of agricultural food products, (ii) conversion of hides and skins into leather (i.e. tanning), (iii) conversion of cotton lint into yarn (i.e. spinning), (iv) smelting, casting and smithing (using ferrous and non-ferrous minerals), and (v) glassworks.

Elementary processing of agricultural products such as production of flour from grains, oils from oil-palm fruits and olive fruits, and local condiments (daddawa) from locust beans and parrel seeds; and wine (burukutu) and gruel from grains are among the important traditional industries in the area.

Smithing carried out by men only is widely diffused in the area thereby meeting everyday needs of the rural community e.g. local farm implements as hoes of various sizes, sickles, axes, knives/ swords, arrows and spears. These implements are of significant importance in the agricultural activities of the people.

Crafts such as woodworks - making of wooden musical instruments, farm and household utensil handles; mats and basket making; clayworks, i.e. the making of pots of various sizes for different purposes e.g. for cooking, for houses; and weaving of cloths. Wool cloths are among the various crafts practised in the area.

2.4 The Relationship Between the Physiographic, Socio-Cultural and Economic Background and Health Situation of the Study Area

Disease cannot arise without the convergence at a certain point in time and space of two factors,

namely the factors that make the term of an environmental stimulus and the factors that condition the response of human tissues to the environmental stimulus. The environmental factors that may place human tissues in jeopardy vary with the geographic and cultural locations of the people. For instance, the topography of the area is hilly and mountaneous thus making rivers and streams to form rapids and falls as they descend the escarpments of the plateau. The descent of these rivers and streams consequently increases the velocity of the flow of the water thereby creating very good oviposition sites for the simulium, vector of onchocerciasis which plagues some parts of the study area.

In the case of malaria and schistosomiasis, rainfall distribution combined with the edaphic factors, more especially the ability of the soil to retain water, play an important role in the transmission period by controlling the ecology of the intermediate snails. If the soil is impermeable the water collects on the surface and farm furrows, the breeding of these vectors is possible with the adequate temperature of the area. In addition to these climatic factors, the wind systems that carry dust may in turn, for a short but effective time, carry along pathogenic

bacteria and viruses that cause outbreaks of some airborne diseases at certain period of the year in the area.

Areally, Pankshin LGA is supposed to have three hospitals in accordance with WHO's standard (WHO, 1961) of one hospital per 800km^2 for effective access of the services to the people, but on the contrary there is only one hospital in the area. This situation has made the hospital service converage of the entire population in the area very ineffective and this is further compounded by the rough terrains of the area which the people have to traverse. The transportation system of the area is nothing to write home that will facilitate the accessibility of the hospital and other health care services to the rural inhabitants.

3.5 The Distribution of Health Care Facilities in Plateau State

As we have seen in the distribution of the structure of health care facilities and services among states there is a remarkable disparity in the distribution of health care facilities in Plateau state. Table 2.7 suggests marked variations among the LGAs in the state. It demonstrates that the average area served by each hospital in the is 3615 Km^2, but there is a significant variation around this average from one part of the state to another. The best served LGA in the state in terms of accessibility to the health care services is Jos LGA where the area served by one hospital is 242km^2 and walking radius of 8.8 km with 443 people per hospital Bed and 6062 people per doctor. On the other hand as shown in Table 2.7 there are five LGAs without hospitals hence they have to depend on the neighbouring LGAs whose health care services have been saturated with very high population pressure and thereby increasing their care service areas from those shown in the table. This in essence suggests that some people in certain parts of the state have to travel more than 70km before getting to hospital services.

Table 5.7

Distribution of Hospital Facilities by L.G.A.in Plateau State in 1987

L.G.A	Projected Popu. to 1987*	No. of Hosp.	Popu. per Hosp. Bed	Popu. per Doctor	Area Served by a Hosp. Km^2	*Walking Radius of a Hosp. Km
Akwanga	321,544	1	2680	160,772	3413	33.0
Awe	225,215	-	-	-	-	-
Barakin Ladi	243,945	1	2711	60,986	1957	25.0
Bassa	204,292	1	3405	204,292	1776	23.8
Jos	460,743	7	443	6,062	242	8.8
Kanam	173,876	-	-	-	-	-
Keffi	306,786	1	2360	102,262	6019	43.9
Lafia	298,449	1	2487	74,612	2737	29.5
Langtang	132,102	1	1468	26,420	2476	28.1
Manga	270,451	-	-	-	-	-
Namarawa	27[illegible]	-	-	-	-	-
Pankshin	228,429	1	1977	57,336	2354	27.[illegible]
Shendam	367,387	1	4304	96,847	5323	41.[illegible]
Wase	129,783	-	-	-	-	-
Plateau	3,663,922	15	1974	35572	3615	33.9

* Population projected from Plateau State Statistical Year Book (1976:10) See P. 77.

Source: Pleateau State Ministry of Health, 1987 and Field Survey 1987.

Walking radius of a health service centre can be calculated using the following formula:

$$WR = \sqrt{\frac{A}{C} \div \pi}$$

Where WR = Walking Radius

A = Area of the region (km^2)

C = Number of health service centres

$\pi = \frac{22}{7}$ i.e. the area of the region is taken to be an area of a circle.

For example Akwanya L.G.A:

Area of the L.G.A = $3413km^2$

No. of hospitals = 1

$$\therefore WR = \sqrt{\frac{3413}{1} \div \frac{22}{7}}$$

$$= \sqrt{3413 \times \frac{7}{22}}$$

$$= \sqrt{1085.954}$$

$$= 32.95$$

$$= 33km.$$

Conclusion: The calculated walking radius to the hospital in Akwanga L.G.A therefore, is 33km.

Spatial disparity in the distribution of medical facilities in Plateau state is not confined to hospitals alone, but also maternity centres and dispensaries and the personnel, and other health related sectors such as potable water supply, physical linkages and environmental health education.

The spatial disparity still shows its hydra head, within the LGA where most of the available health care services and facilities, and other health related facilities are highly concentrated in the local government headquarters at the expense of the rural areas within the local government areas who are more plagued by various health problems.

3.6 The Implications of the Spatial Disparity of Health Services in Plateau State

A summary of the problems facing health services in Plateau state is as follows:

3.6.1 Low Priority for health

In the national development programmes in general and the state in particular, health does not receive high priority hence it get very small financial resource allocation as compared

economically more appealing industrial or externally induced agricultural programmes.

3.6.2 Imbalances within health Sector

There are quite a number of imbalances within the sector giving rise to emphasis on:

(a) Curative rather than preventive/promotive services.

(b) Urban rather than rural coverage

(c) Hospital care rather than ambulatory care, particularly in allocation of the limited funds.

(d) Quality rather than both quality and quantity of care which can reach a wider population.

(e) Training of specialized doctors for the urban sector rather than auxiliary health workers that will effectively man the rural sector.

(f) Scientific rather than traditional medical practices. This has led to inadequate utilization of traditional healers and birth attendants in providing care and other local health resources.

3.6.3 Shortage of Basic Resources

The limited capital available to the health sector for initial purchase of appropriate facilities, equipment and supplies, and maintenance is a serious impediment to expanding services. This is further compounded by supply management problems, including transport and communication difficulties in getting supplies to where they are needed.

3.6.4 Coverage

Inadequate population coverage and underutilization exists in the health system. The widely dispersed population creates difficulties in achieving effective coverage of the population with the desired health services. Underutilization of available facilities is a problem in some parts of the state. The causes for this are critical factors in planning if most impediments to utilization of services were successfully avoided in developing new programme without socio-political bias.

3.6.5 Community Participation

Insufficient community participation in programme planning and the operating and financing

health services frequently results in services which a community may not understand, desire or use. This is also further compounded by insufficient or ineffective use of health education.

3.6.6 Health Supporting Facilities:

Inadequate or lack of health supporting facilities and services exist in some parts of the state especially in the rural areas. These include safe water supply, sanitary waste disposal system, housing facilities, vector control measures, and appropriate energy supply.

These and other problems need to be carefully addressed for the achievement of the objectives of rural development strategy of the country and the 'Health for All' policy. This study takes a closer look at these problems at a sub-regional level Pankshin LGA, and attempts to demonstrate how rural health care services can be provided more effectively

The next chapter discusses the physiographic, socio-cultural and economic background of Pankshin Local Government Area.

The next chapter in this study analyses the pattern of major health problems of the study area as they vary with the physiographic characteristics of the various rural areas. The chapter further analyses the spatial distribution of health care services in relation to the geographic distribution of the population in the area.

[illegible] LGA AND THE SPATIAL [illegible] HEALTH CARE SERVICES

The discussion of the spatial distribution of health problems will focus on the localization of certain diseases in parts of the LGA as a result of environmental factors or certain demographic factors. The discussion of the spatial distribution of health care services will on the other hand focus on the geographical location of health care services in the LGA and the extent to which the entire population are effectively covered.

4.1 The Pattern of Health Problems in Pankshin LGA

The pattern of health problems vary between one geographic space and another, and between demographic structures.

[illegible] Pattern of Diseases

[illegible] such as [illegible] and 1981), Schwartz (1977) and 1978), Hare (1977), Basch (1978), [illegible] (1979) and Hunter (1980) have carried out studies on the macrogeographical distribution of diseases. These scholars have shown the global variations in disease distribution and have identified some regions

[illegible] Ingene [illegible] Adejuwon (1982) in the study of pests and diseases in Nigeria has identified some health problems that are more prevalent in some states than others.

The spatial pattern of disease distribution is also reflected at the microlevel. Table 4.1 vividly shows the variations in disease distribution according to environmental differences. The table 4.1 uses altitude for different locations as one of the factors that influence the distribution of disease in Pankshin LGA.

Table 4.1

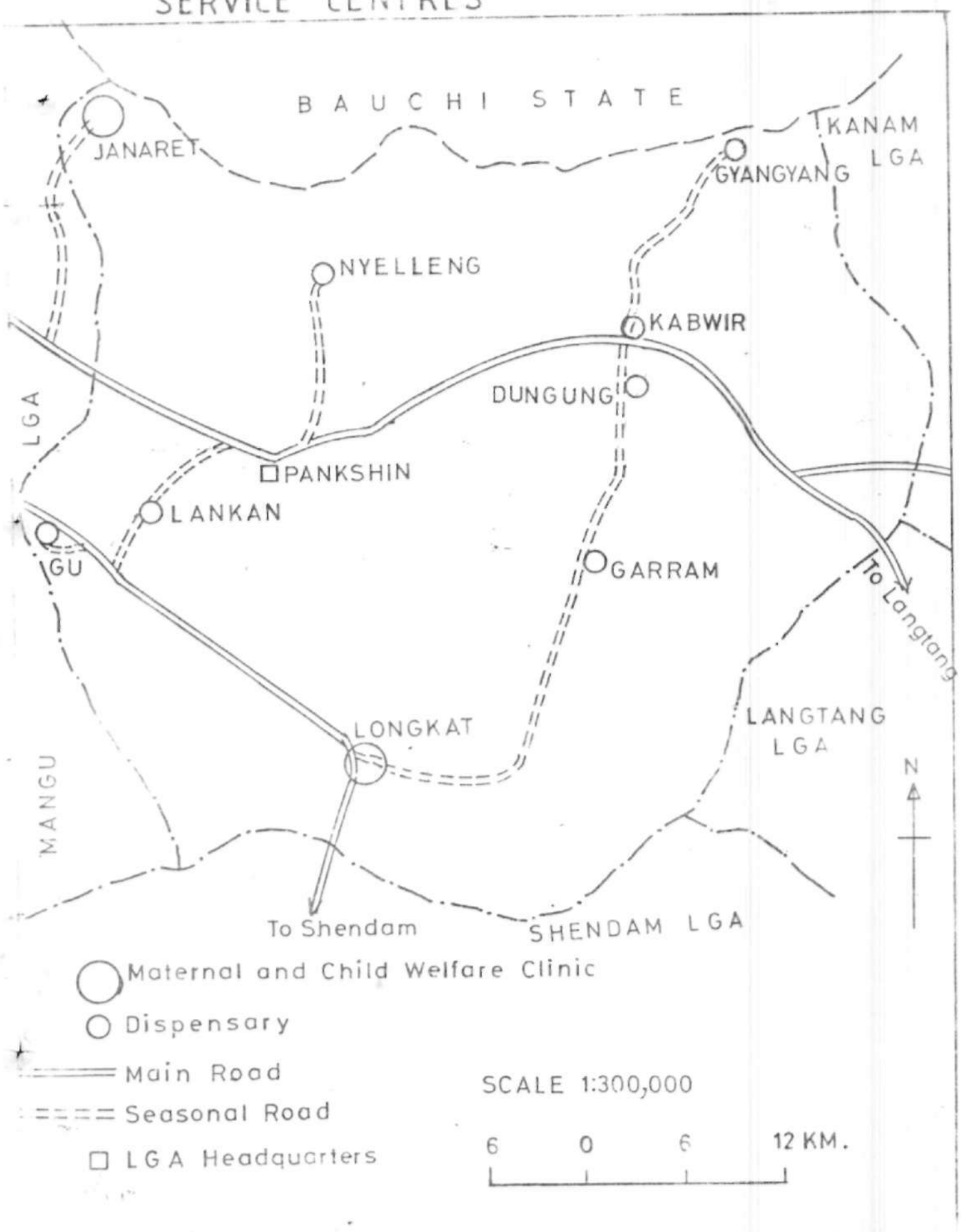
Spatial Distribution of Some Major Vector-Related Diseases in Pankshin LGA 1997

Location of Dispensary/ clinic	Heights above sea level (m.)	Schistos.- miasis (All types)	Onchocerciasis	Filaria- sis	Malaria
Kabwir	630	150	4	104	1,498
Dungun	1,320	3	-	45	530
Garram	670	23	-	85	387
Kyelleng	1,200	36	-	-	625
Gyangyang	490	20	-	56	454
Jannaret	900	51	5	-	677
Longkat	480	491	312	264	907
Kagu (Gu)	1,140	172	40	-	344
Lookan	1,195	110	-	65	214

Source: Compiled from Church of Christ in Nigeria (hereafter referred to as COCIN), Rural Health Programme Headquarters, Kanyam, Jos, 1997. See Fig. 4.1 for location of the dispensaries and clinic. Heights are calculated from topographical map, sheet 7, Plateau, Survey, 1960 (4oft = 12.2 metres).

It could be inferred from Table 4.1 that the distribution of diseases varies with the physical attributes of various localities. For example, Longkat and Gyangyang are on almost the same altitude but

FIG. 4·1: PANKSHIN LGA: COCIN RURAL HEALTH SERVICE CENTRES



schistosomiasis and skin diseases are more prevalent in Longkat than Gyangyang. This could be related to the wind-ward location of Longkat which causes it to receive more rainfall than Gyangyang. Another local variation is that there is an irrigation scheme at Longkat area.

The Kruskat-Wallis analysis of variance (ANOVA) by ranks is usedto analyse the data in Table 4.1 in order to test the assumption that the major health problems are related to environmental features of the rural communities. Here altitude is taken as one of the variables. The formula for computing Kruskal-Wallis analysis of variance is:

$$H = \frac{12}{N(N+1)} \sum^{k} \frac{R^2}{n} - 3(N+1).$$

Where:

R is the sum of the ranks in each sample

n is the number of values in each sample

N is the total number of values, and

k is the number of samples.

The technique can be used for samples with $k > 3$ and with $n > 5$, i.e. when the number of samples is three or more, and the number of values in any one is more than five. Under these circumstances H is distributed

a: χ^2 with (f - k-1) [illegible], etc., [illegible], where

df is the degree of freedom.

Table 4.2

Kruskal-Wallis Analysis of Variance Ranks

Height (m)	Rank	Schisto. (all types)	Rank	Oncho.	Rank	Filariasis	Rank
480	19	491	21	312	18	264	17
630	22	150	15	4	2	104	13
1,320	28	3	1	5	3	45	8
670	23	23	5	40	7	85	12
1,200	27	36	6	-	-	56	10
490	20	20	4	-	-	65	11
900	24	51	9	-	-	-	-
1,140	26	172	16	-	-	-	-
[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

$$H = \frac{12}{28(28+1)}\left(\frac{114^2}{9} + \frac{[illegible]^2}{[illegible]} + \frac{30^2}{4} + \frac{71^2}{[illegible]}\right) - 3(28+1)$$

$$H = \frac{12}{812}(5038.4 + 900.1 + 225 - 840.2) - 87$$

$$= \frac{12}{812}(7073.7) - 87$$

$$= \frac{(84+82.5)}{2} - 87$$

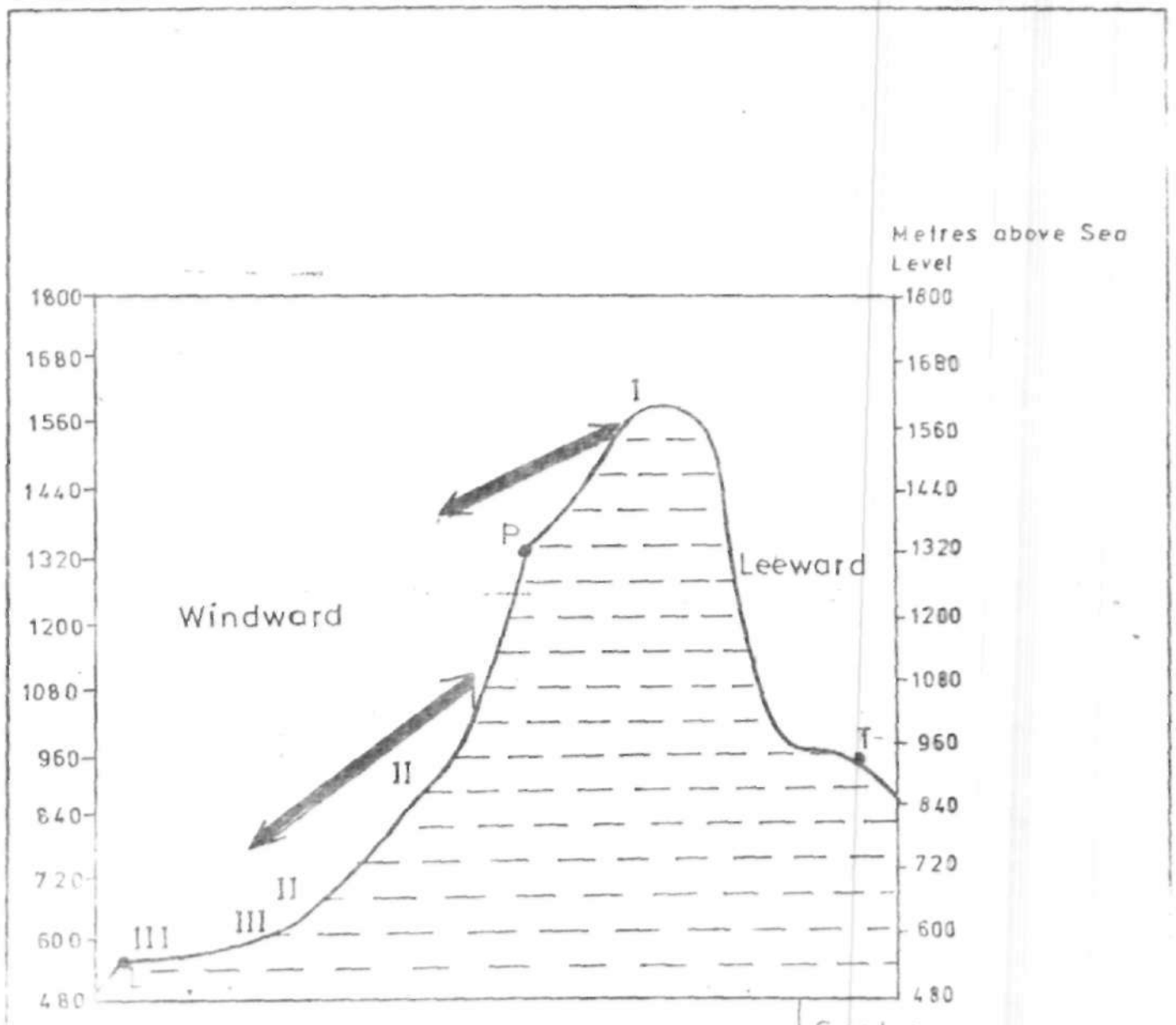
$$= 104.5-87$$

$$H = 17.5$$

The critical value of H as X^2 with df = K-1 = 3 at 0.05 level of significance is 7.82, even at 0.01, X^2 = 11.34. Since the calculated Kruskal-Wallis analysis of variance is very much greater than the critical value, the assumption that environmental variable, in this case altitude influences the spatial pattern of diseases and the vectors, is upheld. For example, the geographic patterns of simulium habitation are strongly linear and riverine in shape. The topography of the service area of Longkat clinic is such that favours the breeding of the simulium - the vector of onchocerciasis. Here the flows of the Rivers Shemankar, Koelong and Vivam and their tributaries are very turbulent in areas in the northern part of the areas the rivers descend the escarpments and consequently, provide for the good environment.

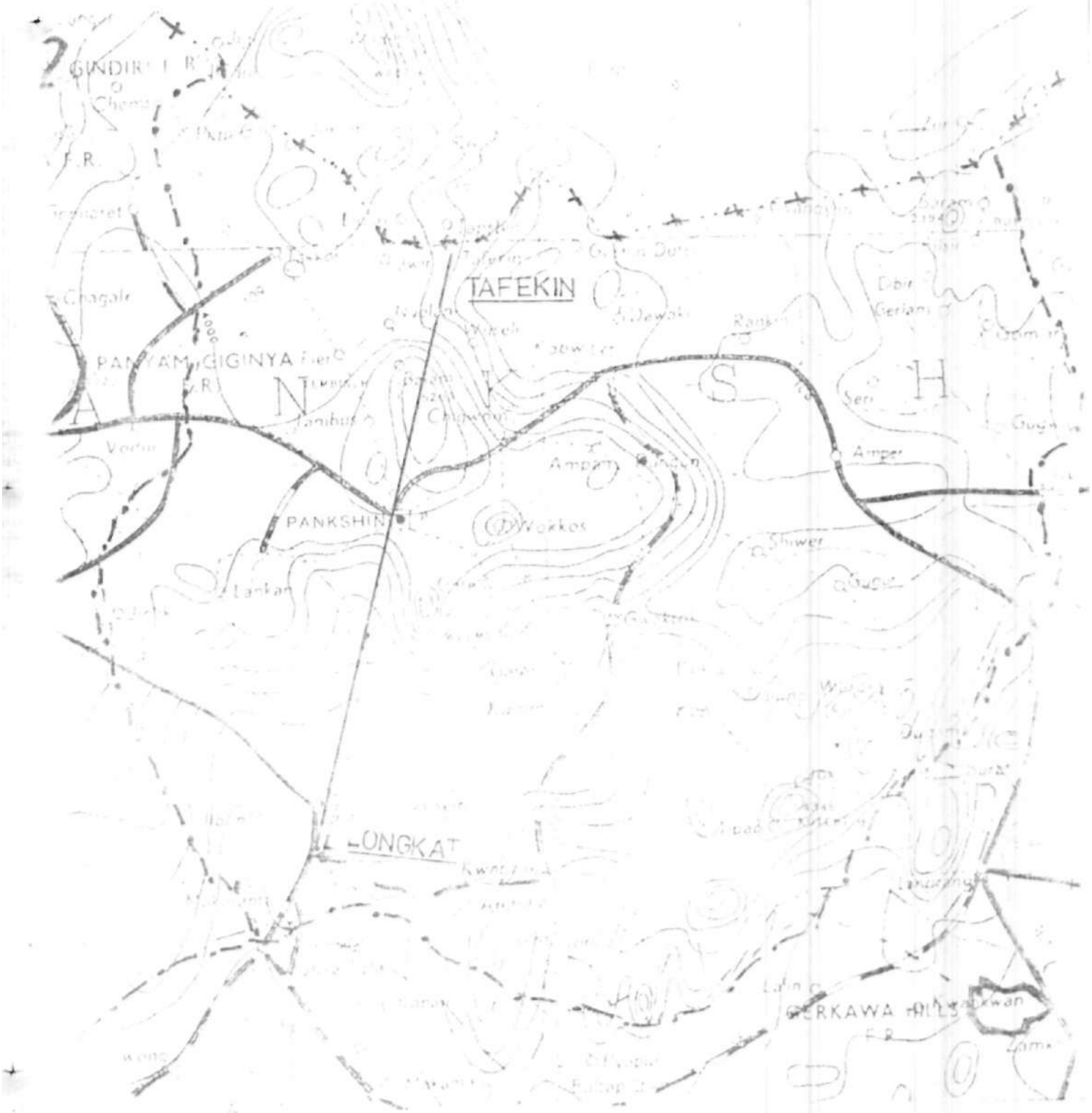
Although the cases of schistosomiasis are reported in all locations, it should be noted that more cases are reported in the Longkat clinic. The snail ecology though not found in swiftly moving waters, such water nevertheless have areas of stagnant shallows which may support numerous colonies of snails. Again

FIG.4·2 PANKSHIN LGA: A SCHEMA OF A GEOGEN



Source: Field Survey, 1988

FIG 4.2a: CROSS-SECTION FROM LONGKAT TO TAFEKIN



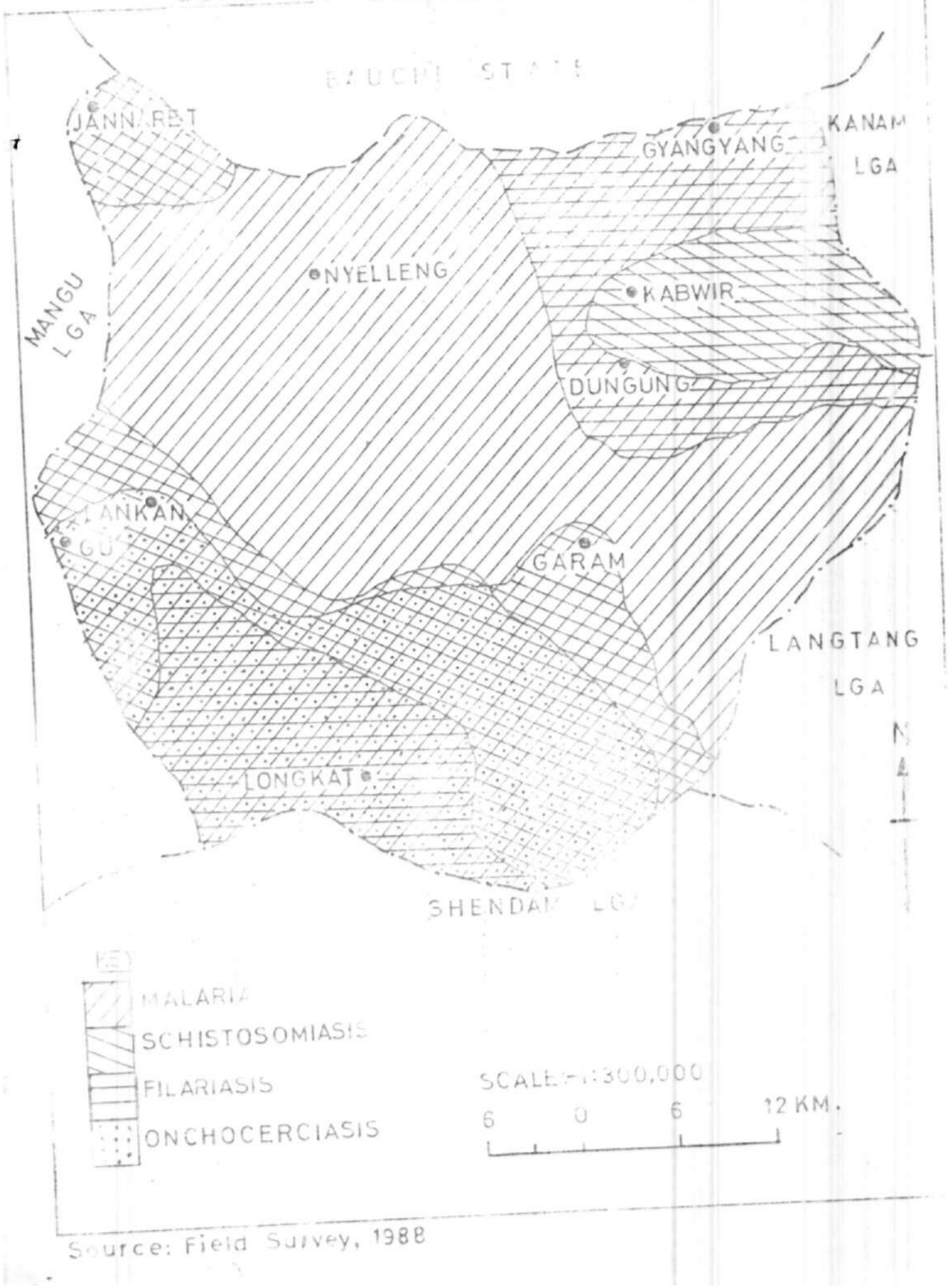
Scale 1 300,000

[illegible] part of the [illegible] where the escarpment [illegible] gently into a very flat extensive plain which was earlier referred to as the 'lowland'. These [illegible] form good environmental conditions for the habitation of snails, the vector of schistosomiasis. During the dry season the snails aestivate (remain dormant) in the mud till the pools fill again in the rainy season. Here the rural inhabitants come in direct contact with the schistosoma during farming activities especially weeding on paddy rice farms. The cases reported in areas that do not favour the snail habitation very much may be attributable to population mobility (see Fig. 4.2). Apart from localized diseases, Table 4.1 indicates that malaria cuts across the breadth and length of the L.G.A.

This discussion is to show that local epidemiological zonation can be made within the study area and it shows that the spatial pattern of diseases varies with the physiographic features of the area. This zonation is illustrated in Fig. 4.1.

4.1.2 Demographic Pattern of Health Problems

Demographic factors include age-sex distribution, birth rate, mortality and morbidity rates of all types, abortions and stillbirths, and the process of



Source: Field Survey, 1988

urbanization and population mobility. Here age is taken as one of the variables of social characteristic to demonstrate the pattern of health problems. Table 4.3 shows the pattern of health problems according to age structure in 1984 in Pankshin LGA.

Table 4.3

Pattern of Health Problems by Age Structure in Pankshin L.G.A., 1984.

Disease	Age 0-1	1-4	5-14	15+	Total
Measles	227	568	333	27	10012
Malaria	1910	3297	2777	2028	10012
Dysentery (all types)	312	189	862	841	2704
Pneumonia	209	344	277	236	1058
Whooping cough	56	139	121	47	363
Tetanus	5	17	17	12	51
Filariasis	-	10	94	209	313
Onchocerciasis	-	-	7	50	57
Schistosomiasis (all types)	26	96	234	306	661

Source: Ministry of Health, Epidemiological Unit, Jos 1987.

Table 4.3 shows that the most susceptible age-groups are those below five years and school age children of between five and 14 years. This is illustrated in Table 4.4 to show the assumption that health problems vary with age structure or some age groups are more prone to certain diseases than others.

Table 4.4

Pattern of Diseases by Age Structure

Disease	Total	Age 0-5	% of Total cases	5-14	% of Total cases	15+	% of Total cases
Measles	1155	795	68.8	333	28.8	28	2.4
Malaria	10,012	5207	52.0	2777	27.7	2028	20.3
Dysentery (all types)	2,704	1001	37.0	862	31.9	841	31.1
Pneumonia	1,098	553	52.3	277	26.2	236	21.5
Whooping cough	363	195	53.7	121	33.3	47	13.0
Tetanus	51	22	43.1	17	33.3	12	23.6
Filariasis	313	10	3.2	94	30.0	209	66.8
Onchocerciasis	57	0	0.0	7	12.3	50	87.7
Schistosomiasis (All types)	662	122	18.4	234	35.3	306	46.3

Source: From Table 4.3.

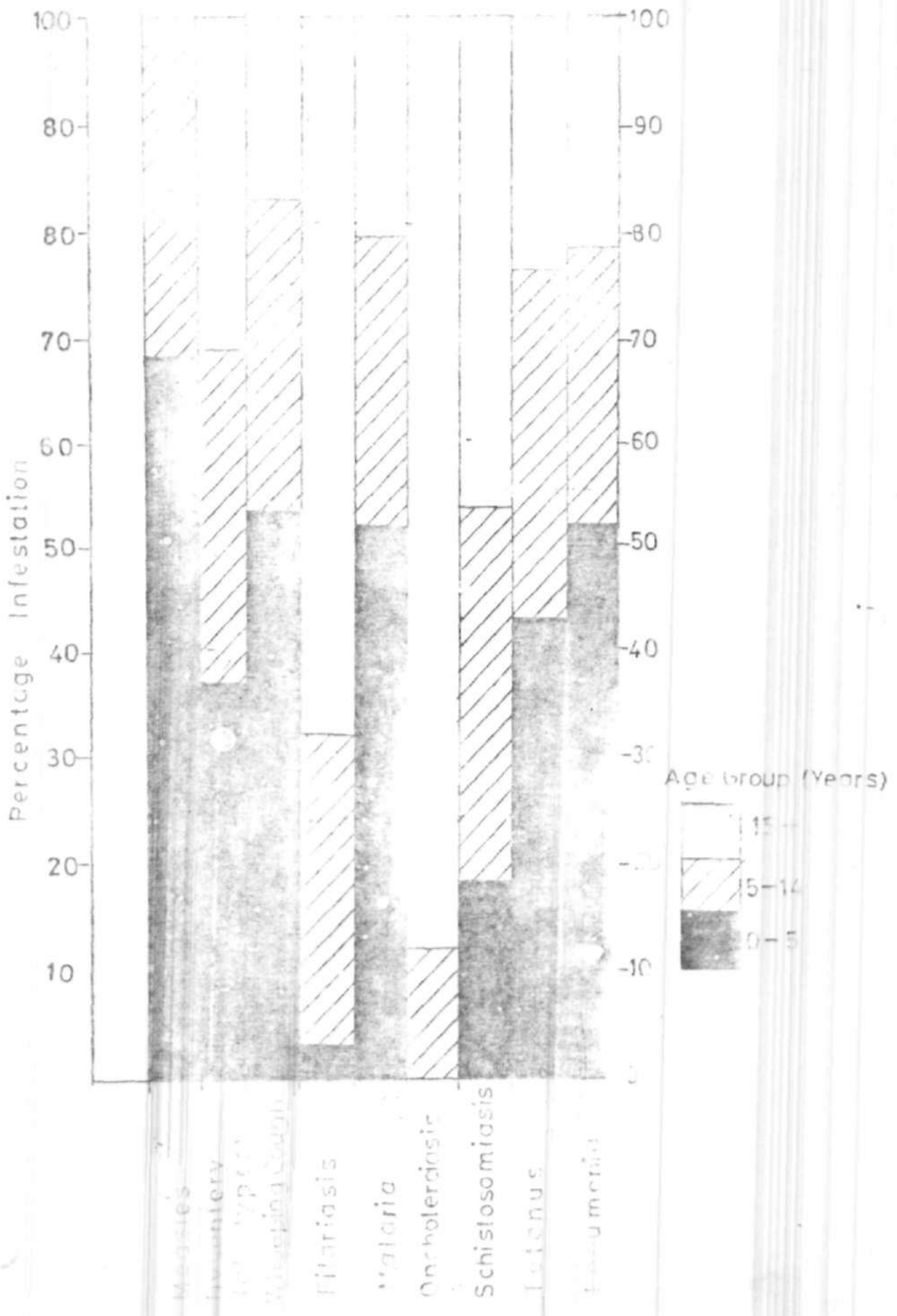
The Table 4.4 shows that the children below five years are more susceptible to measles, 68.8% malaria, 81.3%; whooping cough, 53.7%; pneumonia, 52.3%; and tetanus 43.1% than the other age groups. On the contrary, the table indicates that the rural inhabitants become more prone to certain diseases with increasing age and probably as the result of their exploration of the wider territory which brings them in contact with the environment that favours the habitation of the disease vectors. The cases reported show that the age group of 15 years and above are more susceptible to onchocerciasis, 87.7%; schistosomiasis, 46.3%; and filariasis, 66.8% than the population below the age of 15 years with 0.0% to 12.3%; 18.4% to 35.3%; and 3.2% to 30.0% respectively. This is illustrated in Fig. 4.4.

4.2 Distribution of Health Establishments

4.2.1 Hospital

The general feature in the distribution of health care services and facilities in Nigeria in general, and plateau state in particular is the unfair distribution of such amenities which is in favour of urban centres. The case in Pankshin LGA

FIG. 4.4 [illegible] OF DISEASES BY AGE STRUCTURE



is not different either. The only general hospital is located in the LGC headquarters, Pankshin town. The hospital caters, therefore, for the inhabitants within the LGA and other people outside the LGA, especially the neighbouring local government areas. As earlier discussed in Chapter Two, this hospital is to cover an area of 2334 km^2 and a population of 229,429 living in both the semi urban area of Pankshin town and the rural areas where about 95.8% of the population reside.

In terms of inputs Table 4.5 shows the avialble strength of the hospital. Generally, Table 4.5 shows a gross inadequacy and lack of the hospital personnel to cover the entire population effectively. The concern is the utilization of the hospital services by the rural inhabitants in those locations which are far away from the hospital.

The hospital inputs-population ratios are quite below the WHO standard recommended for the developing countries (WHO, 1961). For example, WHO standard for

Table 4.5

Hospital Personnel in Pankshin General Hospital

Category of Health Personnel	No	Population Per Personnel	No. of child Bearing Age Women per Mid wife.
Doctors	4	57,336	
Anaethetists	3	76,476	
Nurses	54	4,249	
Mid wives	12		3,758
Pharmacists	1	229,429	
Laboratory Technicians	4	57,336	
Theatre Attendants	7	32,776	
Radiographers	1	229,429	
Ward Attendants	52	4,412	
O.P.D. Attendants	12	19,119	
Dressers	2	114,715	
Dentists	none		
Opticians	none		

Source: Field Survey, 1985.

hospital/population ratio is 1:10,000 whereas Pankshin General Hospital is 1:229,429 or even below that because of the neigbouring LGAs that have no hospitals, and

recommended hospital service area is 800km2 while on the other hand, Pankshin general hospital is 2,334km^2 or more; the doctor-population ratio of 1: 57,336 as against recommended 1:10,000 and nurse-population ratio of 1:4,249 in contrast to the WHO's 1: 1,000.

Other inputs of the hospital include 116 hospital beds to serve 229,429 or more people i.e. 1:1978 in contrast to 1: 1,1000, and five wards to serve 229429 or more people i.e. 1:45886.

Among the various methods by which the spatial coverage of the services of a hospital may be determined, the most popular is to search the hospital records for patients' place of residence. This type of search is known as a 'patient-origin survey' (Meade 1979). This is shown in Table 4.6 for Pankshin General Hospital.

Table 4.6

Pankshin General hospital Mean Attendance (out-and in-Patients) 1983-1987 By Districts in the LGA.

District	Distance from Centroid of District (Km)	No. of Patients			Total
		Male	Female	Children	
Ampang	30	378	530	583	1491
Amper	35	678	981	762	2421
Chip	60	203	283	494	1080
Fier	14	784	1053	1409	3246
Garram	46	216	207	131	554
Kabwir	18	998	1498	801	3297
Kadun	40	531	677	311	1519
Lankan	18	587	1232	1099	2918
[illegible]	50	153	140	98	391
Pankshin	0	2005	6713	4331	13,049
[illegible]	8	130	15	120	408
Wakol	12	311	408	388	1,107
Total	-	6,974	13,980	10,527	31,481

Source: Compiled from Pankshin General hospital Attendance Register, January 1988.

The basic premise here is that rural patient patronage of a health care service is a function of their proximity to the centre. The hospital is

defined here as the centre of care, and hospital catchment areas are defined by patient movements. Onokerhoraye (1978), clearly states that distance is a major determinant of the intensity of relationships between various sets of phenomena distributed in space. As a general principle it has been stated that the greater the distance between two points the lower is the probability that those points will be functionally related.

The Spearman's Rank Correlation Coefficient technique will be used to analyse the data in Table 4.6 in order to test whether there is a correlation between the number of patients from each district and the distance between them and Pankshin general hospital (accessibility to hospital services by the majority of the rural inhabitants).

The formula for computing Spearman's Rank Correlation Coefficient is:

$$r_s = 1 - \left[\frac{6(\Sigma d^2)}{n^3 - n}\right]$$

where d^2 is the sum of the squares of the rank differences; and

n is number of pairs of ranks.

Spearman's Rank Correlation Coefficient may also be applied to data that are not originally in the form of ranks. In this case, the raw/in Table 4.6 must first be ranked in order from smallest to largest as shown in Table 4.7. For ties, the observations are assigned their average rank (Knapp, 1978).

Table 4.7

Spearman's Rank Order of Number of Patients from the Districts and Distance from Pankshin

District	Distance from Centroid of District km X	Number of Patient X	Ranked Distance X	Ranked of the Patients Y	d (x-y)	d $(x-y)^2$
Ampang	30	1491	6	6	0	0
Amper	38	2421	9	8	-1	1
Chip	60	1088	3	4	7	49
Pier	14	3241	3	10	-7	4
Garram	45	554	9	1	8	64
Kabwir	1	3297	4.5	11	-6.5	42.25
Kaoun	45	1519	8	7	1	1
Lankar	18	2910	4.5	9	-4.5	20.25
Pal	54	3511	10	1	9	81
Pankshin	1	13,049	1	12	-11	121
Ta.	85	409	12	2	10	100
Wokkos	12	1107	2	5	-3	9
					d^2 =	509.5

From Table 4.7 the Spearman's Rank Correlation Coefficient is therefore:

$$rs = 1 - \left[\frac{6 \times 509.5}{12^2 - 12}\right]$$

$$rs = 1 - \frac{3057}{1716}$$

$$rs = 1 - 1.78$$

$$rs = -0.78$$

The rs is -0.78 thus revealing a negative correlation between the two variables. This then indicates that as one tends to increase the other tend to decrease. The hospital services to the people become less effective with increasing distance.

The critical value of rs at a significance level of 0.01 is 0.671 which is less than calculated rs (ignoring the sign), it is therefore inferred that there is a significant correlation.

So be sure that this measure of agreement that "There is a variation in the distribution of health institutions and personnel in Pankshin LGA, and as such

the health care services do not effectively reach a large proportion of the rural communities" could not arise by chance, test of significance of the rank correlation coefficient may be calculated with students' t-test. This is very suitable for the data because n the number of items ranked, is not less than 10 (Moroney, 1984).

$$\text{Student's } t = rs\sqrt{\frac{n-2}{1-rs^2}}$$

with n-2 degrees of freedom (df)

$$t = -0.79\sqrt{\frac{12-2}{1-(-0.79)^2}}$$

[illegible] distance are helpful in utilization.

With these terms it is quite clear that the hospital service centre located in the urban town does not effectively reach the rural majority who are prone to the threat of diseases in their activities.

4.2.2 Maternity Clinics and Dispensaries

The study area has six government maternity clinics with nine nurses/midwives located in various parts of the LGA. Furthermore there are 18 dispensaries distributed among the district with a total staff strength of 30 dispensers.

In considering the contribution made by the missionary COCIN with the Rural Health Progtamme, there are additional six maternity clinics and seven dispensaries with a staff strength of four nurses midwives. Five dispensers and seven laboratory technician. It is therefore need that the maternity clinics have a service area of [illegible] i.e.

$$\frac{\text{Total Area (km}^2\text{) of District}}{\text{Total Number of Clinics}}$$

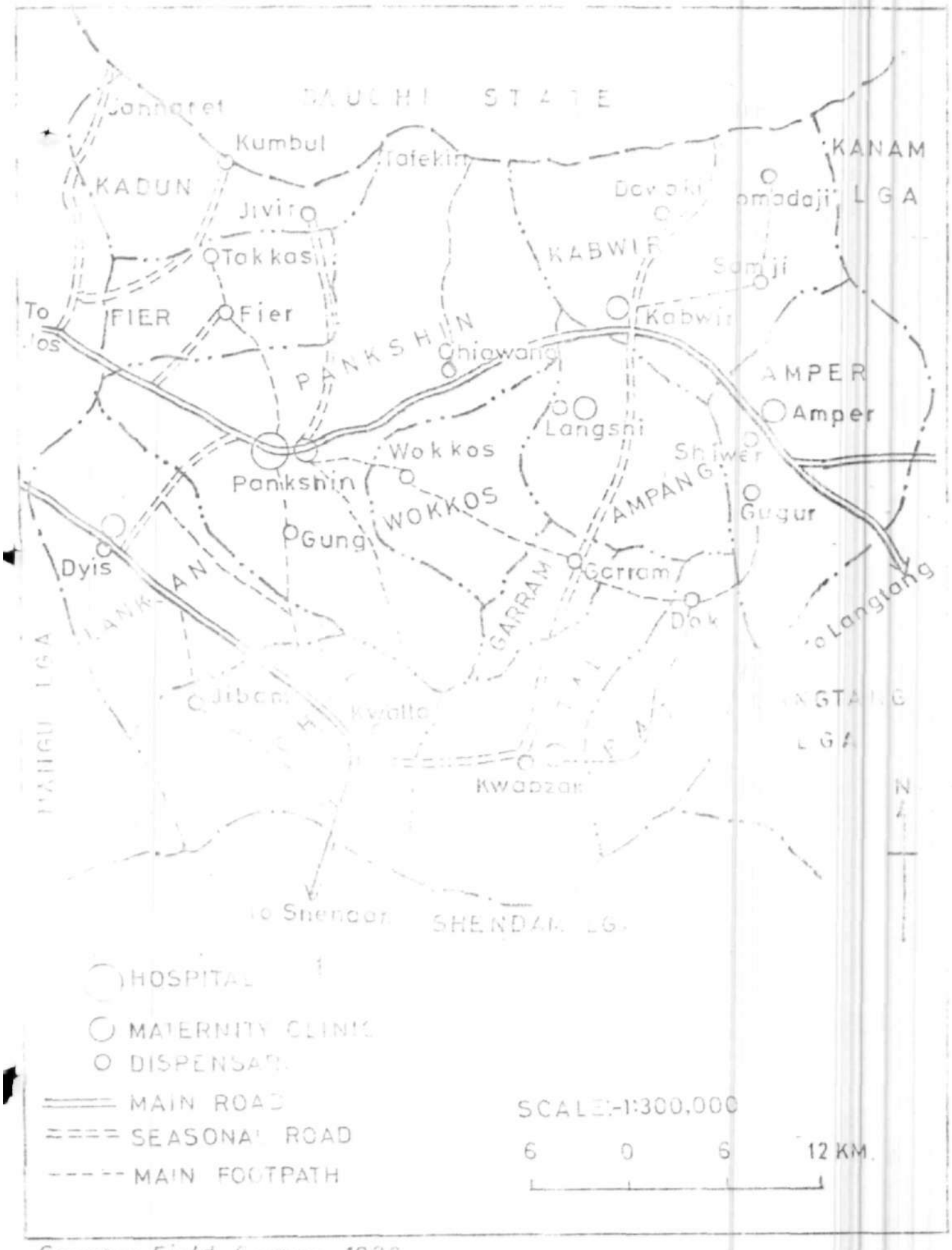
The walking radius (service radius) of a maternity clinic is 9.63km. On the other hand the dispensaries have a service area of 93.36 km^2 and a service range of 5.45km. All the maternity clinics and dispensaries seem to be very close to the WHO's standard of service range for maternity clinic as between 0-8km and dispensary as between 0-4km (WHO's Table in Onyemelukwe, 1977).

The near-convergence of the maternity clinic and dispensary service in the study area with WHO standards is deceptive because no cognizance was taken of the local variations in the topography of individual locations and transport network available in the region. Considering the harsh environment and the poor transportation network in the area, one could clearly see that the area is undeserved by these health care service centres. For instance a rural patient from Tipap on the Kutchi Hills to seek health care service at Dok dispensary another high elevation

Another perameter that needs to be considered in the provision of services by the health care centre is the adequacy of the staffing situation to cover the entire population. As already discussed in this section, there are 13 nurses/midwives, 37 dispensers and seven laboratory technicians. By implication, the ratio of a nurse to a population unit is 1: 17,648 and the

dispenser ratio to the population unit is 1:6,201 as against between 1:50 and 1:1000 recommended dispenser-population ratio. The situation therefore clearly demonstrates that even in terms of health care service personnel available to the population, the majority of the population is not covered let alone to be effective. Again this situation is further compounded by the terrain of the area.

An examination of the preceding discussion shows the distribution of the existing maternity clinics and dispensaries in the LGA. However the macroanalysis of this nature cannot provide sufficient insight into the problems related to the locational pattern of the existing health facilities in the LGA. This is because the general ratios in some cases may be very close to the WHO's standard hence a conclusion may be drawn that the population is effectively served by these facilities while they may infact be concentrated in only one part of the area. This can be visualised from Table 4.6 and Fig. 4.5



Source: Field Survey, 1988

Table 4.8

Spatial Pattern of Maternity Clinics and Dispensaries in Pankshin LGA, 1988

District	No. of Health Centre and Personnel							
	Govt/State & LGC.				Mission COCIN			
	Maternity clinic	Staff	Dispensary	Staff	Maternity clinic	Staff	Disp	Staff
Ampang	1	-	1	3	-	-	1	1
Amper	1	1	2	2	-	-	-	-
Chip	-	-	2	3	1	2	-	-
Fier	-	-	2	4	-	-	1	1
Gashiram	-	-	1	2	-	-	1	1
Kabwir	1	2	3	5	-	-	2	2
Kadun	-	-	1	2	1	2	-	-
Lankan	1	1	-	---	-	-	2	2
Pai	-	-	1	1	-	-	-	-
Pankshin	1	4	3	4	-	-	-	-
Tal	1	1	1	1	-	-	-	-
Wokkos	-	-	1	2	-	-	-	-
Total	6	9	18	29	2	4	7	7

Source: Field survey, 1988.

4.2.2 Immunization Activity

A person who is immune to a disease is one who is protected against that disease by means of antibodies circulating in his blood or present in the cells of the tissues of his body (Stanfield, 1985). Immunity may be passive or active. Passive immunity is where the antibodies may be given to the person ready-made. For babies the most important source of antibodies is breast milk, colostrum in particular contains large amounts of antibodies which remain within the baby&s intestine, coating the surface of the lining cells and not being absorbed (Stanfield, op cit). Thus they prevent bacteria and viruses from sticking to the lining of the intestines and finding their way into the cells and bloodstream. This is the reason why breast-fed babies suffer much less from diarrhoea and other infectious diseases.

On the hand, active immunity is what the person makes his own antibodies. In order to start the production of antibodies, it is necessary for the person to be infected with the disease or given a vaccine which contains the bacteria or their products in a harmless form - the active immunization.

[illegible] ion [illegible] the [illegible] increasing specific antibody in the tissues.

Massive immunization activity started in Pankshin in January 1986. This is the preventive aspect of the health care delivery system. The ultimate aim has been to induce active immunity in children between less than one month to 24 months and expectant mothers in the LGA.

Since its inception in 1986 the immunization unit-Expanded Programme of Immunization Unit, Pankshin has been able to vaccinate only 4776 children. The spatial coverage of the immunization activities is shown in Table 4.9.

Table 4.9

Immunization Coverage in Pankshin LGA January 1986-December 1987 All Types (*BCG, DPT_3, $Polio_3$ TT_2 and Measles).

District	Targeted Popn	Total Popn Vaccinated	% of Total Popn. Vaccinated
Ampang	1866	155	3.2
Amper	4025	752	15.8
Chip	2553	150	3.1
Fier	1681	345	7.2
Garram	1449	59	1.2
Kabwir	4936	752	15.8
Kadun	1297	75[illegible]	3.2
Lankan	2853	160	3.3
Pai	548	46	1.0
Pankshin	7770	1979	41.6
Tal	903	68	1.4
Wokkos	1087	156	3.2

Source: Compiled from E.P.I. Unit, Pankshin, Jan. 1988

* BCG = Bacilus-Calmetle-Guerine, antituberculosis

DPT_{3+} = Diphtheria

$Polio_{3+}$ = Poliomyelitis

TT2+ = Tetanus

+Number indicates that only the dose given up to the number shown at intervals of weeks or months that the vaccines become effective in the person. While BCG and measles vaccines are given only once and

[illegible]

Table 4.9 indicates that the EPI vaccination activities have been more concentrated in certain locations than the peripheral areas. The percentages calculated from the data compiled from the EPI Unit, Pankshin show that out of the total population vaccinated, Pankshin district alone has 41.6%, Amper and Kabir Districts have 15.8% each, and Fier District 7.2%. It is interesting to observe that these districts are either close to Pankshin town or have all season roads linking the main settlements within such districts and the EPI Unit, Pankshin town. Though data are not available on the distribution of the population innoculated within each district, it is quite obvious to infer that the hamlets and farmsteads that are remote from any access roads are not affected by such health preventive measures for the under-fives and expectant mothers.

When interviewed, the personnel complained of poor transport network as one of them said, "There is need to have one bicycles each to enable us to cover the villages that are not motorable" (Field Interview, January, 1988). Apart from the problem of transformation, the unit lacks cold chain equipment and cold boxes to store and carry the vaccines to the remote areas. The potency of such vaccines requires efficient storage facilities and careful handling.

A statistical test may be used to establish whether immunization activities have been concentrated in certain locations as shown in Table 4.9 using distance from the headquarters to the various district headquarters. To determine the spatial pattern of the immunization exercise to cover the targeted population irrespective of geographic location of the people Spearman's Rank Correlation Coefficient is used to test the assumption that the preventive health services (immunization) do not effectively cover a large proportion of the rural inhabitants.

Table 4.10

Spearman's Rank Order of Vaccinated Persons From Each District and Distance from Pankshin

District	Ranked Distance from Centroid of District to Pankshin X	Ranked Number of Vaccinated Persons in each District Y	d (x-y)	d^2 $(x-y)^2$
Ampang	6	6	0	0
Amper	7	10.5	-3.5	12.25
Chip	11	4	7	49
Fier	3	9	-6	36
Garkan	9	2	7	49
Kabwir	4.5	10.5	-6	36
Kadun	8	5	3	9
Lankan	4.5	8	-3.5	12.25
Pai	10	1	9	81
Pankshin	1	12	-11	121
Tal	12	3	9	81
Wokkos	2	7	5	25

$\Sigma d^2 = 511.5$

Formula for Spearman's Rank Order is

$$rs = 1 - \left[6 \left(\frac{\Sigma d^2}{n^3 - n} \right) \right]$$

$$rs = 1 - \left[\frac{\quad}{12^3 - 12}\right]$$

$$rs = 1 - \left[\frac{3065}{172^3 - 12}\right]$$

$$rs = 1 - \frac{3065}{1716}$$

$$rs = 1 - 1.79$$

$$rs = -0.79$$

The calculated rs is -0.79 and the critical value of rs for N=12 at the 0.01 level of significance is 0.6713 or at 0.005 level of significance is 0.7273. The critical values of rs at these levels of significance are less than the calculated rs (ignoring the sign), it is concluded that the immunization activities tend to reduce with increasing distance from the EPI Unit at Banksnir. To be sure that this correlation could not arise by chance, a test of significance of the rank correlation coefficient may be calculated with student's t-test. This is quite suitable for the data because n, the number of items ranked, is not less than 10.

$$\text{Student's } t = rs\sqrt{\frac{n-2}{1-rs^2}}$$

with n-2 degrees of freedom ..f.)

$$t = -0.79\sqrt{\frac{12-2}{1-(-0.79)^2}}$$

$$= -0.79\sqrt{\frac{10}{1-0.62}}$$

$$= -0.79\sqrt{\frac{10}{0.38}}$$

$$= -0.79\sqrt{26.32}$$

$$= -0.79 \times 5.13$$

$$= \emptyset -4.05$$

The critical value of t with df = n-2 = 10 at 0.01 level of significance is 2.764 or even at 0.005 level of significance is 3.1693. The calculated t is greater than the critical value therefore there is a relationsh between distance and preventive health services coverage.

To further confirm the over concentration of the preventive health services in certain locations at the expense of others, a localization coefficient test is therefore used for the data in Table 4.9. This is a measure of relative regional concentration of a given health care service compared to the total of the targeted population in the area. This coefficient is essentially a measure of the deviation from the equ

distribution of the services is the 'localization curve' as shown in Fig. 4.6. An localization coefficient, when the value of the coefficient is zero, it means complete geographic association exists i.e. the services are evenly distributed according to the geographic distribution of the population; when the coefficient is one, it therefore dpicts that there is no geographic association i.e. the services are concentrated in certain locations of the region irrespective of the geographic distribution of the population (Isard, 1971; and Hammond and McCullagh, 1978).

The first procedure involves ranking the districts according to the vaccinated population and secondly plotting on a cumulative percentage basis, Table 4.11 and Fig. 4.6.

FIG. 4.6: PANKSHIN LGA: LOCALIZATION CURVES FOR IMMUNIZATION 1986--1987

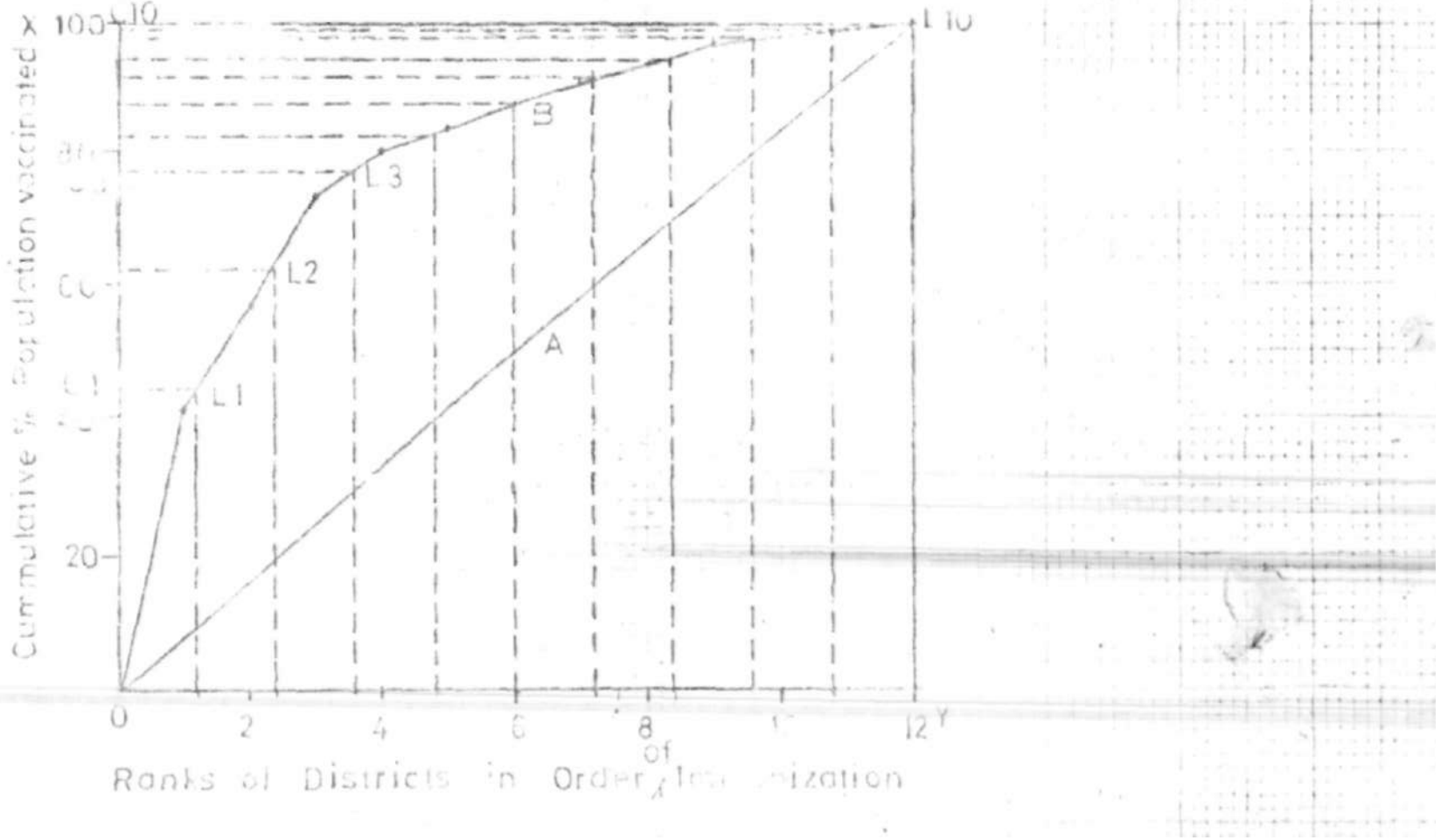


Table 4.3

Ranks of Districts According to Vaccinated Population in Pankshin LGA

District	Ranks	% of Total Pop. Vaccinated	Cumulative % of Total pop. Vaccinated.
Pankshin	1	41.6	41.6
Amper	2	15.8	57.4
Kabwir	3	15.8	73.2
Fier	4	7.2	80.4
Lankan	5	3.3	83.7
Ampang	6	3.2	86.9
Wokkos	7	3.2	90.1
Kadun	8	[illegible]	[illegible]
[illegible] Chip	9	[illegible]	96.7
Ta[illegible]	10	[illegible]	97.8
Ga[illegible]ar	11	[illegible]	99.0
Pa[illegible]	12	[illegible]	100.0
Total		100.0	

Source: From Table 4.2

The localization curve is constructed from the sets of cumulative percentage of the populated vaccinated on the vertical axis (X) and ranked districts on the horizontal axis (Y) as shown in Fig 4.6.

Further in Fig. 4.6 the diagonal line (A) is the line of even distribution while the localization curve (B) depicts the cumulative percentages of the vaccinated population in the various districts. If the vaccination in each district had been equal, the localization curve (B) would have been a straight line overlapping the line of even distribution (A). But where certain districts have more population vaccinate than others, concentration in those areas would be shown by the increasing size of the area contained between lines A and B. This is the conclusion we draw about the spatial coverage of the immunization exercise in Kaduna for Jan. 1986-December 1987 from a visual interpretation of the localization curve.

Localization coefficient index can then be calculated mathematically from Fig. 4.6 using the following formula and procedure.

Formula

$$I = \frac{C - L}{1000 - L}$$

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where, 1000 is the conditions of the extreme of inequality

I is the index of localization

C is the vaccinated cumulative percentage total

L is the district cumulative percentage total.

and the procedures are:

(i) mark off ten equally spaced points along the horrizontal axis (Y);

(ii) project vertically from these points to the localization curve at L1, L2 ..... L10;

(iii) Project from L1, L2..... L10 to the vertical axis (X) at C1, C2, ... C10, and note the values of C1, C2 etc on the vertical scale;

(iv) add the ten values C1, C2 ... C10 to give C in and then add L1, L2 ...L10 to give L in the formula above.

Thus the localization coefficient from Fig. 4.6 is C1 + C2 + C3 ... + C10 = 832.5

L1 + L2 + L3 ... + L10 = 550

$$I = \frac{832. - 550}{1000-550}$$

$$= \frac{282.5}{450}$$

$$= 0.63$$

The localization coefficient is therefore 0.60 which is greater than Zero, it would then be strongly concluded that the preventive health care services (immunization) do not cover the targeted population irrespective of their geographic locations. This situation has been demonstrated by the Spearman's Rank Order Correlation Coefficient and Student's t statistical tests.

4.2.4 The Spatial Pattern of Traditional Health Care Homes

The traditional health care system in Nigeria in general and in Pankshin LGA in particular can be perceived as the approach of any indigenous community to disease and illness. It embraces, as discussed earlier, medical taxonomy, local 'pharmacology' for decoction, folk knowledge, traditions and values, and supportive social institutions and identified personnel. This is a reflection, of the varying socio-cultural characteristics of the people in different parts of the LGA.

In the first place, health care begins with the perception and acceptance of the role of being ill either by the individual or his associates and reactions to sympotomologies are culturally influenced

(Onokerhoraye, 1984). The traditional concept of disease causation in the area includes beliefs in natural or God-sent illness and in supernatural forces. These include witchcraft ghosts, spirit disturbance, the breach of a taboo, and failure to observe kinship rules or religious obligations. This concept of the causes of illness influences the mode of treatment applied and the specialists - herbalists who use mainly herbs in healing practices, cult healers - who deal with witchcraft and disasters and a host of others.

Another set of specialization in the traditional medicine in the area is surgery. There are some traditional medical practitioners who are specialists in circumcision, making of traditional marks ('tribal marks'), removal of uvula (a tag-like structure hanging down from the free edge of the soft palate when inflamed, and bone setting.

The traditional practitioners are scattered in the area and are known only in their local domiciles. The delivery of such services is carried out on a part-time basis by the practitioners. Nevertheless there are some well-known bone setters and birth attendants in the study area who attend to a clientele drawn from different parts of the LGA and even from

outside the LGA. Knowledge of the location of the traditional health care homes is highly restricted to those who have on any occasion being treated by such practitioners, and probably to their immediate neighbours in that community.

Infant mortality and maternal mortality are closely related and the group, especially infants are the most affected by the various diseases found to be prevalent in the study area. The next chapter looks at infant mortality and maternal mortality in the study area and the social, economic and environmental characteristics that may be associated with their incidence.

CHAPTER FIVE

SOCIO-ECONOMIC AND ENVIRONMENTAL FACTORS AND THE HEALTH STATUS IN RURAL AREAS IN PAKISTAN.

At the beginning of this study some hypotheses were postulated. In this chapter the data collected from the surveys carried out will be analysed for the purpose of further testing of these hypotheses. In chapter four some statistical tests have been used to determine the spatial distribution of health care services and facilities in the area and the geographic pattern of diseases. This chapter is therefore divided into four sections in order to further test the assumptions made earlier. These sections are the socio-economic background and demography of the rural communities in relation to their health status; secondly, environmental factors affecting the health conditions of the people; thirdly, health care services accessibility in terms of the socio-economic status of the rural inhabitants; and fourthly, the patronage of traditional health care system.

5.1 Socio-economic background and demography

Many social factors are related to the health and diseases of a population group. It is known that the prevalence and rate of incidence of many illness

vary from one social group to another. Different social groups have different disease patterns. A variety of diseases are associated with socio-economic status. The utilization of the health care services varies not only according to social psychological characteristics of the individuals, but also according to such social factors as social class and education. The way in which people deal with illness is closely related to the ideas about ~~xxxx~~ cause and aetiology which vary from one society to another.

5.1.1 Household Composition

A household in the study area consists of the head of household, his wife/wives, his children still living with him, and other relatives, young or old. This study reveals that 7.0% of the heads of household interviewed were widowed, 5.7% had no wives due to divorce and 87.3% were married. Among the married heads of household interviewed 34.6% had more than one wife each as shown in Table 5.1.

Table 5.1

Marital Status

No. of Wives	Respondents	% of Total Respondents
0	26 (0)	12.7
1	108 (108)	52.7
2	33 (66)	16.1
3	21 (63)	10.2
4 and above	17 (68)	8.3
Total	205 (305)	100

Actual number of wives in brackets

Source: Field survey, 1988,

The number of children per household ranges from zero to 15. The number of children per wife therefore is 4.9. This is shown in Table 5.2.

Table 5.2

Mean Number of Children Per Household

No. of children	Respondents	% of total respondents
0-5	78	38.0
6-10	56	27.4
11-15	71	34.6
Total	205	100.0

Source: Field survey, 1988

The data on household composition and size further reveals that the household size ranges from one person to over 25 members in each household. This situation is shown in Table 5.3.

Table 5.3

Household Size

No of persons per Household	Respondents	% of Total Respondents
1-5	60	29.3
6-10	47	22.9
11-15	14	6.8
16-20	7	3.4
21-25	77	37.6
Total	205	100.0

Source: Field survey, 1986.

Table 5.3 reveals that each household has an average of 11.5 persons in it. The implication of the household size on health status is the room occupancy ratio in case where toilet facilities are not adequately provided by respective household. This also may have some impact on the diet and other facilities in the household.

The sample survey also considers the mortality rates among the households. This survey shows that infant mortality, i.e. children that died before two years old, ranges from one to above six in the sampled households, as indicated in Table 5.4. Table 5.4 clearly indicates that 16.4% of the households have infant deaths between four and six and 38.0% have infant mortality of over six deaths.

Table 5.4

Infant Mortality (Two Years and Below)

No. of Infant Death	Respondents	% of Total Respondents
0-3	93	45.4
4-5	34	16.4
Over 6	78	38.0
Total	205	100.0

Source: Field survey, 1987

The study further establishes that about 37.1% of the households have child mortality, i.e. children that died after two years old, between zero and three, while 62.9% (129 households) have child mortality of between four and six per household.

5.1.2 Diet

The local diet is rich in carbohydrates and poor in protein. These staples include guinea corn, millet, maize, rice and acca. Meat, fish and eggs are scarce and eaten in small quantities only and protein rich vegetables do not form significant part of the staple food. The sample survey gives some information on the pattern of protein-intake among the members of the households. The information reveals some significant disparity in egg consumption among the members of the household as shown in Table 5.5.

Table 5.5

The Pattern of Egg Consumption Within Household

Category of Household Members	Respondents	% of Total Respondent
Head of Household only	105	51.5
Elders only (Husband and wife)	84	41.2
All members of family	16	7.8
Total	205	100.0

Source: Field survey, 198

Further on protein consumption the sample survey shows that meat is mostly consumed on special occasions such as traditional festivals, Christmas [illegible] and Sallah, while only 30.7% of the sample group indicate that meat is taken at any time. This pattern of protein consumption is therefore associated with the cases of diarrhoea and gastroenteritis which interfere with the absorption of nutrients and hence lead to malnutrition in children as reported in some maternity clinics and dispensaries in the study area in 1987 as shown in Table 5.6.

Table 5.6

Reported Cases of Diarrhoea and Child Malnutrition in 1987

Location of Clinic/Dispensary	Diarrhoea Under 5 yrs	Diarrhoea Adult	Child Malnutrition
[illegible]	[illegible]	[illegible]	128
[illegible]	[illegible]	[illegible]	17
[illegible]	[illegible]	[illegible]	8
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	118
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	148
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	41
[illegible]	[illegible]	[illegible]	2
[illegible]	[illegible]	[illegible]	697

Source: Compiled from CUCIN, Rural Health Programme Headquarters, Ponyam, January, 1988.

With regards to infant mortality as one of the major health problems in rural area, it is assumed that a relationship would exist between the infant mortality and protein consumption pattern in the study area. In this respect it is hypothesized that the major health problems are related to the socio-economic status of the rural communities. To test if any significant relationship exists between the data on infant mortality and the protein consumption habits and pattern (Table 5.7) is analysed by using the chi square statistic (X^2).

To calculate chi square (X^2) the following formulae are used

(i) $E = \frac{C \times r}{G}$

where E is the expected frequency

C is the column total

r is the row total

G is the grand total of sample

(Field survey, 1986).

(ii) $X^2 = \sum_{i=1}^{k} \frac{(Oij - Eij)^2}{Eij}$

where k is the number of categories

oij is the observed frequency in category i of sample j, and

Eij is the expected frequency in category i of sample j.

and (iii) df = (r-1) (c-1)

where df is the degree(s) of freedom

r is the number of rows in the contigency table, and

c is the number of columns in the contigency table.

The chi square test requires that

(a) the observations should be classified into at least two mutually exclusive categories,

(b) if only two categories are involved, the expected frequency in each category should not be less than five, and

(c) where more than two categories are involved not more than one category in five should have an expected frequency of less than five (Norcliffe, in Ardyn, 1976, p. 85).

Table 5.7

Infant Mortality and Protein Consumption Pattern

No. of Infant Deaths	Protein Consumption: Only on special Occasion	Protein Consumption: More Frequent	Row Total
1-3	71	22	93
4-6	28	8	34
Above 6	45	33	78
Column Total	142	63	205

Source: Field Survey, 1988

Table 5.8

Computing X^2 Value of Infant Mortality and Protein Consumption Pattern

Oij	Eij	(Oij-Eij)	$(Oij-Eij)^2$	$\frac{(Oij-Eij)^2}{Eij}$
71	64.4	6.6	43.56	0.68
22	28.6	-6.6	43.56	1.52
28	23.6	2.4	5.76	0.24
8	10.4	-2.4	5.76	0.55
45	54.0	-9.0	81.0	1.94
33	24.0	9.0	81.0	3.38
205	205			7.87

Source: From Table 5.7

$$X^2 = \sum_{i-1}^{k} \frac{(Oij-Eij)^2}{Eij} = 7.87$$

It can be seen in Table 5.6 that all categories have an expected frequency (Eij) higher than five so that all the requirements of the X^2 test outlined earlier have been met. The significance distribution given in Table 5.7 is K = df = (r-1) (c-1) = (2-1) (3-1) = 1 or two degrees of freedom. With two degrees of freedom the critical chi² square value at 0.05 level of significance is 5.99. This critical value is much smaller than the computed X^2 value therefore there is enough evidence to accept the hypothesis that there is a strong relationship between infant mortality and protein consumption pattern in the rural area and of the latter is dictated by the low socio-economic status of the rural inhabitants.

5.1.3 Literacy Level

Education has made some progress during the recent years in the study area generally. Despite this penetration of western education, there is quite a large number of the sampled population that is still at the illiteracy level. Table 5.9 shows the literacy level in the rural areas.

Table 5.9

Literacy Level in Rural Areas

Literacy Level	Respondents	% of Total Respondents
Illiterate	168	57.6
Literate	87	42.4
Total	205	100.0

Source: Field survey, 1988.

The role of literacy in health system is very critical because education brings ih innovation in such a way that leads to change in personal behaviour. This change results in areduction in mortality, or morbidity through improvement in environmental sanitation personal hygiene, nutritional level and disease control. It is pertinent to postulate that there is an association between the level of literacy and health status of the rural dwellers. Here infant mortality is correlated with the level of literacy of the sampled population.

To test the relationship between literacy level and infant mortality X^2 statistic is used to analyse the data in Table 5.9 as shown in Table 5.10.

Table 5.10

Observed and Expected Size Frequencies of Literacy Level and Infant Mortality

No of Infant Deaths	Literacy level Non-Literate	Literate	Row Total
1-3	67 (53.5)	26 (39.5)	93
4-6	24 (19.4)	10 (14.4)	34
Above 6	27 (44.9)	51 (33.1)	78
Column Total	118	87	205

Expected size frequencies are in brackets.

Source: Field survey, 1988.

Satisiying the necessary X^2 statistic requirements and using the same procedure as in Table 5.8, the computed $X^2 = 27.16$, critical $X^2 = 5.99$ at 0.05 level of significance (P.) with two degrees of freedom (df). This critical value is much smaller than the calculated X^2 value, therefore it established that there is a strong association between the level of literacy and health conditions of an individual or a community.

It can therefore be inferred that child care varies with the level of literacy and that the children of the non-literate sampled population were perhaps more exposed to health hazards than those of the better educated families. This situation could be

through poor environmental sanitation, unsafe water used in the home, and even poor food preparation for the child, the level of accessibility to other health care services that would promote the health status of the individual, family or the community.

Literacy level is again used to establish whether there is any association between it and child mortality, i.e. children that died after the age of two years, or not. The chi square statistic is used to analyse the data obtained from the field survey as shown in Table 5.11.

Table 5.11

Observed and Expected Size Frequencies of Literacy Level and Child Mortality

No of Child Death	Literacy Level: Non-Literate	Literate	Row Total
0-3	57 (43.7)	19 (32.3)	76
4-6	61 (74.3)	68 (54.7)	129
Column Total	118	87	205

Source: Field survey, 1987

Computed X^2 = 13.92, critical value at 0.05 level of significance with 1 df = 3.84.

Since the calculated x^2 is much more than the critical value, it is concluded that there is a strong association between the level of literacy and child mortality also.

In this study, other variables of the socio-economic types of the sampled population are to be tested. These variables include the level of occupation and income. For the purpose of this analysis the chi square statistic (X^2) is used and the respondents are divided into two categories of occupation levels, i.e. primary (farming, rearing) and secondary (trading, civil service, etc) as indicated in Table 5.12.

Table 5.12

Observed and Expected Size Frequencies of Occupation and Infant Mortality

No. of Infant Deaths	Occupation Level: Primary	Secondary	row Total
1-3	8[illegible] (79.8)	[illegible] (13.2)	[illegible]
4-6	29 ([illegible].1)	13 (5.9)	42
Above 6	59 (58.1)	11 (9.9)	70
Column Total	176	29	205

Source: Field survey, 1986

All the requirements of Chi square are met, and using the same procedures the calculated X^2 = 20.52, critical value at 0.05 level of significance with 2df = 5.99. The computed X^2 is much larger than the critical value therefore there is a very strong association between the type of occupation and infant and child mortality. The test confirms the assertion that during the labour peak for agricultural activities children are less cared for by the parents, breast milk output decreases, nutritional status of staples deteriorates, and health care services are least sought for. Consequently children in to the low occupation group are more exposed to infections hence malnutrition and diarrhoeae diseases take their toll on these children than those children in the higher occupation group.

To test relationship between income level and infant mortality, Chi square statistic is used as illustrated in Table 5.13.

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Table 5.1

Observed and expected Size Threshold of Income Level and Infant Mortality

Infant Deaths Per Household	Income level (N) 200	200-499	500-799	800-1199	
1-3	57 (48.1)	26 (27.1)	6(5.1)	5 (3.7)	99
4-6	14 (17.7)	16 (10.1)	3(3.3)	1 (2.8)	34
Above 6	36 (40.7)	19 (15.8)	12 (7.6)	11 (6.5)	78
Column Total	107	61	20	17	205

Source: Field survey, 1988

Calculated X^2 = 16.77, 6df., P.0.05 = 12.59

Although there are two expected values that are less than five but one of the requirements is that where more than two categori-s are involved, not more than one category in five should have an expected frequency of less than five, but in this table it is one in six, hence the requirements are met, and using the same procedure. Since the computed X^2 is much more than the theoretical value it is strongly established that there is an association between income level and infant mortality which is an indicator of health problem in any community. It can be concluded from this test that the better the income level the less the health problem in that household or community. Further to this association

in the rural children of high income group who will eat the required diets whereas on the other hand the low income group do not have the means to have balanced diet for their children except the re-convertible the family takes everyday. Again if baby formulas are introduced in the feeding of babies in the low income group there is the problem of getting the means to purchase the required quantity on a continued basis and the concomitant hygiene requirements for maintaining the quality of the baby foods and also free from germs.

A general inference can be drawn from these tests and percentages that the socio-economic background and demographic factors of an individual, family or community in the rural areas, have very strong association with the health status of that community which could be positively i.e. promoting better health conditions or negatively i.e. creating more health problems. The level of awareness of the health problems also increases with improved socio-economic status.

5.1. Environmental Factors

This section seeks to establish some relationships between environmental factors (housing, waste disposal

and sources of water supply) and health conditions of the rural communities in Rankshir Ltd. Generally, many of the houses in the rural areas are built according to traditional patterns and from materials locally available, such as mud bricks and roofed with grass. Many of the houses are one room hovels where ventilation and light seem inadequate; floors are dirty and muddy in the rainy season, roofs are low; and there is considerable overcrowding. Environmental sanitation is frequently unsatisfactory. Methods of disposal of human wastes and other household refuse are unsafe, water supply unwholesome, and in general the health of the rural inhabitants is in danger indeed. Those environmental factors necessary for the physical, mental, and social well-being of the rural communities are commonly lacking.

The sample survey reveals that the room occupancy ratio ranges from one person per room to four persons per room among the households as shown in Table 2.14.

No. of Persons per room	Respondents	% of total Respondents
1	51	24.9
2	104	50.7
3	41	20.0
4	9	4.4
	205	100

Source: Field survey, 1988.

Table 5.14 clearly indicates that there is the problem of overcrowding in the rural areas and the result is poor ventilation which can aid an outbreak of airborne diseases. Health problems arising from poor housing system include measles, tuberculosis, scabies (craw-craw); and broncho-pneumonia arising from indoor smoke pollution and dust. There have been cases of measles and pneumonia reported in the various CONCH rural clinics and other health centres sampled for this study (see Table 4.2).

In considering the method of waste disposal the sample survey reveals that 71.2% use bush as their latrine, 27.3% use pit-latrine and 1.5% use water-seal latrine. The resultant effect of using the bush syste

is that [illegible] by the infected members of the rural communities will find their way to other people within the locality or back to the infected person again. These diseases can be contracted during agricultural activities on the farms or the germs are washed into the sources of water supply.

Health problems (diseases) associated with poor excreta disposal system include amoebiasis, schistosomiasis, intestinal helminthiasis or ascariasis i.e. hookworms, tape worms, thread worms, and round worms; and some other diarrhoeal diseases. These cases have been reported in various medical centres sampled for this work in the study area. This situation can lead to prolonged debility, disability and mortality in both children and adults.

Table 5.15

Cases of Health Problems (Diseases) Associated with Housing and Toilet Systems, 1987

Location of clinics/Disp.	Cases of Health Problems				
	Housing System			Toilet System	
	Measles	Pneumonia	Amoebiasis	Schist.	Helminth
Kabwir	5	846	158	130	413
Dungun	6	237	55	3	45
Garram	12	256	11	23	295
Nyelleng	11	141	78	36	264
Gyangyang	42	186	93	20	52
Jannaret	91	189	18	51	150
Longkat	21	568	152	491	306
Kagu	46	75	80	172	87
Lankan	–	153	101	110	58

Source: Compiled from UCIN Rural Health Programme, Panyam, January, 1986.

At this juncture we would investigate any association which might exist between the diseases reported in these health centres and the environmental conditions of the rural communities. This will be done using the chi square technique to analyse the data on infant mortality and toilet systems which pose various environmental health problems as reported in the various health centres (Table 5.15).

Table I.16

Observed and Expected Cell Frequencies of Infant Mortality and Toilet System

No of Infant Deaths	Bush	Toilet System Pit/Water-Seal	Row Total
1-3	73 (67.4)	20 (25.6)	93
4-6	30 (26.7)	4 (9.3)	34
Above 6	46 (54.9)	32 (21.3)	78
Column Total	149	56	205

Source: Field Survey, 1988

Calculated X^2 = 12.71, 2df., P. 0.05 = 5.99

The result shows that there is a satistically significant association between infant mortality and toilet system since the critical value of X^2 is much smaller than the computed value. It can therefore be inferred that there is a strong relationship between the health problems (diseases) and the environmental conditions of the rural communities.

A visit to Wolle Cooperative by the study makes some sanitary survey of the bathing places of the rural inhabitants. The survey shows that 56.6% of the sampled households have their bath in streams, ponds or rivers which are also sources of water for domestic

purposes, w[illegible]40.4% h[illegible] temporary bathing places made of grass and 5.4% have bathrooms within the compounds.

With respect to the sources of water for domestic uses 80.5%, of the sampled households use either streams, rivers, or ponds which in most cases dry up during thedry season, 14.1% have wells (shallow ones indeed) and 5.4% have pipe-borne water i.e. those in Panksnin town only. An unwholesome source is known to cause over 80% of all diseases in the developing countries, as this assertion is confirmed by the cases reported in the sampled health centres, Table .15 under toilet system. Chi square is used to test the assertion that unsafe water supply is one of the major environmental factors that is attributable to the health problems of rural communities. To confirm the test infant mortality and sources of water supply used as variables, Table 6 p.17.

Table 5.17

Observed and Expected Frequencies of Infant Mortality and Sources of Water Supply

No. of Infant Deaths	Source of Water Supply: Stream/Ponds	Well, Pipe	Row Total
1-3	41 (45.9)	16 (11.1)	57
4-6	92 (83.7)	12 (20.3)	104
Above 6	32 (35.4)	12 (8.6)	44
Column Total	165	40	205

Source: Field survey, 1988.

Calculated X^2 = 8.56, 2df., P. 0.05 = 5.99.

The result of the Chi square test indicates that there is a strong association between infant and child mortality and the sources of water supply. Data from the study also show that 54.4% of the cases reported in Table 5.15 are related to unsafe source of water through there are more cases that are related to unwholesome source of domestic water supply.

The proximity of the sources of water can also determine the level of personal hygiene and the general cleanliness of the household and the health status of the rural communities.

Data from the sample survey show the various categories of time taken by each household to obtain water for domestic purposes. The information is contained in Table 5.18.

Table 5.18

Average Amount of Time Taken to Procure Water From Source

Time Minutes	Respondents	% of Total Resplndents
1-20	80	39.0
21-40	93	45.4
41.60	24	11.7
61.80	5	2.4
81-100	3	1.5
Total	205	100.0

Source: Field survey, 1988

To determine the dispersion from the mean time taken to procure water a standard deviation is used to analyse the data in Table 5.18. It is calculated first by obtaining the arithmetic mean and then measuring how much each value differs from it. Each difference is squared. For grouped frequencies as this sample the standard deviation is obtatined from the

formula $S = C. \sqrt{\left\{ \frac{\sum df^2}{f} - \left(\frac{\sum df}{f} \right)^2 \right\}}$,

where C is the amount of the class interval

d is the differences in terms of class interval between each class and the assumed mean and

f is the frquencies with which values occur in each class (Hammound and McCullagh, 1978).

Table 5.19

Standard Deviation of Time Taken to Procure Water from Source

1 Class	2 Class Mid-point x	3 Nof of Resp. f	4 Diff. assumed d	5 df	6 from mean d^2f
1-20	10.5	80	-1	-80	80
21-40	30.5	93	0	0	0
41-60	50.5	24	1	24	24
61-80	70.5	5	2	10	20
81-100	90.5	3	3	9	27

$\bar{x} = 26.89; \Sigma f = 205, \Sigma df = 37, \Sigma d^2f = 151$

Source: Table 5.18

$$S = 20 \sqrt{\left\{ \frac{151}{205} - \left(\frac{-37}{205} \right)^2 \right\}}$$

$$S = 20\sqrt{0.74 - \frac{1369}{42025}}$$

$$S = 20\sqrt{0.74 - 0.03}$$

$$S = 20\sqrt{0.71}$$

$$S = 20 \times 0.84$$

$$S = 16.8$$

The coefficient of variation (v) is therefore calculated.

$$V = \frac{S}{\bar{x}}$$

$$V = \frac{16.8}{26.89}$$

$$V = 0.62 \text{ or } 62\%$$

Where no variation exists in a set of observations V will be zero, and will increase with increasing magnitude in the differences between the observations (Norcliffe, 1977 in Ariyo, 1978). It can therefore be concluded from this analysis that there is a significant difference in the time taken to obtain water from sources since the value of the coefficient of variation is much greater than zero. The analysis clearly demonstrates that there is a variation in the

Having satisfying all the requirements for chi square technique, the calculated X^2 value is much greater than the critical value. It clearly shows that there is a significant association between infant mortality and the bathing habits of the rural inhabitants. This is attributable to the availability of safe water for domestic hygiene, hence poor hygiene breeds diseases which adversely affect infants, especially the cases of measles reported in various health care centres. This also confirms the assertion that time and distance also determine the degree of accessibility to water and its utilization for domestic hygiene of the rural inhabitants. Again the water used for bathing might be infested with some germs, and consequently infecting the rural inhabitants which result in severe debility, disability and even mortality.

To establish whether any association exists or not between child mortality and bathing place a chi square technique is used to analyse the data on child mortality and bathing places.

2.1.7.b Modernization and Rural Health Problems

While culture, taboos, religion and other beliefs, and socio-economic status determine the food habits and good hygiene of various communities (Oke and Ojofeitimi 1964; and Chikwem and Omotara, 1986) the penetration of modern good into the rural sector has its part to play on their health status. Mabogunje (1980) defines modernization as:

> "The process of social changes, and.... breeds its own needs and desires in those exposed to it" (p.39).

He further explains that modernization stimulates appetite for the consumption of certain 'modern' goods and services and therefore creates considerable [illegible] with traditional [illegible] especially in the rural areas. In [illegible], modernization has created in the rural [illegible] the taste for goods imported into the country or prepared in the urban centres such as bread, cakes and sweets. Some of these items are purchased and taken to the rural areas must have been contaminated especially fungal contamination in case of bread and cakes (Oke and Ojofeitimi, 1964). Chikwem and Omotara (1986) have suggested that the sources of food

Table 5.21

Observed and Expected Size Frequencies of Child Mortality and Bathing Places

No of child Deaths	Place of Bathing Streams/pond	Bathroom	Row Total
1-3	43 (55.1)	42 (29.9)	85
4-6	90 (77.9)	30 (42.1)	120
	133	72	205

Source: Field survey, 1988.

Calculated X^2 = 12.94, 1df., P 0.05 = 3.84

Since the critical X^2 value is very much smaller than calculated X^2 value, it then reveals a strong association between child mortality and places of bathing. It therefore validates the assumption that streams and ponds are conducive ecology for the habitation of snails, vector schistosomiasis, and when contracted through bathing in or wading through such ponds, it results in severe morbidity and mortality at a chronic stage. Although the water from such sources used in the bathrooms might be also infested but when boiled or warmed before bathing the risk might be minimal.

This analysis concludes the association between environmental factors and health status of rural communities in this study, and the next section looks at the socio-economic status of the rural inhabitants and their accessibility to and utilization of health care services in Pankshin LGA.

5.3 Health Care Service Accessibility

The spatial distribution of health care services and facilities in Pankshin LGA has been analysed in Chapter four while this section seeks to determine association, if any, between the socio-economic status of the rural communities and their accessibility to health care services.

Low income, low education, and low level of occupations, in fact a precarious level of occupations held by the rural communities do have an important role to play in the health status of the rural inhabitants. People in low socio-economic stratum often appear to be incapable of availing themselves of medical services or complying with medical orders. So powerful are the effects of socio-economic categories and their cultural variations that they affect the health of people and the motivation and courage to seek health care services for any illness.

This study tries to use some variables to establish some relationship between the categories of socio-economic status of the sampled population and the people's accessibility to and utilization of health care services based on their status. To establish the extent to which the sampled population can go for medical services, data on proximity to health centre are shown in Table 5.22.

Table 5.22 shows that only 49.8% of the sampled population are close to any health centre that is within WHO; standard of a dispensary service range of zero to four kilometres.

Table 5.22

Proximity to Health Care Centre (Dispensary, Hospital or Maternity Clinics Both Government and Private).

Distance (km)	Respondents	% of total Resp.
0-5	102	49.8
5-10	51	24.9
10-15	21	10.2
15-20	16	7.8
Above 20	15	7.3
Total	205	100.0

Source: Field survey, 1988

Data from the study show the distance between the sampled and the general hospital at Pankshin, Shendam or Langtang as referral points for the nearest health centre from their various locations. The information is presented in Table 5.23.

Table 5.23

Distance to a General Hospital as Referral Point in the Study Area

Distance (km)	Respondents	% of Total Respondents
0-10	54	26.3
10-30	39	19.0
30-70	65	31.7
70-120	38	18.5
Over 120	9	4.5
Total	205	100

Source: Field survey, 1988.

Table 5.23 shows that only about 45.3% of the sampled respondents are within a radius of 0-30km of any hospital service range, though WHOs standard is 0-10km

To determine the utilization of the facilities in such hospitals despite the distance constraint, a chi square test is used to analyse the data gathered

on literacy level and consultation visits for medical care services as shown in Table 5.24.

Table 5.24

Computing X^2 Values of Medical Service Utilization and Level of Literacy

Medical Service Utilization	Literacy Level Non-Literate	Literate	Row Total
No Access	104	21	125
Utilize Medical service	14	66	80
Column Total	118	87	205

Oij	Eij	(Oij-Eij)	$\frac{(Oij-Eij)^2}{Eij}$
104	72	32	14.22
14	46	-32	22.26
21	53	-32	19.32
66	34	32	30.12
205	205		85.92

Calculated X^2 = 85.92, 1df., P 0.05 = 3.84

Source: Table 5.11

Table 5.25

Observed and Expected Size Frequencies of Medical Service Utilization and Occupational Status

Medical Service Utilization	Occupational Status Primary	Secondary	Row Total
No Access	151 (138.2)	10 (22.8)	161
Utilize medical serive	25 (37.8)	19 (6.2)	44
Column Total	176	29	205

Source: Table 5.12

Calculated-X^2 = 39.14, 1df., P 0.05 = 3.84

Having satisfying all the requirements for chi square statistic, the calculate X^2 values are very much greater than the critical values, it is therefore concluded that there are very strong associations between medical care service utilization and the levels of literacy and occupational status of the rural inhabitants. It is evident then that there is a strong relationship between the socio-economic status of the rural inhaibtants and their accessibility to and utilization of modern medical care services. These tests affirm the assertion that the sophisticated medical care services can only be accessible to and utilizedby a small proportion of the population in the higher socio-economic stratum at the

expense of the majority in lower socio-economic strata.

To be more confident with the above affirmation a chi square test is used to analyse the data on income level of the respondents and their utilization of medical care service.

Table 25.25b

Observed and Expected Size Frequencies of Income and Medical Care Service Utilization.

Medical Service Utilization	Income level (₦) 200	200-499	500-799	800-1199	Row Total
No Access	90(76.2)	51(43.4)	2(14.2)	3(12.1)	146
Utilize medi Service	17(30.8)	10(17.6)	18(5.6)	14(4.9)	59
Column Total	107	61	20	17	205

Source: Field Survey, 198

Calculated X^2 = 73.1., 3df., P. 0.05 = 7.81

Satisfying all the requirements for chi square test the critical value is much smaller than the computed X^2, it therefore shows that there is a very strong association between the level of income and medical care service accessibility and utilization. The result further confirms the assertion that health care system based western model is highly biased

toward the small proportion of the population on very high socio-economic status.

The time it takes a patient to be attended to at health facility is as important, if not more important than the actual distance he has managed to travel in order to obtain such facilities and services. In this regard this study considers the waiting time by patients and time given for diagnosis by the health care personnel is very crucial in health care planning. This study postulates that there is a relationship between socio-economic status and length of stay in a nospital in order to obtain the service.

To either accept or dismiss this hypothesis, some chi square tests are used to analyse the data on waiting time in hospital and levels of literacy, income and occupational status of the sampled population.

Table 5.26

Observed and expected Size Frequencies of Waiting Time in Hospital and Level of Literacy

Waiting Time	Literacy Level		Row Total
	Non-Literate	Literate	
Too long	91 (77.7)	37 (54.3)	128
Not long	27 (44.3)	50 (32.7)	77
Column Total	118	87	205

Source: Field survey, 1989

Calculated X^2 = 25.48, 1df., P. 0.05 = 3.84

Table 5.27 is to test the relationship between Occupational status and waiting time.

Table 5.27

Observed and Expected Frequencies of Waiting Time in Hospital and Occupational Status

Waiting Time	Occupational status		Row Total
	Primary	Secondary	
Too long	124 (115.9)	11 (19.1)	135
Not long	52 (60.1)	18 (9.9)	70
Column Total	176	29	205

Computed X^2 11.73, 1df., P. 0.05 = 3.84

Source: Field Survey, 1988

Table 5.28

Observed and Expected Frequencies of Wating Tim in Hospital and Income Level

Wating Time	Income level				Row Total
	200	200-499	500-799	800-1199	
Too long	75 (55.8)	21(31.8)	6(10.4)	5(8.9)	107
Not long	32 (51.2)	40(29.2)	14(9.6)	12 (8.1)	98
Column Total	107	61	20	17	205

Source: Field survey, 1988

Computed X^2 = 28.97, 3df., P. 0.05 = 7.82.

All the critical values of the chi square tests in Tables 5.26, 27 and 28, are very much smaller than the computed values, it is therefore concluded that there is a strong association between socio-economic status and waiting time in the hospital.

The tests in this section of the study clearly demonstrate that those on higher socio-economic ladder are attended to faster and given enough diagnosis time than the other group. This situation confirms the vicious circle, of poverty and health status. The rural inhabitants have to travel long distances in order to obtain the services leaving behind some crucial agricultural activities and again to have very long waiting time in health care service centre before being attended to and probably with very poor rapport from the provider of the services.

It has been the policy of various governments to establish 'specialist hospitals' as a way of improving the overall health status of the citizenry. But the critical aspect of accessibility to and utilization of such services by all and sundry is utterly neglected. To establish whether the accessibility to and patronage of such services cut across the socio-geographic strata of the entire population some chi square tests are used to analyse some data on these variables. For the

purpose this assertion some questions on specialist health care services i.e. dental and eye clinic services were administered on the sampled population as to their patronage and awareness of such health care services.

Chi square statistic is used to analyse the data on literacy level and the utilization of the specialist health services as shown in Table 5.29.

Table 5.29

Observed and Expected Frequencies of Literacy Level and Utilization of Specialist Health Care Services

Utilization of Specialist Health Care Services	Literacy level Non-literate	Literate	Row Total
Never used such service	104 (90.9)	54 (67.1)	158
Ever used such service	14 (27.1)	33 (19.9)	47
	118	87	

Source: Field Survey, 1988

Calculated X^2 = 17.59, d.f., P 0.05 = 3.84.

The Calculated X^2 is much greater than the critical value hence, it is concluded that there is a strong

association between the level of literacy and the utilization of specialist health care services. Similarly with reference to the income level of the sampled population a Chi square test result is calculated X^2 = 43.03, 3df., P 0.05 = 7.82, which implies that more of the respondents on a higher income level have more access to and utilize the specialist health care services than those on the lower income level. These tests affirm the assertion that high income people have the means to get their eye and tooth problems treated in these health care services centres and they are more aware of such facilities than the low socio-economic groups.

In considering the importance of maternal and child welfare clinics some data are collected from field survey on the usage of such facilities by the rural communities as shown in Table 5.30.

Table 5.30

Literacy Level and Maternity Clinic Utilization

Maternity clinic Utilization	Level of literacy Non-literate	Literate	Row Total
Attended clinic	50 (73.1)	77 (53.9)	127
No need	44 (31.1)	10 (22.9)	54
Against religion	24 (13.8)	0 (10.2)	24
Column Total	118	87	205

Source: Field survey, 1988

Calculated X^2 = 47.56, 2df., P. 0.05 = 5.99.

The calculated X^2 is very much greater than the critical value, it is concluded that there is a strong association between the literacy level of the rural communities and the usage of the maternity clinics. It implies that the expectant mothers of those in the lower educational level or illiterate are believed to have less access to and so use the maternal and child welfare clinic less than the more educated. This consequently is a contributing factor to the high infant mortality rate among the people with low socio-economic status. About 53.7% of the sampled population attribute the poormaternity attendance to lack of money and distance from their localities,

11.7% consider maternity clinic visits as against their religion and unaware of such facilities for expectant mothers and their babies while some do not see the need for such services.

To conclude this section, a general inference can be drawn from all these tests that apart from the geographical disparity in the utilization of health care services, there are the social and economic factors that initiate against the patronage of the health care services by the rural inhabitants hence they have to resort to other health care system that is discussed in the next section.

5.4 Patronage of Traditional Health Care System

The poor patronage of the modern health care services by the rural inhabitants because of spatial, social, cultural and ecobomic factors, pushes them to seek other means of solving their immediate health problems. This other means of health care services patronized by the rural inhabitants is the traditional health care system. The most urgently sought traditional health care personnel are the traditional births attendants (TBA). Table 5.31

shows the role of the TBAs in the rural health care system in the study area.

Table 5.31

Comparision of Mean Child Delivery Between TBAs and Orthodox Midwives 1986-1987, in Pankshin LGA.

Location of Clinic	Deliveries in clinic	Home Deliv. TBAs
Longkat	89	208
Jannaret	59	153
Pankshin (Hosp.)	587	328
Kadun	49	163
Kabwir	170	366
Amper	91	398
Gyangyang	96	288
Total	1141	1904

Source: Compiled from various Antenatal clinic Record Books December, 1987.

Table 5.31 shows that about 62.5% of the deliveries recorded in this period were attended to by the traditional birth attendants.

To assess whether the difference between the deliveries attended to by TBAs and orthodox midwives is statistically significant or not, the Kolmogorov-Smirnov (K-S) test is used to analyse the data in

Table 5.31. The K-S test requires that observations to be analysed be independent events which are measured at the ordinal or higher levels and classified into two or more exclusive categories. The test relates the absolute maximum difference, D, between the cumulative proportions of the two samples to a theoretical cumulative distribution given under the null hypothesis (Norcliffe, 1977 in Ariyo, 1978).

For this analysis, the null hypothesis (H_o) is therefore that no difference exists between the patronage of traditional birth attendants (TBAs) and midwives by the rural inhabitants. For every pair of deliveries to be analysed the critical value of D will be obtained at the 0.05 level of significance thus:

$$D0.05 = 1.36 \sqrt{\frac{n_1 + n_2}{n_1 \cdot n_2}}$$

where n1 and n2 refer to samples 1 and 2 respectively.

Table 5.32

Kolmogorov-Smirnov Two Sample Test Applies to the Child Deliveries by TBAs and Midwives

Location of clinic	No of Deliv. Midwives	TBAs	Commulative Proportions of Deliveries Midw.	TBAs	Difference
1	2	3	4	5	6
1	89	208	0.078	0.109	0.031
2	59	153	0.130	0.189	0.059
3	587	328	0.644	0.361	0.283
4	49	163	0.687	0.447	0.240
5	91	398	0.836	0.656	0.180
6	190	366	0.916	0.865	0.051
7.	96	288	1.000	1.000	0
	1141	1904			

Source: Table 5.31

Largest difference = D = 0.283

Critical value of D for a two-tailed test is

$$D_{0.05} = 1.36\sqrt{\frac{n1 + n2}{n1 \cdot n2}}$$

$$= 1.36\sqrt{\frac{1141 + 1904}{1141 \times 1904}}$$

$$= 1.36\sqrt{\frac{3045}{2172464}}$$

$$= 1.36\sqrt{0.0014}$$

$$= 1.36 \times 0.0374$$

$$D_{0.05} = 0.044$$

The largest difference, D, is 0.283. Because this value is very much greater than the critical value of D which is 0.044, the null hypothesis (Ho) at the 0.05 level of significance is rejected and a conclusion is drawn that there is a very statistically significant difference between the patronage of TBAs and midwives in child deliveries in the rural communities of Pankshin LGA.

This result further validates the hypothesis that a large proportion of deliveries are managed outside the health institutions by the TB As, in the rural areas and thus reveals the significant contribution of the traditional health care service system to the development of the rural communities and the nation in general.

Apart from practising midwifery, the traditional health care system renders help to other areas of health care services in the rural areas of Pankshin LGA. Data from the study show that 62.0% of the rural population seek health care services from the traditional health care system because of its proximity and in accordance with the culture and beliefs. The data further show that cases of mental illness. fractures, poison, snake bites, circumcision and infertility (childlessness) are treated by the traditional practitioners as shown in Table 5.33.

Table 5.33

The Mode of Treatment for Some Health Problems

Cases	Health System		
	Modern	Traditional	Both
Snake Bite	137 (66.8)	62 (30.2)	6 (2.9)
Circumcision	126 (61.5)	70 (34.1)	9 (4.4)
Mental Illness	68 (33.2)	127 (62.0)	10 (4.8)
Poison	63 (30.7)	134 (65.4)	8 (3.9)
Diarrhoea	172 (83.9)	27 (13.2)	6 (2.9)
Measles	169 (82.4)	32 (15.6)	4 (2.0)
Childlessness	62 (30.2)	128 (62.5)	15 (7.3)

Percentages of total respondents in brackets.

Source: Field Survey, 1988.

The information confirms that the traditional health care system plays a very vital role in the rural communities of Pankshin LGA.

To establish whether or not there is an association between the socio-economic status of the rural communities and the utilization of the traditional health care system, Chi square technique is used to analyse the data on levels of literacy and occupational status and some health problems indicated by respondent to be treated by the traditional health care system.

The data on income and responses to the health problems to be treated by the traditional health care system do not meet requirements for chi square test therefore this variable i.e. income is not used in this analysis.

Table 5.34

Observed and Expected Size Frequencies of Literacy Level and Mode of Treating Mental Illness.

Mode of Treating Mental Illness	Literacy level Non-literate	Literate	Row Total
Modern	18 (39.1)	50 (28.9)	68
Traditional	96 (73.1)	31 (53.9)	127
Both	4 (5.8)	6 (4.2)	10
Column Total	118 (5.8)	87	205

Source: Field survey, 1988

Calculated χ^2 = 45.03, 2df., P.0.05 = 5.99

The computed χ^2 value is much greater than critical value it is then concluded that there is a strong association between the level of literacy and the belief in the mode of treating mental illness. The non-literate group in the sampled population accredited traditional health care system as the best way to threat mental illness. This might be attributable to

their lack of awarness of the availability of mental health care services in some hospitals to treat this case. The result also clearly demonstrates that rural inhabitants who are less literate depend on traditional health care system for most of their health problems.

A chi square test is also used to analyse the data on literacy level and mode of treating poison as indicated by the sampled population.

Table 5.35

Observed and Expected Size Frequencies of Literacy Level and Mode of Treating Poison

Mode of Treating Poison	Literacy Level		Row Total
	Non-literate	Literate	
Modern	11 (36.3)	52 (26.7)	63
Traditional	107 (81.7)	35 (60.3)	142
Column Total	118	87	205

Source: Field survey, 1988.

Calculated X^2 = 60.05, 1df., P. 0.05 = 3.84

The computed X^2 value is very much larger than critical value it thus shows that there is a strong association between the level of literacy and the utilization of traditional health care system more especially in the rural areas.

A chi square technique is further used to analyse the data on literacy level and the mode of solving the problem of childlessness as shown by the respondents.

Table 5.36

Observed and Expected Size Frequencies of Literacy Level and Mode of Solving the Problem of Childlessness

Mode of solving childlessness	Literacy Level Non-Literate	Literate	Row Total
Modern	12 (35.7)	50 (26.3)	62
Traditional	101 (73.7)	27 (54.3)	128
Both	5 (8.6)	10 (6.4)	15
Column Total	118	87	205

Source: Field survey, 1988.

Calculated X^2 = 64.17, 2df., P. 0.05 = 5.99.

The result of the chi square test reveals that the computed value is much greater than the critical value which indicates a strong association between the level of literacy and the utilization of traditional health care system in an approach to solving the problem of infertility in the rural communities.

Furthermore, to establish the association between socio-economic status of the rural communities

and the utilization of traditional health care system chi square technique is used to analyse the data on occupational status and mode of treating mental illness.

Table 5.37

Observed and Expected Size Frequencies of Occupational Status and the Mode of Treating Mental Illness.

Modern Treating Mental Illness	Occupational Status Primary	Secondary	Row Total
Modern	58 (58.4)	20 (9.6)	68
Traditional	125 (109.0)	2 (18.0)	127
Both	3 (8.6)	7 (1.4)	10
Column Total	176	29	205

Source: Field survey, 1988.

calculated x^2 = 53.89, 2df., P. 0.05 = 5.99

The calculated X^2 is much greater than the critical value therefore it indicates a strong association between the occupational status and the utilization of the traditional health care system.

A general inference can be drawn from the results of the chi square tests that those on a higher socio-economic status would tend to define the causation of these health problems within the natural situation than those with a lower socio-economic status, thus supporting

the assertion that those who have been exposed to change factors would tend to change their perceptions and choose methods of treating such health problems different from those in which they are brought up. The results of the tests further confirm the assertion that the modern health care system does not cover the entire population and as such the traditional health care system plays a vital role in filling the gap.

This general inference concludes the analysis of data to establish relationship between socio-economic status and the utilization of the traditional health care system. The next chapter discusses the major findings from these analyses and testing the hypotheses earlier postulated for this study.

CHAPTER SIX

ANALYTICAL FINDINGS

At the outset of the this research several hypotheses were posited concerning the factors which affect the effectiveness of the health care service system in covering the rural inhabitants of Pankshin LGA. This chapter summerises the outcome of the various tests carried out on the data in previous chapters and shows whether to accept or reject the study hypotheses.

6.1 Major Diseases and Health Problems in the Rural Areas of Pankshin LGA

Hypothesis A: The major diseases and health problems are related to the environmental conditions and socio-economic characteristis of the rural communities.

Differences in attitude to by different kinds of ecological riches. Terrain influences the transmission of infectious diseases as well as the distribution of kinds of degenerative diseases. It is evident from the epidemiological pattern depicted in chapter four that most health problems are related to the environment.

The test result reveals a [illegible] correlation between the pattern of diseases and their vectors and the varying environmental characteristics of the study area. Kruskal-Wallis analysis of variance (K-W ANOVA) clearly demonstrates that certain parts of Kaduna LGA are hyperendemic in certain diseases and the distribution of the vectors also varies with the altitude of the area as shown in Fig. 4.3.

On the part of this hypothesis that "health problems are related to the environmental conditions of the rural communities". Chi" square statistic reveals a very strong association between the environmental parameters (waste disposal system, housing facilities and sources of water supply) and the health status of the rural inhaibtants in this study area. The tests reveal a strong relationship between infant mortality rate and the toilet systems of which the majority of the sampled population use the 'bush system'. This shows that the germs secreted along with waste get into the rural inhabitants either through food contamination, drinking water or on the fingers.

The test further reveals a positive association between infant mortality and bathing habits. The coefficient of variation (v) indicates a great disparity in time taken for the procurement of water

by various health [illegible] in the area. This therefore suggests a variation in the level of personal hygiene and the general cleanliness among households and consequently affects the health of the infants and the entire family as cases of such diseases are reported in the various health centres in the rural areas.

Further to this hypothesis that the major health problems are related to the socio-economic characteristics of the rural communities some data are analysed using statistical tests. The results of the tests show strong relationships between infant mortality rates and the food habits of the rural inhabitants under study. There is also a strong association between the level of literacy and the infant mortality. This implies therefore that the [illegible] and the general cleanliness [illegible] occupational [illegible] and income levels of the rural inhabitants. [illegible] confirm the assertion that the people at lower socio-economic status have more [illegible] and become more marginalized with increasing participation in the health care delivery system. The [illegible]

the means to [illegible] their living conditions that will enhance their health status. These problems include poor housing conditions, unsafe water supply, use of fuel wood as source of energy, poor nutritional level of staples, subject ignorance of the environmental processes and characteristics that promote conducive ecology for the pathogens to thrive and at times becomes more compounded with poor crop yields due to the erratic nature of the climatic conditions.

The findings in this study reveal that large segments of the rural population still live in poor dwellings of mud houses and high room occupancy ratios of between two to four persons per room with very poor ventilation systems. The study reveals that it is the children that are always crammed together in a room. The room heating system uses fuelwood as the source of energy.

Good health should be encouraged through adequate housing, improvement in the quality of food, adequate potable water [illegible] and waste sanitation, and a well [illegible] disposal of human waste and refuse, the proper and effective health and disease surveillance in the rural areas and efficient transportation networks for movement of people in the rural areas to service centres.

c.. Spatial distribution of Health Care Service Institutions

Hypothesis B: There is a variation in the distribution of health institutions and personnel in Pankshin area and as such the health care services do not effectively reach a large proportion of the population especially the rural communities.

The test result on the population coverage of the general hospital at Pankshin reveals a strong negative correlation between the number of patients (out-and in-patients) from each district and the distance they have to travel to the general hospital. This demonstrates that the hospital service to the people becomes less effective with increasing distance, therefore the hospital located at Pankshin alone does not effectively reach the rural majority who are more susceptible to diseases.

Arithmetical calculations clearly show that the service area of the hospital is very much wider than the ideal standard hence this will affect the effectiveness of the services offered to the rural inhabitants. However dispensaries and maternity clinics seem to have fair service areas and service ratios, but the terrain seems to have its role to play on the effective population coverage of such services. Further arithmetical calculations indicate an inadequacy in the care personnel to cover the entire

population in the study area, although this is a general phenomenon in the state and the country as a whole. The implication here is that rural inhabitants in the study area will be less served by this category of health personnel since these health care centres are located in towns.

With regard to the diagnosis of patients who are attacked by schistosomiasis, amoebiasis or intestinal helminthiasis etc, it requires laboratory tests, but there are only seven laboratory technicians serving in the COCIN Rural Health Programme, data on their distribution are not available, and four such technicians are in the general hospital, and of course, these are for those in the town.

The results of statistical tests and MMI localization coefficient clearly indicate that the preventive health care services are overconcentrated in certain locations at the expense of the rural areas, such as the inunization exercise, and pipe-borne water supply is completely non-existing in the rural areas. These tests demonstrate that both preventive and curative health care services are concentrated in certain locations and consequently do not effectively cover the entire population, and transportation problem is another factor militating against the effective coverage of the rural inhabitants.

6.3 Socio-economic status and accessibility to and utilization of modern medical care services

Hypothesis C: There is a relationship between the socio-economic status of the rural communities and their accessibility to and utilization of modern medical care services.

The results of the tests show strong associations between socio-economic status and access to medical care services in the study area. The chi square test used to establish any relationship between literacy level and utilization of medical care services show a very strong association between these variables. The inference from this test is that the higher the level of education the more the utilization of the medical care services. This shows that the rural inhabitants, as a result of their low socio-economic status do not have access to the medical care services which is largely due to their socio-economic status. It is therefore implied that the more sophisticated medical care system the more inaccessible are the medical care services to the rural inhabitants.

The tests further reveal that those in low levels of literacy and occupational status have long waiting time in the medical care centres. This situation could be attributable to the ignorance of the number of procedures that patients have to go through,

and inability to read directions. These and other factors culminate to keep away those in the lower socio-economic cadre from utilizing the modern medical care services and seek other means to their health problems.

Moreover, these facilities are often very few and located in the urban centres. Inadequate transportation systems and the cost of transport and lodging in the urban centre for the medical care services further limit the actual access to and utilization of the medical care services by the rural inhabitants who are in most cases in the lower socio-economic status. Only a small proportion of the sick in rural areas, this study reveals, go for treatment during the rainy season.

Furthermore, in relation socio-economic status and accessability to and utilization of modern care services, this study in this section used specialist health care services i.e. eye clinic and dental clinic services as factors to establish the relationship between socio-economic status and accessibility to and utilization of such services. The results of the t- clearly reveal that the specialist health care syste- is only accessible to and used by those people in higher socio-economic strata. The tests show that

the majority of people in the lower socio-economic status are not aware of such facilities let alone to use them, and even within this group some of them claim to be aware of such services but lack the financial resources to seek such services. A large proportion of them consider both financial resources and distance as the main constraints acting against their utilization of the specialist health care services and facilities even though they have such health problems that require the services.

With regards to the maternity and child welfare clinics the test results demonstrate a strong association between the socio-economic status and maternal visits and child care check-ups. This is however not unconnected with the financial resources which the expectant mothers have to use for their transportation, [illegible] from their localities and domestic and [illegible]. During labour, [illegible] activities, there is little time [illegible] and [illegible] that are far away [illegible] be concluded that apart from some spatial disparity in the distribution of health care services in this area, there are [illegible] social, cultural and economic disparities in the accessibility to and utilization of health care services by the rural inhabitants.

It is established through arithmetical calculations that road networks are grossly inadequate to facilitate easy movement of the rural inhabitants from their domicile to the health care service centres. This further frustrates the rural people in this study area, and elsewhere, in seeking health care services.

6.4. Utilization of Traditional Health Care Services

Hypothesis D: There is a relationship between the socio-economic status of the people and the utilization of traditional health care services in Pankshin LGA.

The results from the tests show that there is a significant difference between child deliveries attended to by the traditional birth attendants (TBAs) and child deliveries attended to by the orthodox midwives. The results further indicate that the rural inhabitants have been marginalized in terms of modern health care services and as such they have to patronize the traditional health care system which is evident in child deliveries.

In converting other health problems into percentages the results do not show any such relationship between the socio-economic status of the people and the utilization of the traditional health care system. Out of the [illegible] on some health problems administered

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to the heads of households only diarrhoea and measles that have scores below 30% though a number of them indicate that these problems can be treated by both health care systems.

However, using chi-square technique in analysing some data on the socio-economic status and the mode of treating some health problems such as infertility, poison and mental illness, the results show very strong associations. The tests reveal that the rural communities who are remote from the modern health care service rely heavily on the traditional health care system for their health problems. The results further indicate that the utilization of the traditional health care system varies with socio-economic status of the people in the rural area. This shows that the people in lower socio-economic status patronize the traditional system more than those in the higher socio-economic status.

Observations and interviews during field survey reveal that the traditional practitioners usually use crude implements which are not sterilized such as knives, needles, old pieces of cloths for bandaging wounds and fractures. The patients were found to be housed in poorly ventilated rooms, using old mats or bare floor or ground for child deliveries.

[illegible] observations were made on the drug administration on the patients. The observation reveals that the drugs used by the traditional practitioners are not purified and lack accurate dosages. The containers for storing the decoctions are sometimes not clean, such preparations are often left in a pot and heated up again daily before use. But the traditional health care system cannot be discarded because many couuntries have integrated it into the national health care delivery system and it will take many years to produce appropriate modern health care system to adquately cover the entire population especially the rural area.

These findings throw a poser on what can be done to improve on the quality of health care services being delivered by the traditional practitioners. Full recognition should be given to the traditional practitioners as other countries like India and China with a training programme that will improve quality of their services. The practitioners should be properly utilized in order to produce our own drugs favourably with the imported ones from the local herbs the traditional practitioners use, for example anti-snake venom which is very expensive to import, and other expensive drugs could be produced locally.

Generally the results of the statistical and non-statistical tests reveal a broad picture of the health status of the rural inhabitants as:

(i) Infants and young children share a disproportionately large burden of sickness and death in the rural areas of Bankshin LGA.

(ii) Malnutrition is a severe health problem in young children in the rural areas as the cases reported in health centres in 1987.

(iii) Child rearing practices are one of the contributing factors in childhood malnutrition since some high-protein foods are reported by the respondents as not being introduced into the child's diet.

(iv) Environmental conditions in the rural areas contribute immensely to the prevalence of illness and habitation of the vectors which varies also with the ecology of various rural areas.

(v) The rural inhabitants who are of lower socio-economic status tend to have higher prevalence of diseases, infant mortality and morbidity since their access to and utilization of health care services are limited.

(vi) The opportunities for the households of lower socio-economic status to receive information that would assist them in improving and maintaining their health appear to be more restricted than for wealthier households.

(vii) The traditional health care system which is given least attention by various governments is highly utilized by the rural communities.

These general inferences conclude this chapter on principal findings while the next chapter discusses the proposal for provision of effective health care services in Pankshin LGA with particular reference to the rural communities based on these findings.

A PROPOSAL FOR THE PROVISION OF EFFECTIVE HEALTH CARE SERVICES FOR THE RURAL COMMUNITIES IN PANKSHIN L.G.A.

This chapter seeks to propose effective ways of providing health care services to the rural areas of Pankshin LGA, taking into consideration the findings and discussions on the problems of the people and local resources that could be mobilized for effective health care services.

7.1 Proposal of a Modest Health Care Service System for Pankshin LGA.

A modest health care service system is one in which the health care service centres are built very close to the patient where he could stay with his family who would be responsible for preparing food and providing basic patient care than elaborate facilities of modern hospitals in the urban centres where poor rural patient cannot afford any accommodation money when seeking medical care.

Two alternatives courses of action suggesting either to group the communities in the study area into small settlements for the provision of the health centres or leave them in their present farmsteads and hamlets and provide health services in more appropriate

and accessible areas. The regrouping of the communities into larger settlements to achieve the required population thresholds would be too costly in both economic and psycho-social terms. This study therefore proposes the establishment of health service centres in more accessible areas and within possible walking distance.

7.1.1 Curative Measures

Based on WHOs standard of health care service population threshold, Pankshin LGA is to have 23 hospital, 92 primary health centres, 115 health clinics and 460 mobile health clinics during the period of this study. Based on health service areas there should be three hospitals, 93 primary health centres and 179 dispensaries.

However because of the huge financial resources required for the construction and maintenance of such centres to meet the WHO standards a much fewer number of health care service centres and units have been proposed for the LGA. In proposing new health centres for Pankshin LGA, there is need to have an overview of the existing health centres as to their spatial and population coverage. Table 7.1 shows the spatial coverage of the existing health centres built by the government.

Table 7.1

Existing Health Care Centres in Pankshin LGA, and Spatial and Population Coverage, 1988

Type of Health Centre	No	Land Area Coverage (km^2)	Maximum Walking Radius (km)	Pop. per Centre
Hospital	1	2334 (800)	27.3 (16)	229429 (10,000)
Maternity clinic	6	389 (200)	11.0 (8)	38,238 (2,000)
Dispensaries	18	130 (50)	6.4 (4)	12,746 (1,000)

WHO's Standard in Brackets

Source: Field Survey, 1988

Table 7.1 shows a gross inadequacy in the spatial and population coverage of the health centres in the study areas hence new one have been proposed as shown in Table 7.2.

Table 7.2

Proposed Health Care Centres for Pankshin LGA Including The Existing Ones with Spatial and Population Coverage

Type of Health Centre	No	Land Area Coverage (km^2)	Maximum Walking Radius (km)	Pop. per Centre
Referral Hosp.	1	2334	27.3	229,429
Cottage Hosp.	4	466.8[a]	12.2[a]	45,886[a]
Maternity Clinics	6	166.7b	7.3b	15,386b
Dispensaries	24	66.6c	4.7c	6,748c

(a) Including Referral Hospital

(b) Including Cottage Hospital

(c) Including Maternity Clinics

Source: Field survey, 1988

Table 7.2 clearly shows an improvement over the existing situation of the health care coverage. This will bring health care services nearer to the rural inhabitants who do not have the resources to travel long distances to seek health care services.

The general hospital at Pankshin is proposed to remain and upgraded to a referral hospital whereby other health centre can only refer major cases to it. This referral hospital is to serve the entire population on referral cases apart from its service area.

Below the referral hospital four cottage hospitals have been proposed for the LGA each serving a population of 45886 with 45 beds. The cottage hospitals are to have a service area of 466.8 km^2 each with a service range of 0-12.2km which is moderately closer to the target rural population compared to the only hospital at Pankshin. The cottage hospitals are to have maternity services as well.

Apart from the existing six maternity clinics, four new ones have been proposed to ensure proper coverage. The clinics are to serve a population of 15388 within a service area of 166.7 km^2 and a service range of 0-7.3km each. These clinics can easily be reached on foot by the rural inhabitants. The clinics are to have six beds each which are to be used for a few hours only.

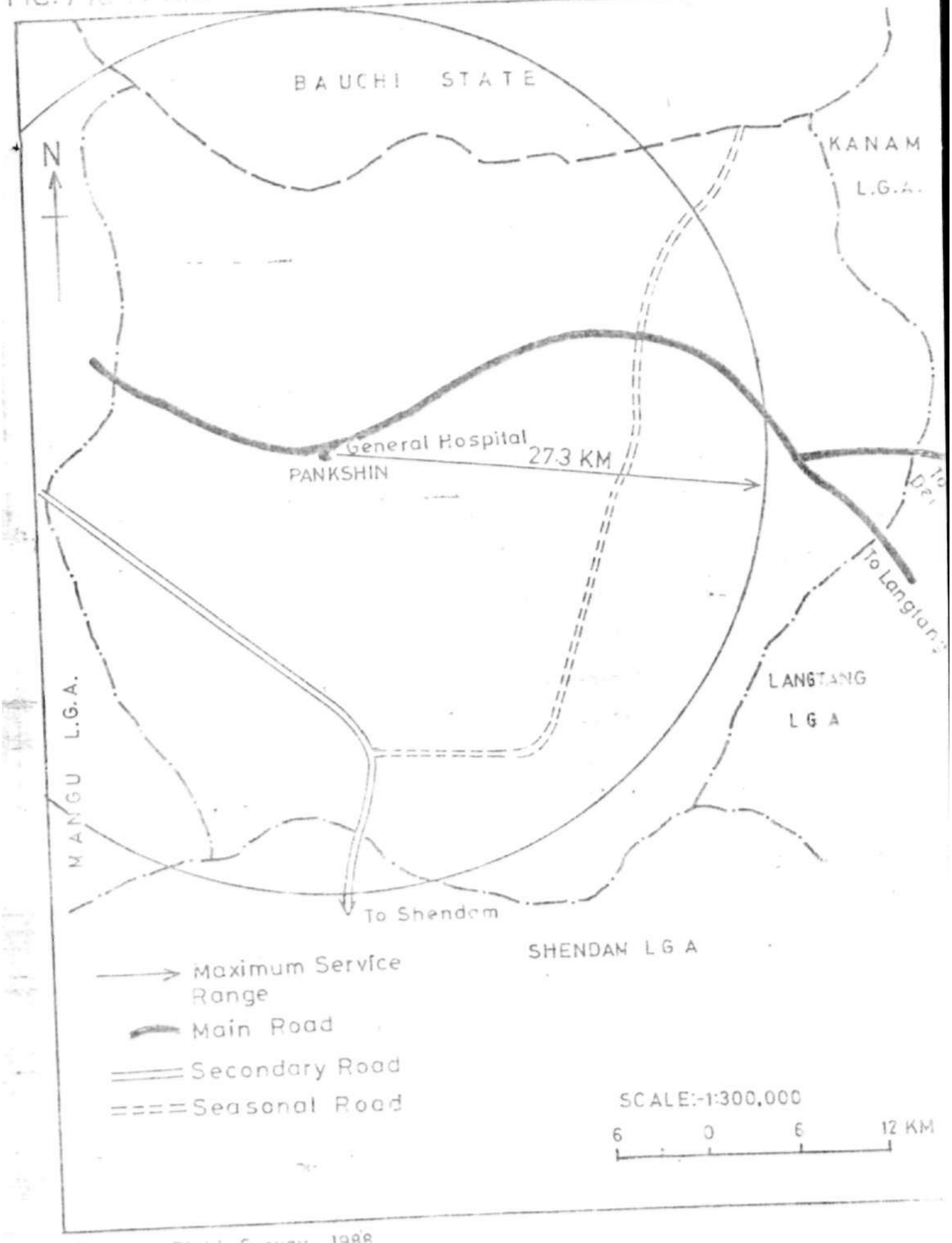
Because the maternity clinics are to offer general services as well the 18 dispensaries still remain with six additional ones. However these dispensaries can easily be reached on foot, and should have four emergency beds each.

In siting of the health centres consideration have been taken in terms of the terrain and physical accessibility of the areas. These centres are shown in Fig. 7. 1-3.

7.1.2 Staffing

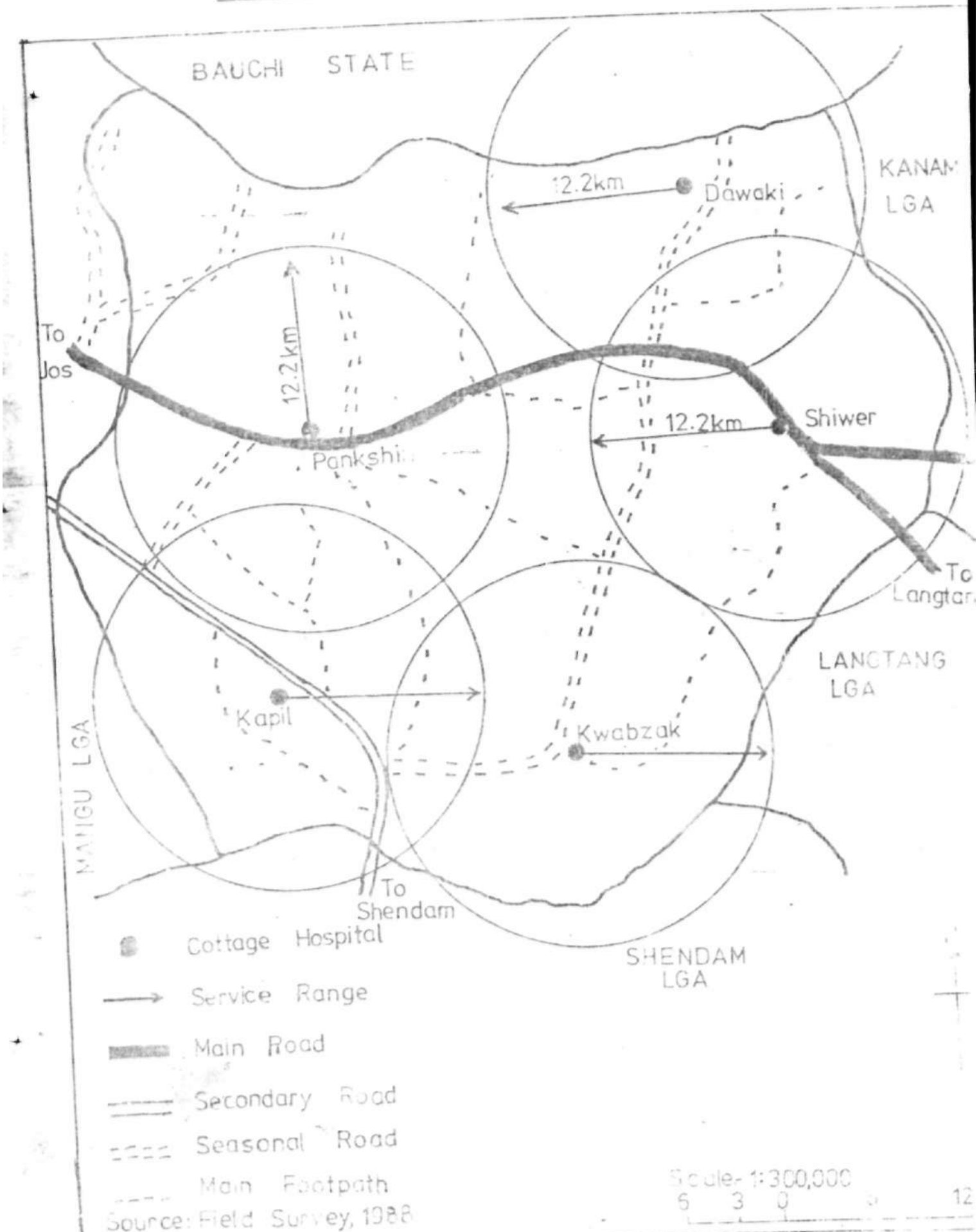
If the health care service system is to truly serve a population of 229,429 people effectively irrespective of socio-economic status it must have adequate number of staff. Individual services at the health centres proposed are given when demanded by the population. Therefore the number of personnel proposed is determined by the number of visitors per day. WHO (1988a) has recommended an average of 2.5 visits per person per year as a desirable standard for developing countries and 3.5 visits for developed countries. For a well developed health care system 1.5 visits per person per year will be regarded as a minimum standar That is if the health care system in the structure does not see 1.5 x 229429 persons per year, it is then not

FIG. 7.1a PANKSHIN LGA: EXISTING HOSPITAL SERVICE F



Source Field Survey, 1988

FIG.7.11: PANKSHIN LGA: PROPOSED COTTAGE HOSPITAL SERVICE RANGE



Source: Field Survey, 1988

FIG.7.24: PANKSHIN LGA: EXISTING MATERNITY CLINIC SERVICE RANGE

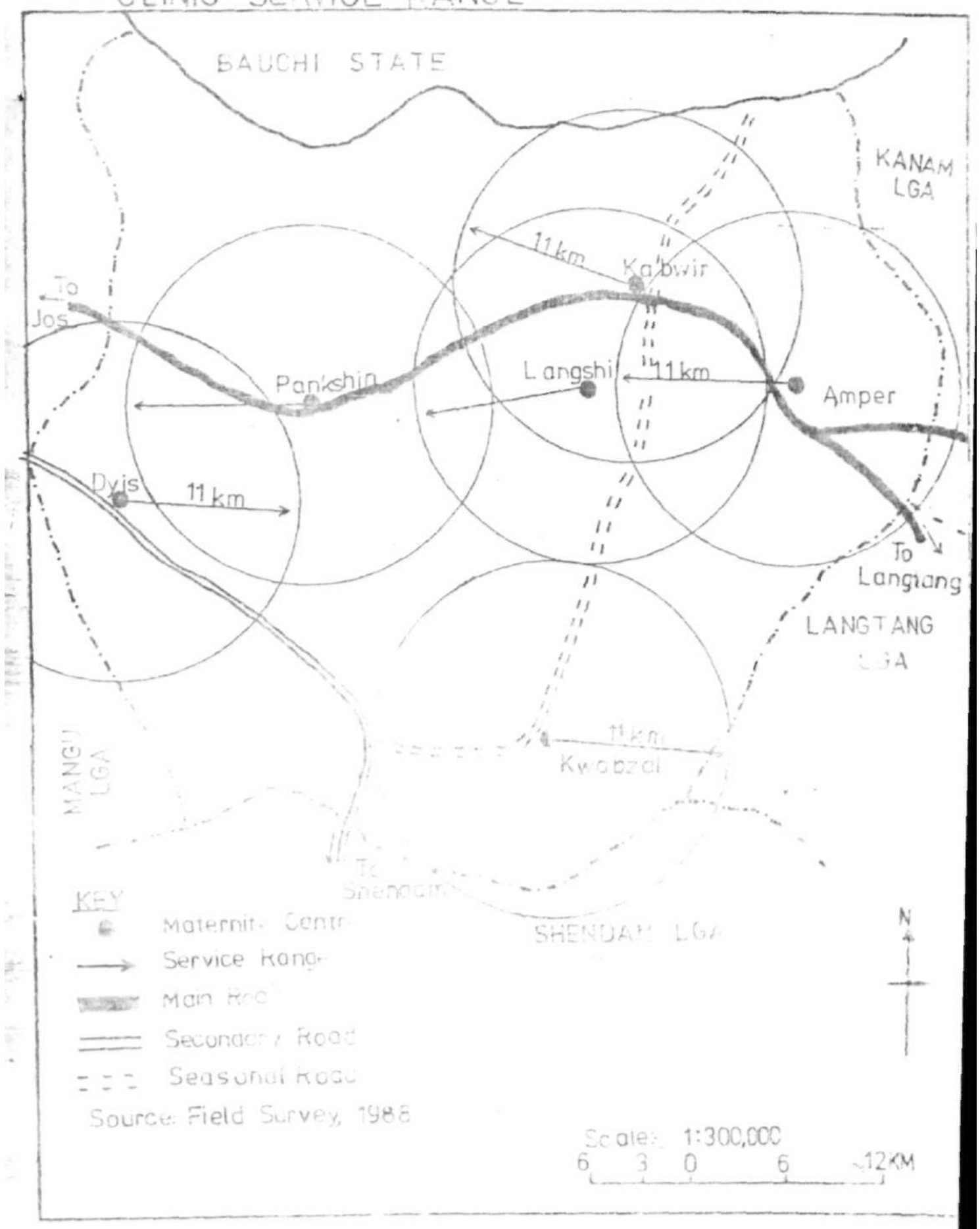


FIG 7.2 : PANKSHIN LGA: PROPOSED MATERNITY CLINIC SERVICE RANGE

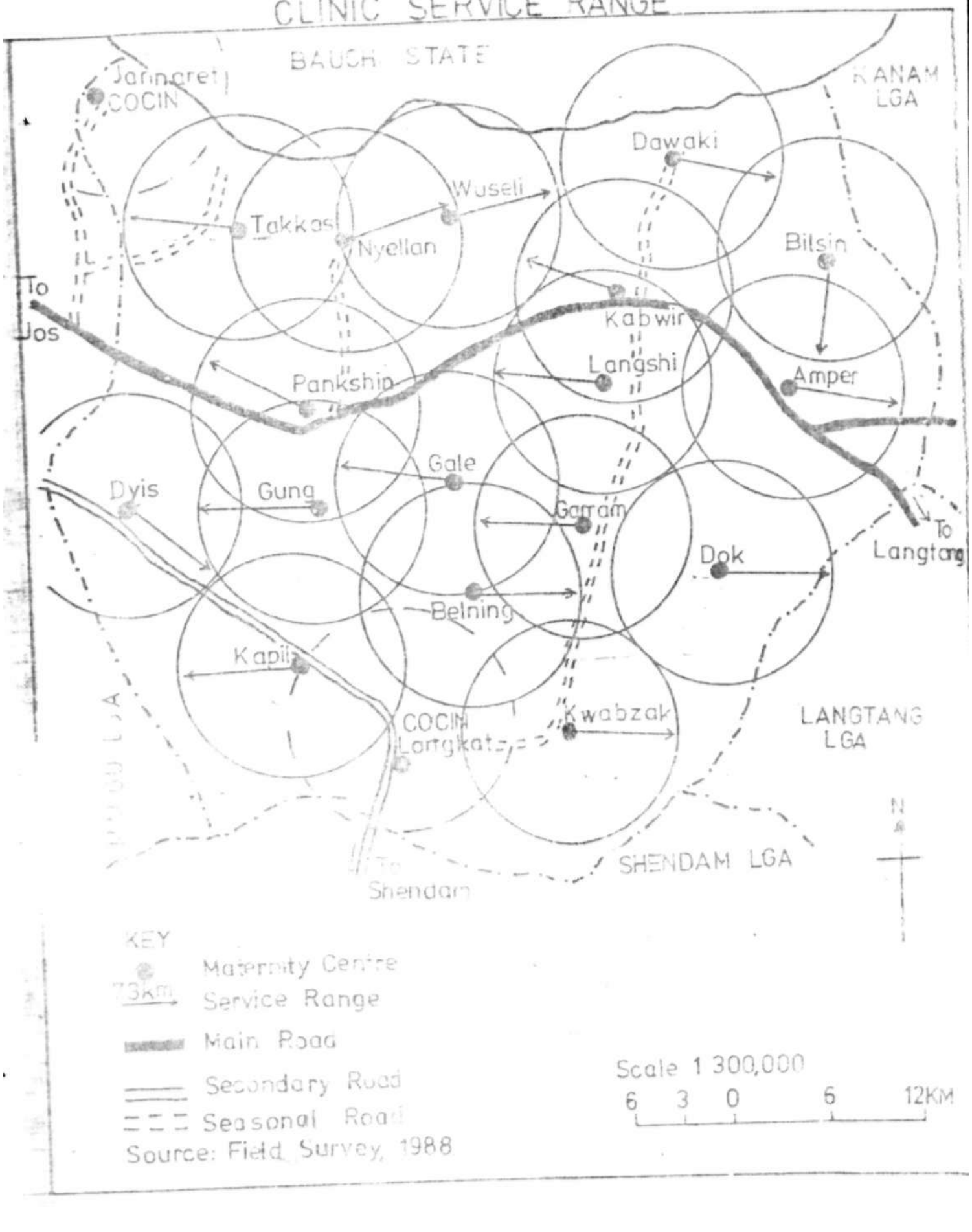


FIG. 7.3c PANKSHIN LGA: EXISTING DISPENSARY SERVICE RANGE

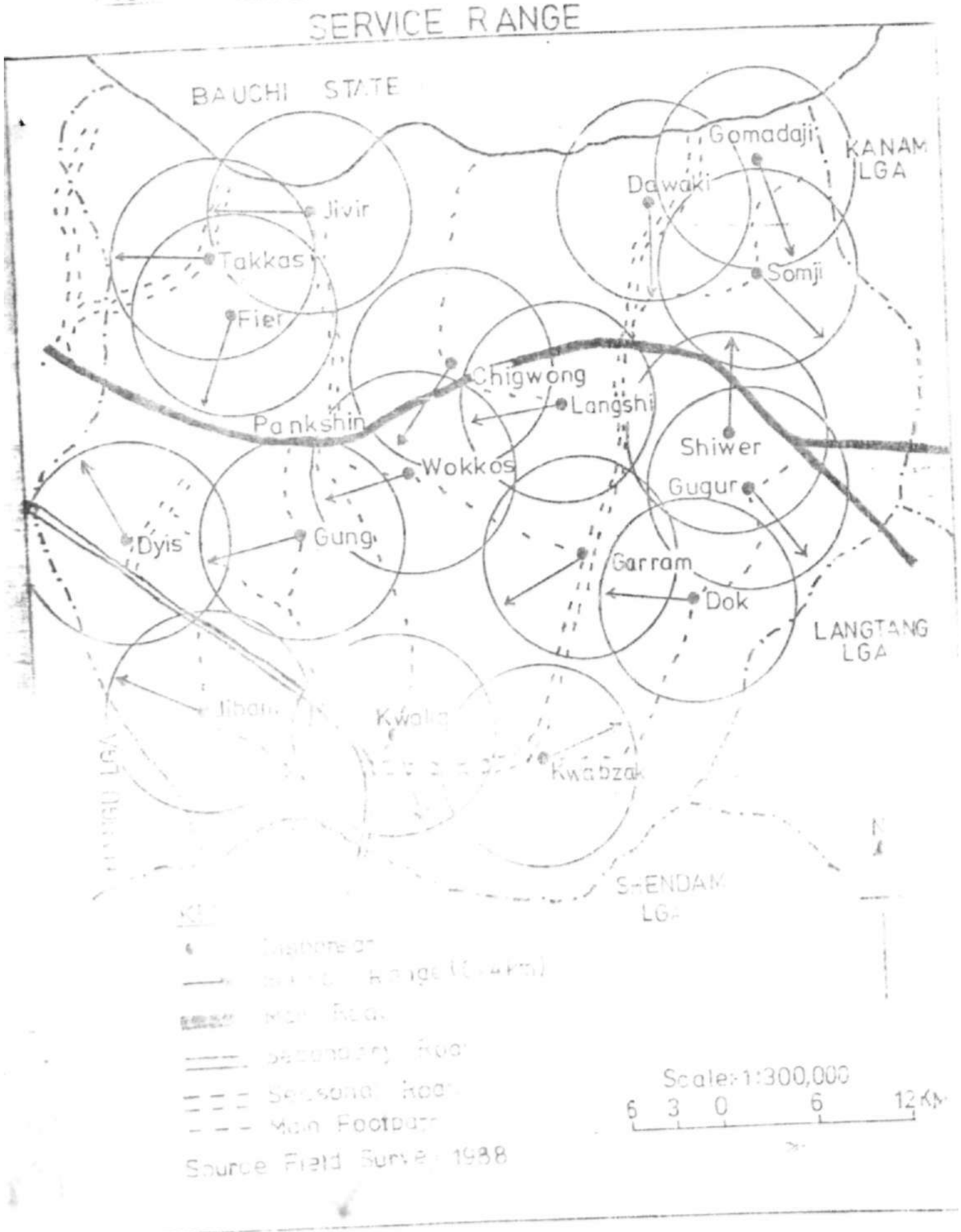
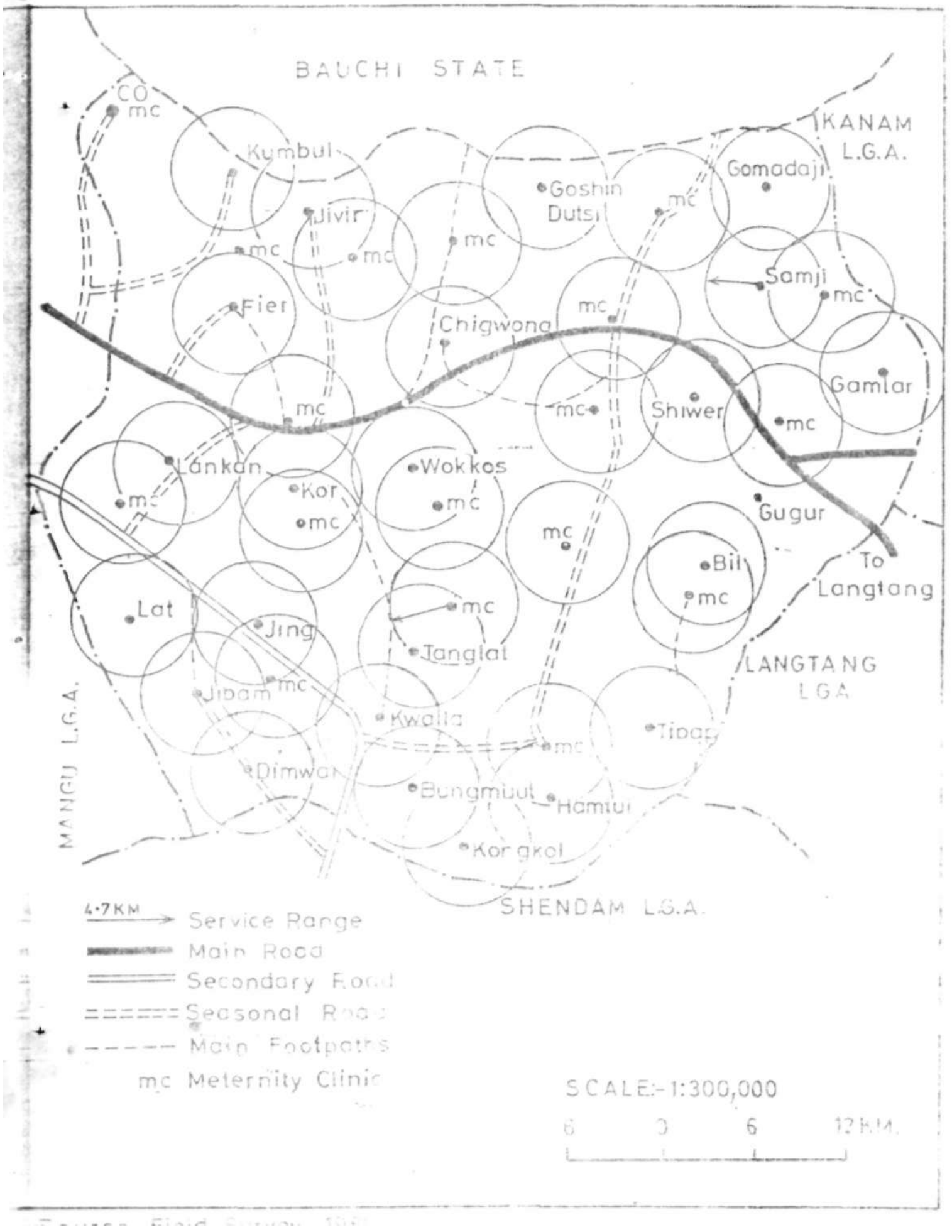


FIG.7-3b PANKSHIN LGA: PROPOSED DISPENSARY SERV. RANGE



Source: Field Survey, 1987

providing the minimum number of individual services at any centre, it is therefore regarded as underutilized. The yearly case load for individual services demanded by the people in the area should not exceed 344143.5. If a doctor offers services to sick people and sees referrals from the cottage hospitals and maternity clinics it means attending to 1147 patients per day if there are 300 working days per year for a doctor. This is impossible. Assuming that a doctor spends 10 minutes per patient and works 12 hours daily therefore the number of visits a doctor will attend to a day is 72 patients. If 1147 patients are to be attended to daily then the number of doctors recommended for the LGA is 1147 ÷ 72 = 16. It is therefore recommended that Pankshin LGA needs 16 doctors for effective provision of health services to the entire population. It is therefore recommended that the referral hospital at Pankshin should have eight resident doctors and one each for the cottage hospitals.

The number of nurses needed to be posted will also be computed as the case of doctors. Assuming that a nurse spends 30 minutes per patient, works 12 hours daily in 300 working days the number of patients a nurse will attend to a day is 24. If 1147 patients are to be attended to daily then the number of nurses required

by this proposal will be 114 ÷ 24 = 48, reduction from the original 54 currently serving in the hospital at Pankshin. The 48 nurses will be shared as 28 nurses for the referral hospital and five each for the cottage hospitals.

Proposing a number of midwives for the clinics and hospitals is based on the number of child-bearing women and children under five years. Assuming a crude birth rate (CBR) of 43 per 1000 (4.9 children per wife, Field survey, 1988) for the study area, then the number of child bearing women will be 229429 x 0.43 which is 98654 child bearing women in a population of 229429 during the study period. An average woman makes only two prenatal visits a year (WHO 1978a), and if there are 300 working days per year, then there would be 658 maternal care visits per day. Given these assumptions that there would be 20075 children 0-11 months in the population (Field survey 1988). If each visits a clinic four times per year (with three of such for immunization) and if there ar 27282 children aged 12-35 months each makes two visits per year to the clinic then there would be 134864 annual child-care visits or 450 visits per day. The grand total of daily patients to maternal and child well-fare clinic will be 1108 (both pregnant women and children under five years). Assuming a midwife spends

30 minutes per patient and 12 hours daily, then 24 patients will be treated. Therefore 46 midwives are proposed for the LGA and shared as 20 for the 10 clinics, 16 for the four cottage hospitals and 10 for the referral hospital. In all the hierarchy of the health care structure the traditional birth attendants will be incorporated into the system.

A dispenser is a health personnel who gives out medicine in prescribed doses to patients in hospital or any health centre. But in this context he is a person who runs a small health centre in a rural area, treats minor cases and refers major cases to maternity clinics, cottage hospital or a specialist hospital.

The number of dispensers to man the dispensaries will be computed as the case of other health personnel. Assuming that a dispenser spends an average of 20 minutes per patient including his home visits to the inhabitants for some health education, advice and sanitary inspections, works 12 hours daily in 300 working days per year, the dispenser will attend to patients daily. Therefore the number of dispensers needed to attend to 1530 patients daily is 1530 ÷ 36 = 43.

The distribution of the dispensers will be one each to a dispensary while the dispensaries located in very harsh environment will have extra one each. The harsh environment here refers to areas that are very remotely located in rugged hills. The rationale for allocating two dispensers is that when any of them could be in the dispensary, while the other would be on home visits.

7.1.3 Training of Health Manpower for Modest Health Care Service Delivery System

For the implementation of this proposal there should be a training programme for the health care activities in all the levels.

7.1.3.1 Training of Health Auxiliary Staff

The [illegible] care system would need staff to run the dispensaries effectively. Therefore, such workers are to be recruited at health dispensers and are to undergo a one-year community health course offered by the School of Health Technology, Kenyatta. After training they are to be posted to work in the rural dispensaries preferably in their localities.

7.1.3.2 The Role of Traditional Practitioners

In Pankshin LGA, there are several traditional practitioners in almost every rural community who treat various illnesses using local herbs. The most popular traditional practitioners are the traditional birth attendants in every village whom the rural population depend for maternal and child care services; and the bone setters who treat some fractures.

These health practitioners are recommended for full integration into the modest health care system in order to tap the good aspects of their services especially their herbs and skills in handling health problems. When these health personnel are fully integrated they should be given some training in some aspects of the modern health care system so that they would be conversant with the modern health care delivery system. Training could be on-the-job basis using the local dialect and they too will be encouraged to teach the orthodox health personnel in certain methods of handling some health problems.

7.1.3.3 Training of Orthodox Health Personnel

The training of doctors, nurses and midwives would continue but more emphasis of the training should be on preventive measures and how they would use local resources in handling some health problems after completion of course. The health personnel in the category should be educated to respect and recognise the traditional doctors, nurses and midwives, to learn from and cooperate with them.

7.2 Preventive Health Care Services

Preventive health programmes should form a major component of a sound health care system. The preventive health care sector should have sufficient personnel as resources both externally or within the rural communities. The following have been proposed for the rural areas of Pankshin LGA.

7.2.1 Communicable Disease and High-Risk Surveillance

This programme has as its objectives the visiting of each household in the community at least four times a year. Because of the remoteness of the study area in terms of the terrain the surveillance itself can be done by trained villagers from the various communities.

For effectiveness of this programme, the number of the village workers needed is determined by workload analysis. For example, each worker is to visit eight households a day and about 18,354 households exist in the study area (i.e. using the average of 11.5 members in a household chapter 5), then one surveillance worker could visit 440 households in a quarter of a year (i.e. eight households per day x 55 working days in one quarter = 440 households). The number of workers needed for effective disease surveillance, then is 18,354 ÷ 440 = 42 workers. This is the number of indigenous workers required to provide disease surveillance services to the rural communities of Pankshin LGA.

7.2.2 Ø<u>Immunization Programme</u>

As analysed in chapter four this exercise has been overconcentrated in certain locations of Pankshin LGA at the expense of other areas because of lack of personnel and other facilities. The main aim of the programme is to immunize the children under five years and expectant mothers (i.e. about 75% of the household members, chapter five which is about nine persons are susceptibles in the household). For effective coverage of the target population then the workload is 75 x 229429 ÷ 100 = 172072. In a well-developed health care

delivery system, the worker should be able to visit and attend to about 16 households per day. If each household requires three visits (especially for Polio and DPT, chapter four) to complete the immunization services then each worker can cover 1200 households per year (i.e 16 x 5 days x 15 weeks). Therefore 15 vaccinators would be required to cover 18,354 a year compared with the existing six vaccinators stationed in Pankshin and are expected to cover the entire population (Field Survey, 1988). These vaccinators are proposed to be distributed among the proposed 10 maternity clinics and hospitals from which they operate their home visits in the rural areas. After the first year, all households should have been visited once a year to find children born in the last year but whose mothers have not brought them to the maternity clinic to receive immunizations, and to find new families in the community. Both workers should be drawn from the communities and sent for a short course in this aspect of health care service and posted back to their homes after completion.

7.2.3 School health programme

This is to offer vision and hearing tests to the school children and surveillance for selected infectious diseases. Each school should be visited quarterly, and

each visit should take one day, but this is completely lacking in the health programme in Pankshin LGA.

7.2.4 Safe-Water Programme

A community should be encouraged to sink a community borehold or individual household to sink deep wells. Though this is a programme that could be difficult to be achieved in this area, but the way out is that the local government authorities should enforce some token levies for the sinking of boreholes in the rual area. However, the various arms of the government can contribute their quota in construction of dams in some areas that are hard hit by shortage of water supply every year. These dams should have some control measures against simulium habitation and oviposition sites for the simulium.

However, for an effective safe-water programme, to have safe sources is not enough. It is necessary to ensure safe storage and safe use of the water in the rural areas. This therefore requires a community health education programme in which each household receives water safety education through the dispensers during their home visits.

7.2.5 Safe-Latrine and Waste Disposal Programme

This is to encourage and make households to have safe latrines and safe waste disposal system. Construction of safe pit latrines would require one day per household, and would require maintenance of such latrines and waste-disposal safety through inspection programmes for those households in which latrines are not well maintained and wastes are poorly disposed of. The inspections, should be carried out by the various dispensers in the rural communities.

7.2.6 Health Education

This should be a component of all services provided within a community on child care, nutrition, personal hygiene and encouragement in environmental sanitation.

7.3 Phasing of the Establishment of Health Care Service Centres in Pankshin LGA.

The implementation of the proposed number of health care services centres are expected to take place within a period of five to ten years though as the years progress the population of the study area will also increase. However the proposed number of health care services centres are meant for immediate implemenation,

but in any case some of the health care centres will be accorded top priorities as revealed by the findings in this study. The implementation of the proposal will be executed as follows:

(i) Building of the six new dispensaries (1989-1991) to give a total of 24 dispensaries to serve a population of 235,165 by 1991, i.e. one dispensary per 9,799 persons. However by the year 2000 AD, 21 new dispensaries will be required to give a total of 45 dispensaries in order to cover an entire population of 308557 at one dispensary per 6,748 persons.

(ii) Building of the four new maternity clinics (1989-1991), to give a total of 10 maternity clinics to serve a population 235,165 by 1991 i.e. one maternity clinic per 23,517 persons. By the year 2000,19 maternity clinics will be needed to give a ratio of one maternity clinic to 16,388. i.e. nine new ones will be required.

(iii) Building of two cottage hospitals (1989-1991, and the other two (1992-1993). By 1993 there would be four cottage hospitals to serve the entire population of 259,578 in the area.

(iv) Expansion work on the general hospital at Pankshin in preparation for the upgrading to referral hospital (1990-1995). This referral hospital will be the only one up to the year 2000 because it is assumed that by this time at the primary level, i.e. the dispensary and maternity clinic levels, most of the preventable diseases should have been eradicated. It is further envisaged that the policy on the western model of health care delivery system would have been reorientated towards the utilization of local resources and preventive care rather than curative care.

(v) Preventive health care services programme is to take off immediately and will become more progressive until the preventable diseases are completely eradicated in the rural area.

7.4 Institutions to be Responsible for the Various Projects of the Modest Health Care Delivery Systems

All the arms of government with the active community participation will be heavily engaged in the execution of the projects.

7.4.1 Community Participation

With the aim of increasing good health status and getting rid of health problems in rural areas in particular

and the nation in general, community involvement in the implementation of the proposal is one of the principal strength and supports in rural health care service delivery system. Through the various Community development associations and other organizations in every district and the Pankshin Local Government Development Association (PLADA) the rural communities will be mobilized to build the six new dispensaires proposed for the LGA.

The communities would provide some materials, funds, labour and other support for the execution of the six dispensaries projects. The Pankshin Local Government Development Association is to supervise and monitor each district development association in the execution of the projects.

Each rural community in the area is also to participate actively in the disease control programme through environmental sanitation, safe and efficient waste and refuse disposal system, clearing of the surroundings of the compound to rid off flies and mosquitos. The village heads are to be mobilized to ensure that each household should have a pit latrine which is easy to be done through household labour.

7.4.2 Local Government Participation

The local government through the Health Department is to supervise the execution of the dispensary projects in the various rural communities. The local government is also to monitor the level of environmental sanitation in the rural areas and also to ensure that some health educators guide the rural inhabitants in some aspects of health.

The local government is therefore with the community to maintain these dispensaries and the former to pay the dispensers their stipends.

The proposed maternity clinic projects with the active community participation are to be executed by the local government. The staff of these health care centres are to be maintained by the state government through the Ministry of Health.

7.4.3 The State Government

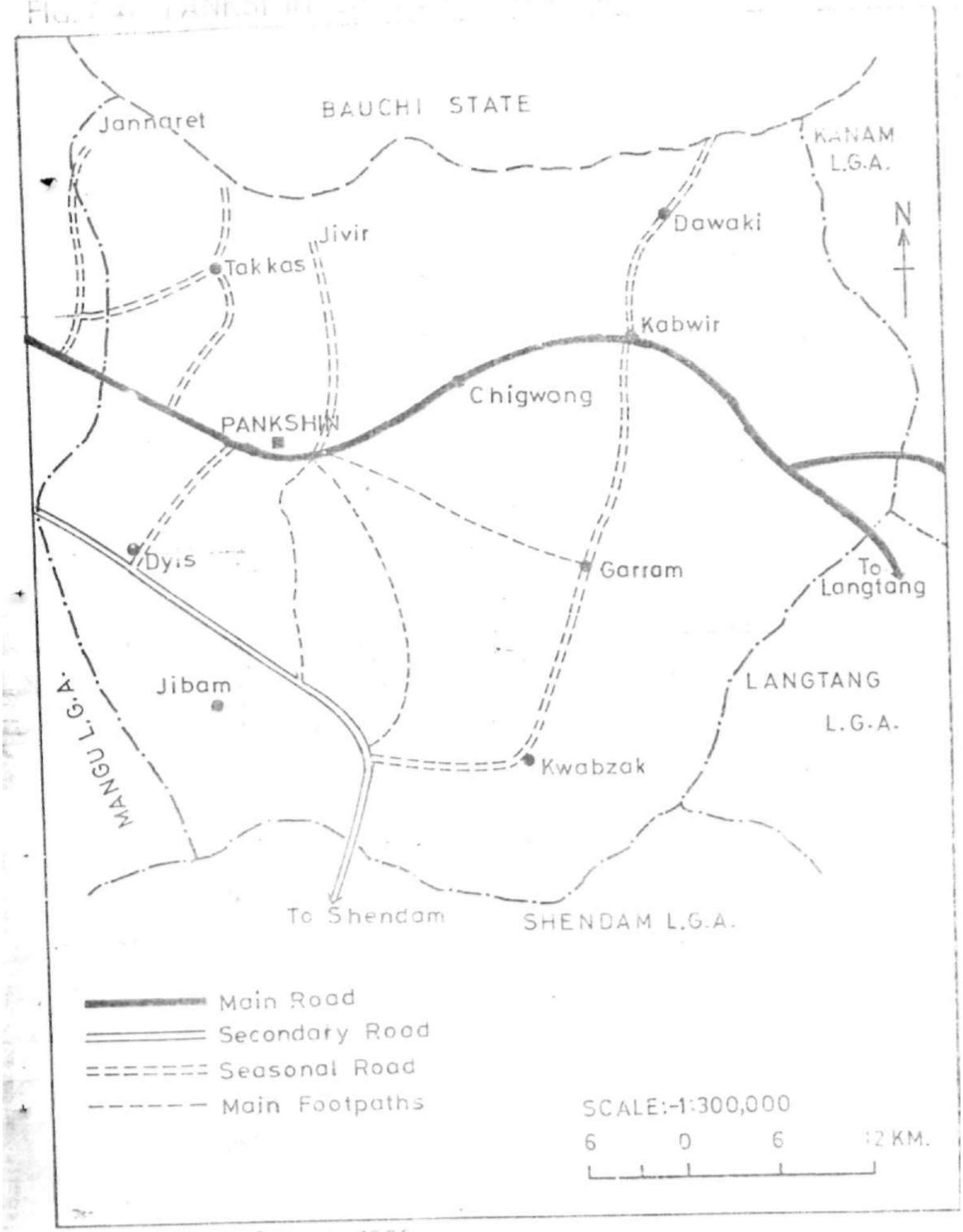
A cottage hospital seems to be more expensive than others for execution, but, however with the participation of the rural communities and local government, the state government is to execute the cottage hospital projects.

It is further envisaged that state government should expand the general hospital at Pankshin and install some facilities that would make the hospital to produce essential drugs locally in order to supply other centres and to save the government expending huge sums of money in importing drugs. In the interim the state government should import only essential drugs in order to save some money for other health supporting services as provision of potable water supply and transportation networks in the rural areas.

The staffing of the hospitals and supplying of drugs would be the responsibility of the state government. Again the state government is to supervise and monitor the activities in all levels of the health care structure.

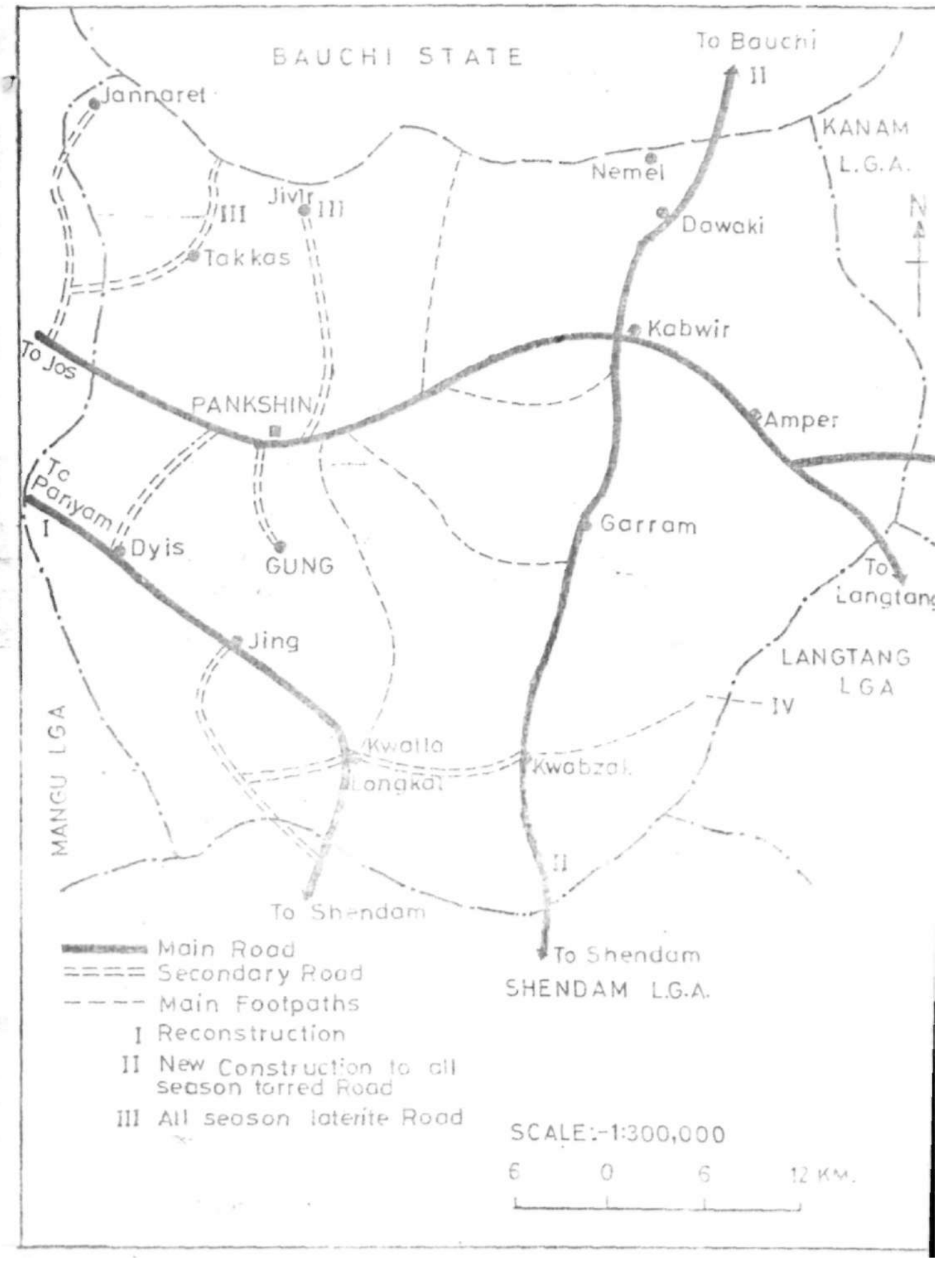
7.4.4 Federal Government

The transport networks in Pankshin LGA are very appalling hence some seasonal roads have been proposed for construction. The construction of two major seasonal roads are proposed to be constructed by the Federal Government. These roads are Shendam-Panyam-Jos and Shendam-Kwalzak-Kanwar-Bauchi. See Fig 7.4. Some major footpaths are earmarked for construction.



Source:-Field Survey, 1988

FIG.7·4b PANKSHIN LGA: PROPOSED ROAD NETWORK IMPROVEMEN



These are proposed for the directorate of Food, Road and Rural Infrastructures (DFRRI) to construct. The construction of these roads will not only facilitate the movement of the rural inhabitants to health centres alone but to other service centres especially markets.

7.4.5. Private Sector

Private individuals and corporate bodies are also to be encouraged to establish health care service centres in the rural areas of the LGA like the Church of Christ in Nigeria (COCIN) Rural Health programme.

7.5 Proposed Health Care Teams for Effective Coordination and Supervision

For effective health care service delivery system, there is a need for health care teams that would supervise and coordinate the activities of the levels of the health care system.

7.5.1 Village level health team consists of

1. Village head
2. Clergymen
3. Village development Association Leader
4. Traditional Practitioner

7.5.2 District Level Health Team (Members)

1. District Head
2. Medical officer in charge Cottage Hospital
3. District community Association Leader
4. All Village heads
5. Dispensers in the District
6. 6 Nurse/midwife
7. Voluntary Organization Leaders
8. Women Organization Leaders
9. Traditional Practitioner.

7.5.3 LGA Health Team (Members)

1. Commissioner for Health
2. Paramount Chief of Pankshin LGA
3. Medical Officer in charge Referral Hospital
4. Community Health Officer
5. Chief Nursing Officer.
6. Public Health Officer
7. Pankshin Local Government Development Association Leader.
8. All Medical Officers in Charge Cottage Hospitals
9. A Traditional Practitioner.

This section on health teams to monitor and supervise the health care delivery system ends this chapter on a proposal of a modest health care service system, while the next chapter discusses briefly some recommendations on how to improve the socio-economic status of the rural inhabitants of Pankshin LGA. The chapter further gives the summary and conclusion of the study.

CHAPTER EIGHT

SUMMARY AND CONCLUSION

8.1 Summary

The phrase "health for all by the year 2000" is a call for equity in the health care delivery system. In addition to the more customary measures of effectiveness and efficiency, equity introduces a new parameter for measuring the appropriate outcome of health budget expenditures and socio-spatial coverage. Innovative approaches to gathering information are needed to monitor health service coverage in a way that will identify the groups whose needs are greatest and least served.

The provision of a truly effective health care service to the rural majority requires a change of orientation in government policies, the health personnel and the health system as a whole. The health service network whose mesh is too large and whose personnel often restrict themselves to purely curative activities for the benefit of the urban population, as is the case in the study area requires drastic changes. Again the health system here is one in which dialogue appears impossible between a rural population group that does

know how to express its requirements and the system does not appear to acknowledge and to respond to the health problems of rural inhebitants. So a serious reorientation of the whole health care system is needed.

Quite apart from these shortcomings the health care delivery system seems to neglect the mobilization of the local resources for effective service that would cover the entire population. Historically, over a long period, traditional medicine or traditional community health care has created the resources and procedures appropriate to local conditions and culture and less expensive in terms of drug procurements, if improved upon in terms of hygiene. The incorporation of traditional health care system into the national health care system would prove very useful in this country where there is gross maldistributribution of health personnel, drugs and other health care facilities. It would appear to be futile for a developing country such as Nigeria to continue on the ortnodox or western approach to health care delivery since it lacks the necessary financial, human and organizational resources which would enable it to train enough fully-fledged medical personnel that would cover the entire population effectively.

Generally speaking, the epidemiological data from the study area show that these diseases that could be prevented if resources are invested in the provision of basic social amenities which will improve the quality of life, mass immunization, environmental sanitation, disease control and surveillance, and in health education programmes. It is quite pathetic to note that, with the myraid of health problems in the rural areas and the inaccessibility to and inability of the rural inhabitants to utilise the modern health care system effectively, 61.5% and 85.6% of the Federal and Plateau state ⁄ total budget respectively for health in the Fourth National Development Plan 1981-1985 were allocated to curative rather than preventive programme as illustrated in Table 8.1.

Table 5.1

Functional Analysis of the Allocations of Capital Expenditure on Health Programme 1981-1985, Federal and Plateau State Governments.

Health Programme	Federal ₦(million)	% ₦(m)	Plateau state ₦(million)	% ₦(m)
Curative service (Hospital programme)	735.00	61.5	83.42	85.6
Preventive services	58.00	4.9	1.0	1.0
Training Programme	240.00	20.1	10.5	10.8
Others (Quarantine stations - Lagos, Kano, P. Harcourt, Calabar etc)	162.5	13.5	Central Store 2.50	2.6
Total	1195.5	100.0	9..42	100

Source: Compiled from the Fourth National Development Plan 1981-1985 Vol II pp. 753-760 and 817-19

The data in the table clearly suggest that the urban-based health facilities which serve as the sources of care for a small minority in the population absorbe a disproportionately huge amount of the funds allocated to the health sector. In addition, the data reveal that curative rather than preventive measures also consume much of the resources in a place where the major causes of morbidity, disability and mortality could be prevented. This finding therefore suggests that there is an urgent need for a reorientation in the development of the health sector in general and other health related

service. The representation must take the reality of the population of the country into consideration and ought to take the well-being of a majority rather than a very small proportion of the population into due account.

Like many other LGAs in Plateau state this study shows that there are gross variations in the distribution of health care services and facilities that will adequately and effectively cover the rural areas. Again the LGA is highly handicapped in transportation networks that would facilitate easy movement of the rural inhabitants from their localities to the service centres. This further worsens the health conditions of the rural inhabitants in this region.

The study has established that health care centres are grossly inadequate and that there is the scarcity of the health personnel that would effectively deliver the services to the entire population of the area. Because of that phenomenon the rural communities have to seek other means to solve their health problems while they found the traditional health care system.

The study further establishes that there are strong associations between socio-economic status of the people and accessibility to and utilization of medical

care services. It further shows that the establishment of specialist health care system would only serve the minority elite group and the urban dwellers at the expense of the rural inhabitants. It is revealed from the study that health supporting services are conspicuously lacking or absent in the rural areas. These services if include basic health education, potable water supply, electricity and waste disposal system.

8.2 Conclusion

Unless and until there is a total policy reorientation, an identification and clear assessment of needs and the ~~xxxxx~~ monitoring of programmes directed to meet those needs on the widest possible scale, existing health provision will remain poor and more polarized ~~x~~ towards the urban sector - the 'urban rich'. Health care service for the entire population should be conceived as part of an overall national development plan. It is necessary to remember that diseases and adverse health conditions which arise or are maintained in rural communities through defects in the social, economic, cultural and environmental situations cannot be removed or kept permanently under

control unless those defects are themselves corrected.

The most obvious way to correct the defects in the present health care system in the rural environment like Pankshin LGA is to embrace a policy of social justice in the provision of health care services. Such a health care delivery should be:

(a) geographically comprehensive i.e. it should be able to cover the total area for which, it is meant.

(b) to cover the total population irrespective of the socio-economic status;

(c) continuous i.e. the continuity of patient's treatment over a period of time, when different personnel may be involved in the same case depend on good medical records; and

(d) provided with adequate supporting services.

6.3 Towards Raising Socio-economic Status of the Rural Inhabitants in Pankshin LGA.

Some recommendations are briefly proposed to raise the socio-economic status of the rural inhabitants since it has been demonstrated in this study to be a major handicap to better health.

(1) Mass literacy programme is very essential in the rural areas because it has been established by the study that there is a strong association between literacy level and health problems. This programme will help immensely in creating awarness in the rural communities of the major causes of health problems and how to tackle the causes rather than the symptoms. It will further improve the environmental sanitation of the rural communities and dietary intake.

(2) Better methods of food storage and preservation, improved methods of food preservation and storage can maintain the nutritional value of stored food, prevent food poisoning and sicknesses associated with the consumption of spoiled food and help eliminate the off-season hundry months.

Improved and adequate diets among the rural inhabitants will mean improved body resistance to diseases and increased labour productivity on the farm and other economic activities.

(3) Inadequate marketing and transport facilities, and uneconomic and unpredictable prices are generally the major bottlenecks to increasing rural income. Improving the means of transport and communications is

critical for improving performance of traditional trade channels which consequently improve the income of the rural inhabitants through the sales of the agricultural products.

(4) Provision of water supply is a case in point. It has been noted in the study that if water supply were within reach of households, it would significantly reduce the amount of time spent to procure water. This would also improve the personal hygiene of the rural inhabitants.

8.4 Suggestion for Further Studies

Because of time, financial and other resources constraints this study has not been able to make in depth research into the strong association between socio-economic status of the rural inhabitants in various locations in the state and the major health problems. There should be therefore government sponsored researches into the major health problems in rural areas in Plateau state in order to raise the socio-economic status of the rural inhabitants in the state and the nation in general. Researches should be conducted in specific diseases in order to evolve a viable means of eradicating the vectors, especially mosquito, simulium, snail and flies, that constantly

threaten the health conditions of the rural dwellers and the urban poor. This is however to alleviate the sufferings of the rural communities so that they too can contribute meaningfully to development programme of the country.

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APPENDIX A

HOUSEHOLD QUESTIONNAIRE

The information required here is purely for academic purpose. Respondents' [illegible] information shall be treated as [illegible].

Tick ☐ where, where written information is required, filled in the space provided.

Date of Interview .....month.....19....

Location of Interviewer (Name of Village.....

District.....

PART I. SOCIO-ECONOMIC BACKGROUND AND DEMOGRAPHIC CHARACTERISTICS

1. Name (optional).....

2. How old are you? (a) Under 30years ☐
(b) 30-39 ☐ (c) 40-49 ☐ (d) 50-64 ☐
(e) 65 and over ☐

3. Are you (a) single, (b) married, (c) widower, separated or divorced?
(a) single ☐ (b) married ☐ (c) widower ☐
(d) separated ☐ (e) divorced ☐

4. If you are married, (a) How many wives do you have?
(a) 1 ☐ (b) 2 ☐ (c) 3 ☐ (d) 4 ☐
(e) Over 4 ☐

5. If you are single (bachelor) or divorced, how many children do you have? (a) None ☐
(b) 6-9 ☐ (c) 10-15 ☐ (d) 16 and above ☐

6. How many of your [illegible] age of 2years? (a) none [ ] [illegible] (c) 3-5 [ ] (d) over 6 [ ]

7. How many of your [illegible] the age of 2years? (a) [ ] [illegible] (c) 3-5 [ ] (d) over 6 [ ]

8. If you are widowed, what was the cause of your wife's death? (a) sickness [ ] (b) accident [ ] (c) when giving birth [ ] (d) other, specify:.....
.....

9. How many persons are currently living in the household?
(a) 1-5 [ ] (b) 6-10 [ ] (c) 11-15 [ ]
(d) 16-20 [ ] (e) 21-25 [ ] (f) above 26 [ ]

10. What is your religion? (a) Traditional [ ]
(b) Christianty [ ] (c) Islam [ ] (d) Other, Specify:.....

11. Did you attent any school? (a) Yes [ ] (b) No [ ]
If "yes" what type? (a) Western education [ ]
(b) Koranic school [ ] (c) both [ ]

12. How is your [illegible] occupation? (a) farming [ ]
(b) traditional [ ] (c) cattle rearing [ ]
(d) civil [illegible] [ ] (e) other.....
.....

13. How many animals [illegible] household as a whole? specify number of: [illegible] (c) [illegible] [ ]
(c) sheep [ ] [illegible] [ ]
(f) [illegible] and donkeys [ ]

14. What is your household [illegible] monthly consumption of, (specify number) [illegible] eggs [ ] [illegible] chicken [ ]
(c) [illegible] [ ]

15. What is your [illegible] consumption of [illegible]
(a) goats ☐ [illegible] ☐ [illegible] ☐
(d) sheep ☐ [illegible] ☐ [illegible], others,
specify.....

16. In the household [illegible]
(a) father ☐ [illegible] ☐ (c) children ☐
(d) all members ☐

17. In the household meat and eggs are eaten on special occasions. (a) Yes ☐ (b) No ☐
If "yes" which of the occasions: (a) traditional festivals ☐ (b) Christians time ☐
(c) Sallah time ☐ (d) as treatment to certain sickness ☐ (e) visitors ☐

18. Which crops do you prefer as your normal staple and eatin most often by the household? (a) yams ☐
(b) guinea corn ☐ [illegible] ☐ (d) rice ☐
(e) [illegible] ☐ [illegible] ☐

19. [illegible]
(a) [illegible] (b) ☐
(c) [illegible] ☐

20. [illegible]
[illegible]

21. [illegible]
(a) 1 [illegible] ☐ [illegible] (b) 2-3 members ☐
(d) 4 [illegible]

22. Every room has (a) window ☐ (b) 2 windows ☐
(c) 3 windows ☐ (d) none ☐

23. The houses are built [illegible] (a) [illegible] (b) cement bricks [illegible] and cement bricks ☐

24. Are there some [illegible] and rodents in the compound that disturb [illegible] members of your household?
(a) Yes ☐ [illegible] ☐
If "yes", [illegible] (b) bedbugs ☐ (c) cockroaches ☐ (d) mosquitoes ☐
(e) rats ☐ [illegible] ☐

B. *SEWAGE AND REFUSE DISPOSAL*

25. What type of latrine do the members of your household use? (a) bush ☐ (b) pit-latrine ☐ (c) water-seal latrine ☐

26. Where do the members of your household bath?
(a) streams/ponds ☐ (b) bathroom ☐ (c) well site ☐

27. How many times do the members of your household bath?
(a) once a day ☐ (b) twice a day ☐ (c) every-other day ☐

28. Where do the members of your household wash their clothes? (a) latrine ☐ (b) streams/ponds ☐ (c) well ☐

29. Where [illegible] sweepings deposited?
(a) just [illegible] compound ☐ (b) in the bush away [illegible] ☐

C. [illegible]

30. Where do [illegible] household get water for domestic [illegible] (a) river ☐
(b) streams ☐ (c) well ☐ (d) pipe ☐

31. How long do [illegible] members of your household to obtain water? (a) 1-20 minutes ☐ (b) 21-40 minutes ☐ (c) 41-60 minutes ☐ (d) 61-80 minutes ☐ (e) 81-100 minutes ☐

PART III: HEALTH [illegible]

32. Within your own [illegible] nearer to your [illegible] (a) local government Dispensary ☐ (b) general hospital ☐ (c) School run [illegible] Dispensary ☐

33. How many kilometres is the health centre away from your residence? (a) 1-5 ☐ (b) 6-10 ☐ (c) 11-15 ☐ (d) 16-20 ☐ (e) 20 and above ☐

34. When the need arises, which of the following means of transport do you use to the health centre? (a) on foot ☐ (b) by motor vehicle ☐

35. If "on foot" it is because (a) there is no motor to the area ☐ (b) too near to the health centre ☐ (c) no money to buy the transport ☐ (d) vehicles visit the area once or twice a week ☐ (e) roads become very muddy in the rainy season for vehicle ☐

36. If the [illegible] health area is a distance [illegible] from your residence (a) [illegible] ☐ (b) 5-7km ☐ (c) [illegible] ☐ (d) [illegible] ☐

37. From your [illegible] the hospital location conveniently [illegible] ☐

38. With [illegible] you seek any health help [illegible] ☐ (b) [illegible] ☐

39. If [illegible] you consider a [illegible] of the [illegible] most ☐ (b) [illegible] ☐

40. If "never" [illegible] (a) There was no money [illegible] the service ☐ (b) The dispensary/hospital is too far away ☐ (c) Don't know ☐

41. If any of the [illegible] consultation, it [illegible] ..... (a) [illegible] (b) a check-up [illegible] [illegible] other reason), specify:..... .....

42. At that visit [illegible] it ..... (a) not [illegible] long [illegible] (b) [illegible]

43. If you waited [illegible], it was because ..... (a) the doctor/dispenser/nurse was not there [illegible] (b) there was only one doctor/nurse/dispenser for many [illegible] (c) there were no other patients but he was doing some other job [illegible]

44. When you eventually saw the doctor/dispenser, in your own opinion .....
(a) enough time was given for the problem [illegible]
(b) not enough time was given for the problem [illegible]

45. While with the doctor/dispenser/nurse, did he .....
(a) give you [illegible] (b) ask you to go to another hospital [illegible] (c) arrange for you to be admitted [illegible] and by the nursing sometime [illegible]

46. When you [illegible] to the hospital, how long [illegible] you stay [illegible] (a) [illegible] (b) [illegible] (c) [illegible]

47. Were you [illegible] satisfied with the treatment [illegible] [illegible] [illegible]

48. If you [illegible], would you [illegible] you [illegible] .....
(a) [illegible]
(b) not [illegible] animals, [illegible] at home? [illegible] (c) other reasons [illegible] comment:.....
.....

49. Have you or has any member of your household had any toothache? (a) Yes ☐ (b) No ☐

50. If "yes" did you seek advice about the problem (a) Yes ☐ (b) No ☐

51. If "No" to 50 it was because .....
(a) you do not know of any dental service ☐
(b) the dental hospital is too far away ☐
(c) no money for such treatment ☐

52. Have you or has any member of your household, had any sight problem? (a) Yes ☐ (b) No ☐

53. If "yes" did you have the eyes treated in any eye clinic? (a) Yes ☐ (b) No ☐

54. If "No" to 53, it was because .....
(a) eye doctor/hospital too far away ☐
(b) no idea they could be treated or tested in hospital ☐
(c) no money to pay for such service ☐
(d) don't trust eye hospital/doctors ☐

55. Within your area, is there any clinic for pregnant women to attend? (a) yes ☐ (b) no ☐

56. If "No" do you need one? (a) No ☐
(b) Yes ☐ If not why.....
.....

57. Does your wife go to the antenatal/maternity clinic regularly? (a) Yes ☐ (b) No ☐

58. If "no" it is because ..... (a) there is no money for the service ☐ (b) the clinic is located too far away ☐ (c) there is no need for such check-ups ☐ (d) it is against the religion ☐

59. Do you know of any [illegible] in your are or elsewhere? (a) Yes ☐ (b) No ☐

60. If "Yes" which [illegible] before the [illegible] medicine ☐ (b) [illegible]

61. Which of the following [illegible] to you that the other? (a) traditional [illegible] ☐ (b) modern medicine centre (hospital, dispensary) ☐ (c) none ☐

62. In your own opinion the following cases can best be treated with:

	Modern Medicine	Traditional Medicine
(i) Snake bite	☐	☐
(ii) Circumcision	☐	☐
(iii) Madness	☐	☐
(iv) Fractures	☐	☐
(v) Poison	☐	☐
(vi) Diarrhoea	☐	☐
(vii) Measles	☐	☐
(viii) Ante-natal care	☐	☐
(xi) Child delivery	☐	☐
(x) Lack of [illegible]	☐	☐

APPENDIX B

HEALTH CARE SERVICE INPUTS AND OUTPUTS

PART IIIA: HEALTH SERVICE [illegible]

(a) Hospitals .....

(i) Number of hospitals in the [illegible]

(ii) Manpower working:-

(1) Number of doctors.....

(2) Nurses:.....

(3) Midwives:.....

(4) Pharmacists:.....

(5) Dentists:.....

(6) Opticians/Optometrists:.....

(7) Anaesthetists:.....

(8) Laboratory Technicians:.....

(9) Radiographers:.....

(10) Theatre attendants:.....

(11) [illegible]:.....

(12) Physiotherapists:.....

(13) Other [illegible] attendants:.....

(14) [illegible] .....

(15) Others [illegible] .....

(ii) Facilities -

(1) Number of [illegible] .....

(2) Beds:.....

(3) Drugs:.....(a) adequate..... (b) inadequate.....

(4) Laboratory .....(a) adequate..... (b) inadequate.....

(5) No of Ambulances:.....

(6) Surgical Theatres:.....

(7) Water Supply ..... (a) adequate .....
(b) inadequate .....

(8) Electricity Supply ..... (a) adequate .....
(b) inadequate .....

(9) Surgical ..... (a) adequate .....
(b) inadequate .....

(10) Laboratory ..... (a) adequate .....
(b) inadequate .....

(11) X-Ray ..... (a) adequate .....
(b) inadequate .....

(12) Dental Equipment ..... (a) adequate .....
(b) inadequate .....

(13) Out-patients Department.....

(14) Children's Ward: .....

(15) Maternity Ward:.....

(16) Pharmacy Department:.....

(17) Administrative block:.....

(18) Dressing room:.....

(19) Delivery room:.....

HEALTH CENTRE Location..... District.....

Man power Working

(1) Number of Doctors:.....

(2) Nurses.....

(3) Dentists .....

(4) Midwives.....

(5) Pharmacists.....

(6) Opticians/Optometrists:.....

(7) Health Assistants:.....

(8) Anaesthetists.....

(9) Laboratory Technicians:.....

(10) Ward Attendants:.....

11. Clerks:.....

12. Dressers:.....Drivers:.....

13. Out-Patient [illegible].....Others, specify

.....

(ii) For [illegible]:

(1) [illegible].....

(2) Beds:.....

(3) Drugs:.....

(4) Theatre:.....

(5) Water Supply:.....

(6) Maternity Beds:.....

(7) Children's Cots:.....

(8) Delivery:.....

(9) Surgical Theatre/Equipment:.....

(10) Laboratory/ Equipment:.....

(11) Dressing Room:.....

(12) Pharmacy Department:.....

(13) Waste Equipment:.....

(14) Administrative Block:.....

(15) Others, specify:.....

.....

[illegible]

[illegible] Clinics in the study area

[illegible]:-

1. [illegible]ers:.....

2. [illegible].....

3. [illegible]ers:.....

4. [illegible]ers:.....

5. Cleaners:.....

Others, specify:.....

.....

(iii) Facilities:-

(a) [illegible]:.....

(b) [illegible] Equipment:.....

(D) Dispensaries: Location ..... District .....

(i) Number of dispensaries in the study area and Proprietorship.

(ii) Manpower Working:.....

(1) Number of Nurses:.....

(2) Midwives:.....

(3) Dispensers:.....

(4) Dressers:.....

(5) Cleaners:.....

(iii) Facilities:-

(a) Drugs:.....

(b) Emergency Bed:.....

(c) Obstetric Materials:.....

(d) [illegible]:.....

(E) Traditional [illegible]

(i) Number of Traditional Medicine Homes in the Study Area.

(ii) Manpower Working:-

(iii) No. of Herbalists.....; No. Helpers:.....

(iii) Facilities:-

(1) Wards:.....

(2) Drugs:.....

(3) Fuels:.....

(4) [illegible]:.....

PART IIIB: [illegible] OUTSIDE

Fill in the following information and will be treated as confidential.

(1) Number of admissions ..... per annum .....

(2) Patient Days:.....

(3) Outpatient Attendances:.....

(4) Deliveries attended to by qualified midwives:

.....

(5) Antenatal Clinic Attendances:.....

(6) Under-5 clinic attendances:.....

(7) Immunization:.....

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APPENDIX C

DISEASE STATISTICS FOR [illegible]

Please, kindly fill in the following information Every information will be treated confidentially.

Location of Health [illegible].....

A. Communicable Diseases

	Total Cases Reported	1986	1987
1.	Hookworm		
2.	Malaria		
3.	Diarrhoea		
4.	Dysentery (All types)		
5.	Onchocerciasis		
6.	Schitosomiasis (All types)		
7.	Conjunctivitis		
8.	Measles		
B.	Non-Communicable Diseases		
1.	Pneumonia		
2.	Abdominal Pain		
3.	Snake Bite		
4.	Malnutrition		
5.	Otitis Media		
6.	Toothache		
7.	Wound/Injury		
8.	Bronchitis		

1. Total number of patients treated in 1986 .....

   and in 1987: .....

2. Number of Laboratory Tests 1986 ..... 1987....

   Number of Deaths in the Area

   (a) Children in 1986 ..... and 1987

   .....

   (b) Adult in 1986 ..... and

   1987 .....

   Total number of births in the Area

   (1) In clinic:.....

   (2. Home Delivery:.....