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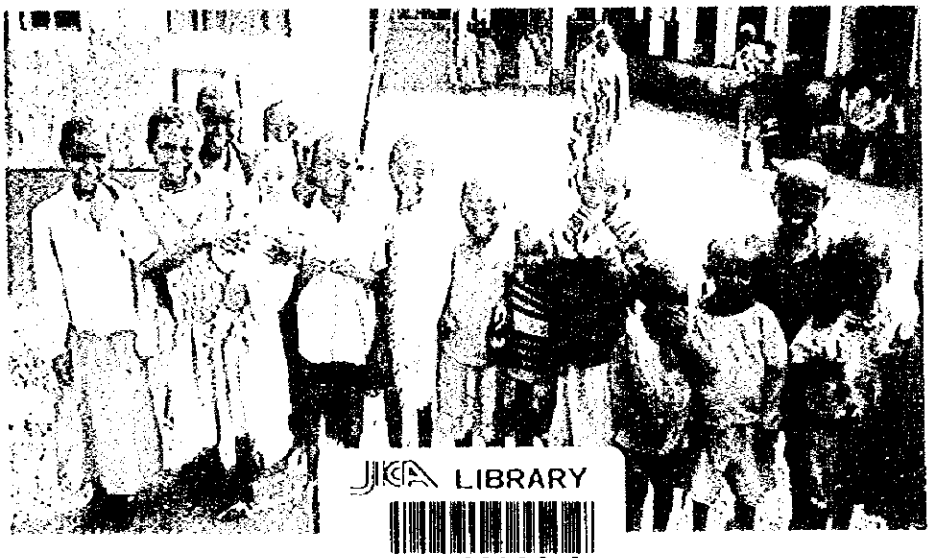
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE MINISTRY OF HEALTH
THE GOVERNMENT OF THE REPUBLIC OF KENYA

The Study on Strengthening the District Health System in the Western Part of Kenya

Final Report

- Supporting Discussion 3 - Facility-based Health Service and Proposed Project



December 1998

Pacific Consultants International
IC Net Limited

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The exchange rates used in the Study are:
US$ 1.00 = 59.57 Kshs
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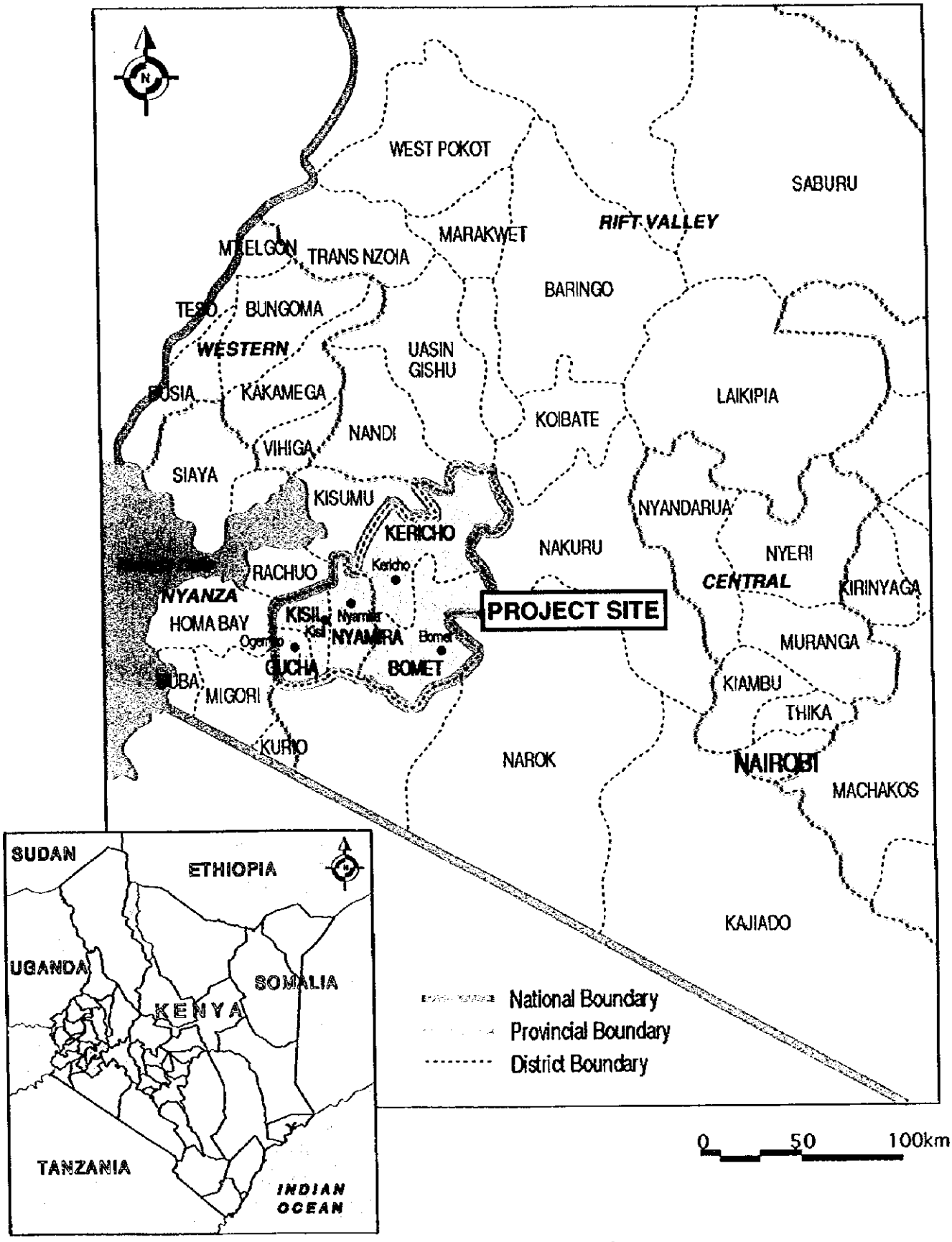
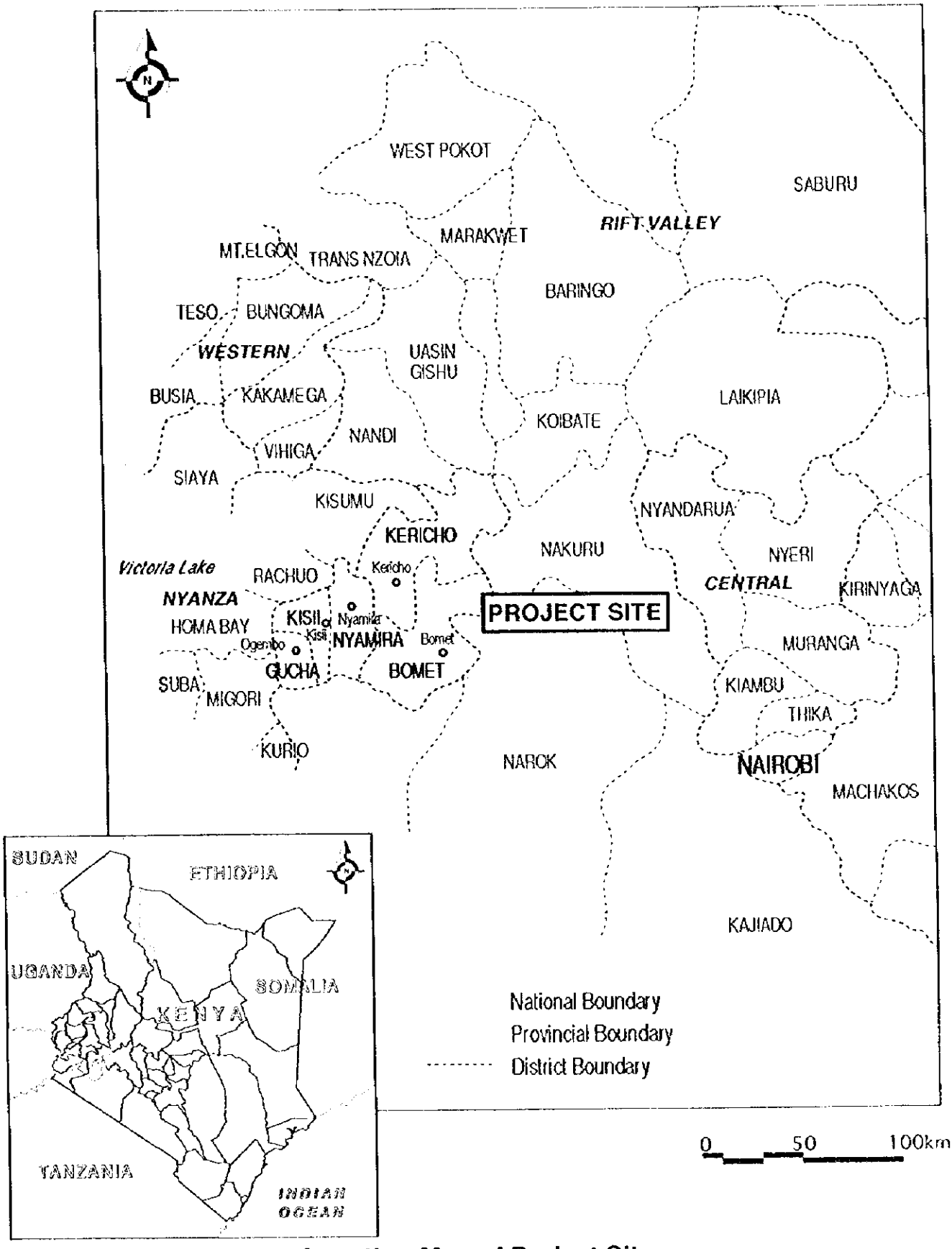
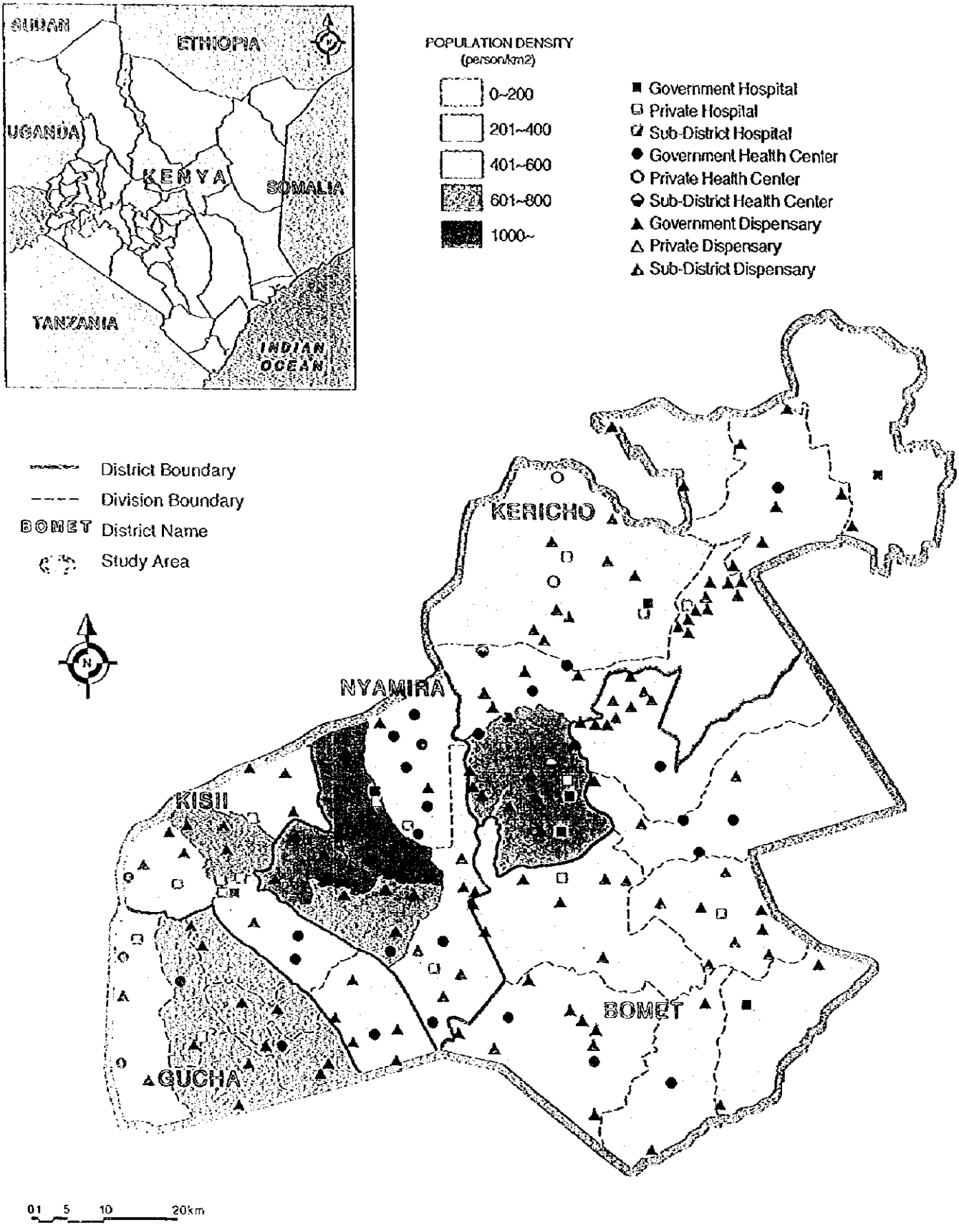
(as of the end of August 1998)

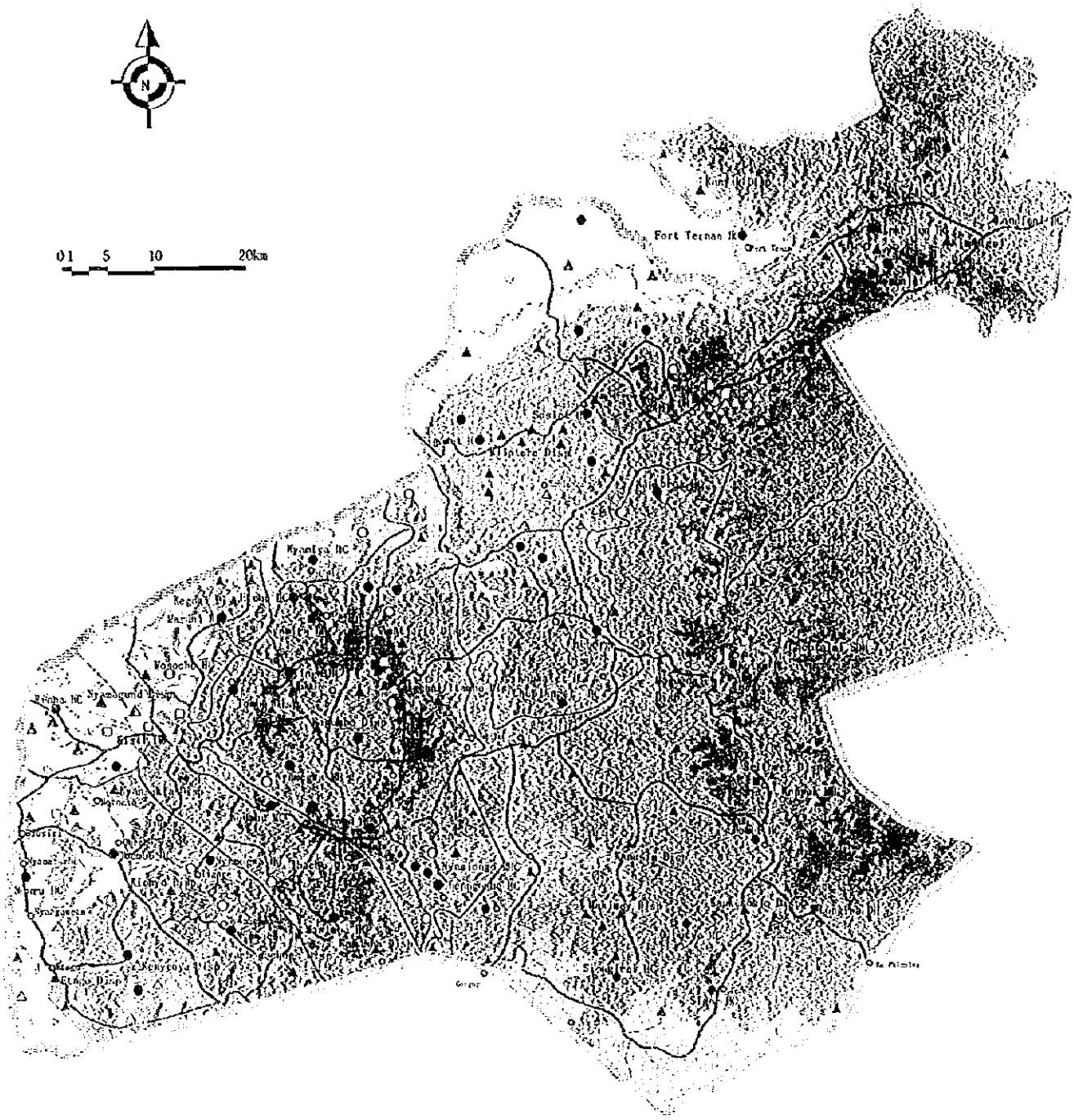


Location Map of Project Site



Location Map of Project Site


SUDAN
ETHIOPIA
UGANDA
KENYA
SOMALIA
TANZANIA
INDIAN OCEAN
POPULATION DENSITY
(person/km2)
0~200
201~400
401~600
601~800
1000~
Government Hospital
Private Hospital
Sub-District Hospital
Government Health Center
Private Health Center
Sub-District Health Center
Government Dispensary
Private Dispensary
Sub-District Dispensary
District Boundary
Division Boundary
BOMET District Name
Study Area
N
KERICHO
NYAMIRA
KISII
BOMET
GUCHA
0 1 5 10 20km



District Boundary

Division Boundary

contour

~5,000Ft (~1,520m)

5,000~5,500Ft (~1,680m)

5,500~6,000Ft (~1,820m)

6,000~6,500Ft (~1,980m)

6,500~7,000Ft (~2,140m)

7,000~8,000Ft (~2,440m)

8,000~

Government District Hospital

Private Hospital

Sub-District Hospital

Government Health Center

Private Health Center

Government Dispensary

Private Dispensary

Sub Dispensary

Distribution of Health Facilities in the Study Area

ABBREVIATION

AFD	African Development Bank
AIDS	Acquired Immunodeficiency Syndrome
AIE	Authority to Incur Expenditure
ALS	Average Length of Stay
ARI	Acute Respiratory Infection
BCG	Bacilli de Calmette-Guerin
BFA	Budget and Financial Analysis
CBD	Contraceptives
CBHC	Community-based Health Care
CBS	Consumers Baseline Survey
CDD	Control of Diarrhoea Disease
CIDA	Canadian International Development Agency
CO	Clinical Officer
CPM	Capital Project Management
CSM	Cerebrospinal Meningitis
DALY	Disability Adjusted Life Year
DANIDA	Denmark International Development Agency
DCEC	District Continuing Education Coordinator
DCO	District Clinical Officer
DDC	District Development Committee
DFID	Department for International Development
DH	District Hospital
DHEO	District Health Education Officer
DHIS	District Health Information Officer
DHMB	District Health Management Board
DHMT	District Health Management Team
DMOH	District Medical Office of Health
DMS	Director of Medical Service
DPHN	District Public Health Nurse
DPHO	District Public Health Officer
DPT	Diphteria-Pertussis-Tetanus Vaccine
DSP	Dispensary
DTB	Department Tender Board
ECN	Enrolled Community Nurse
EDF	European Development Fund
EDL	Essential Drug List
EDP	Essential Drug Program
EEC	European Economic Community
FIF	Facility Improvement Fund
FINNIDA	Association
FP	Family Planning
FY	Financial Year
GOK	Government of Kenya
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit
HC	Health Center
HCF	Health Care Financing
HECAFIP	Health Care Financing Program
HEROS	Health Sector Reform Secretariat
HESSP	Health Sector Support Program
HFC	Rural Health Facility Committee
HIMS	Health Information Management System
HMUs	Hospital Maintenance Unit
HPTC	Hospital Pharmacy Therapeutics Committee
IEC	Information, Education and Communication
JICA	Japan International Cooperation Agency
IPD	In-Patient Department
KAP	Knowledge, Attitude and Practice
KDHS	Kenya Demographic Health Survey
KEDL	Kenya Essential Drugs List
KEMRI	Kenya Medical Research Institute
KHCFP	Kenya Health Care Financing Program
KEPI	Kenya Expanded Program on Immunisation
KHPF	Kenyatta Health Policy Framework
KHRP	Kenya Health Rehabilitation Project
KMA	Kenya Medical Association
KMTC	Kenya Medical Training College
KNDP	Kenya National Drug Policy
KNH	Kenyatta National Hospital
MCH / FP	Maternal Child Health and Family Planning
MESD	Medical Engineering Service Division
MIS	Management Information System
MLG	Ministry of Local Government
MoPW	Ministry of Public Works
MSCU	Medical Supplies Co-ordinating Unit
MTB	Medical Tender Board
NASCAP	National AIDS/STDs Control Program
NGO	Non-governmental Organization
NHIF	National Hospital Insurance Fund
NPA	Non Project Assistance
NPHL	National Public Health Laboratory
OPD	Out-Patient Department
OPV	Oral Polio Vaccine
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Therapy
OTC	Over-the-counter Drug
PCM	Project Cycle Management
PHC	Primary Health Care
PHMT	Provincial Health Management Team
PHO(M)	Public Health Officer (Maintenance)
PHT(M)	Public Health Technician (Maintenance)
PIH	Pregnancy Induced Hypertension
PMU	Unit
PMOHs	Provincial Medical Office of Health
POM	Prescription-Only Medicine
PTA	Pharmacy and Therapeutics Committee
PTPP	Part Time Private Practice
PVC	Voluntary Organizations
RHTC	Rural Health Training Centre
RHF	Rural Health Facilities
RTI	Reproductive Tract Infections
SAD	Stores and Distribution
SDH	Sub District Hospital
SDP	Service Delivery Points
SIDA	Swedish International Development Agency
STD	Sexually-Transmitted Disease
TBA	Traditional Birth Attendant
TEC	Technical Evaluation Committee
TFR	Total Fertility Rate
TOT	Training of Trainers
TT	Tetanus Toxoid
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations Children Fund
USAID	U.S.Agency for International Development
VHC	Village Health Committee
WHO	World Health Organization
WB	World Bank

Table of Contents

Chapter 1

Introduction

1. INTRODUCTION

1.1 OBJECTIVES OF THE STUDY

The Objectives of the Study consist of the following:

(1) To establish a master plan to strengthen the district health system in the Study Area and to formulate an action programme for priority projects/programmes as a result of the master plan, and

(2) To conduct technical transfer to the Kenyan counter personnel in the course of the Study, in terms of methodologies on: 1) surveys and analyses for strengthening of the health sector; 2) people's participation in the planning process; and 3) a PCM approach to identification of planning issues.

1.2 THE STUDY AREA AND TARGET

The Study Area encompassed five (5) Districts, namely, Kericho, Bomet, Nyamira, Kisii and Gucha. The catchment areas served by Kericho District Hospital, including part of Nandi, Uasin Gishu and Kisumu Districts, are also included in the Study Area.

As of January 1998, Nyamira, Kisii and Gucha were officially named North Kisii, Central Kisii and South Kisii respectively. However, in order to keep the consistency among the series of the study reports, old names were adopted in this report.

The area has a population of 3 million in 8,031 square kilometres of land. The master plan covers the period up to the year 2005.

1.3 THE STUDY SCHEDULE

The Study took 14months from August 26, 1997 up to the end of December 1998 and was divided into two phases:

- The 1st Year Study : for the Base-line Study and Formulation of a Master Plan: up to March 1998
- The 2nd Year Study: for Formation of Action Plans and Projects/ programme from June to December 1998.

1.4 STUDY WORKFLOW

The Study was conducted in accordance with the workflow as shown in Fig. 1.1

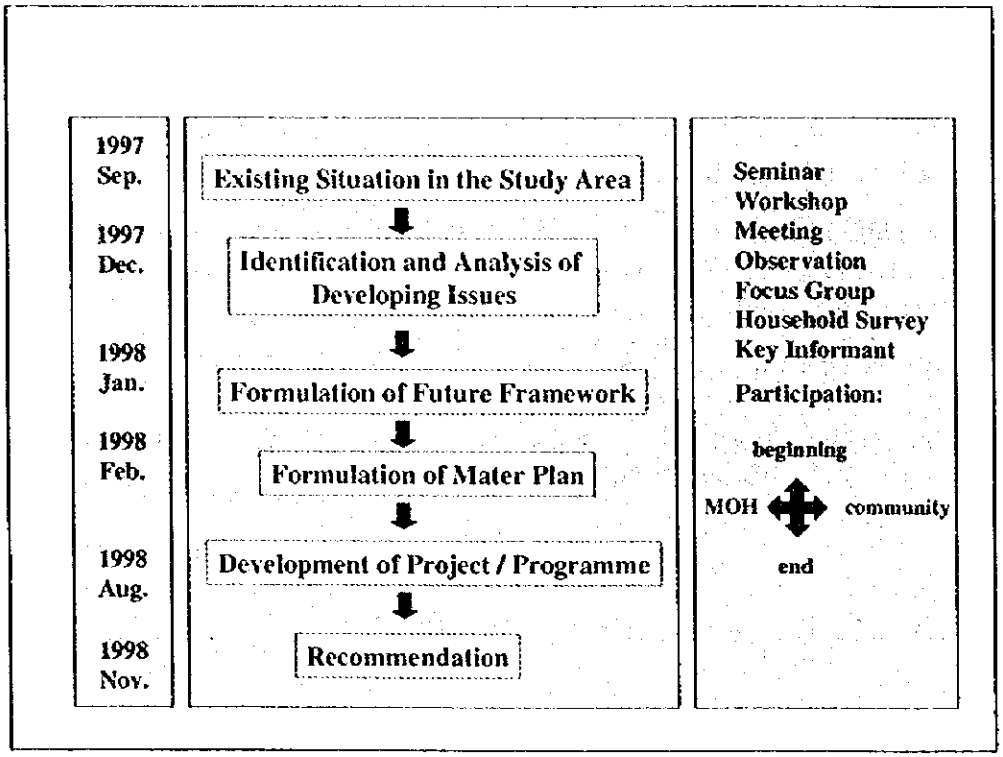


Fig. 1.1 Study Workflow

Throughout, a participatory approach was encouraged as much as possible from the beginning to the end of the Study as well as from all participants, and from the Central Ministry of Health to down the communities in the Study Area.

The Study also applied a wide variety of approaches including direct observation, key informant interviews, focus group discussion and household survey.

The products from these surveys and dialogues are used to formulate 10 strategies in the Master Plan aiming at the following 2 objectives.

> To provide all the residents with universal access to minimum promotive and preventive health care as well as curative health service and to upgrade the quality of the services.

To strengthen links with other sectors to facilitate community development relating to health improvement.

Following the strategies in the Master Plan, 5 project / programme packages were developed from 37 components of possible intervention with the criteria such as the consistency with National Health Sector Reform, cost effectiveness, and important base for the future development.

1.5 PROPOSED PROJECT / PROGRAMME

The figure 2.1 shows the Composition of 5 Proposed Project Package formulated through phase I Study. These are:

(1) Priority Disease Program;
(2) District Hospital Rehabilitation Program;
(3) Rural Health System Improvement Program;
(4) Community-based Promotive and Preventive Health Care Program; and
(5) District Health Service Education Program.

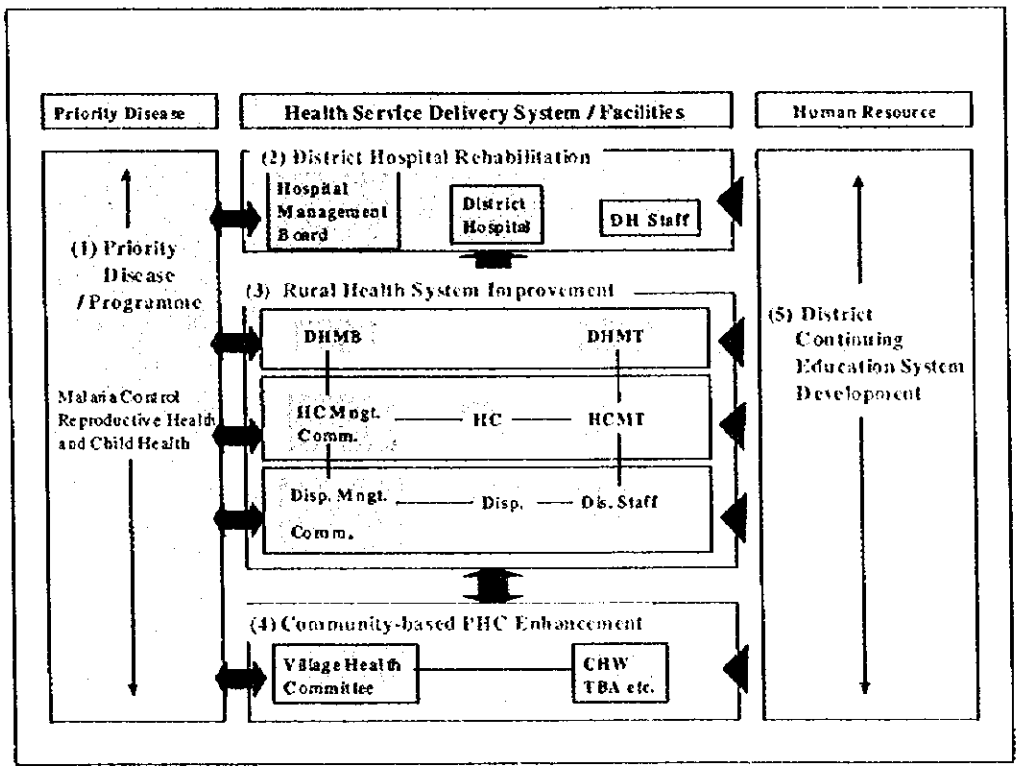


Fig. 1.2 Composition of Proposed Priority Project Package

1.6 SCOPE OF THE REPORT

The Study report consists of the following volumes.

(1) Summary Report

(2) Main Report

(3) District Health Delivery System (Supporting Discussion 1: Baseline)

(4) Priority Disease and Proposed Project (Supporting Discussion2)

- Malaria Control Project
- Reproductive and Child Heath Project

(5) Facility-based Health Service and Proposed Project (Supporting Discussion 3)

- Hospital Rehabilitation Program
- Rural Health System Improvement Program

(6) Community-based Development and Proposed Project (Supporting Discussion 4)

- Community-based Promotive and Preventive Health Care Program

(7) Human Resource and Proposed Project (Supporting Discussion 5)

- District Health Service Education Program

This volume is to report **Facility-based Health Service and Proposed Projects**. This report consists of four chapters. Chapter 2 is a general description of the facility-based health services in the study area, Chapter 3 focuses on the Hospital Rehabilitation Project, and Chapter 4 focuses on the Rural Health System Improvement project.

Chapter 2

Current State of Health Service in Districts

2. CURRENT STATE OF HEALTH SERVICE IN DISTRICTS

2.1 FACILITY-BASED HEALTH SERVICE

Facility-based health services are provided by licensed staff in authorised health facilities, such as District Hospitals (DH), Health Centres (H/C), and Dispensaries (DSP). The functions of these various facilities are described in the " *Definition and Categorisation of Health Facilities in Kenya*", which was drawn up by a technical committee with the support of the Ministry of Health in 1991 in order to provide uniformity of all health facilities in the country. Table 2-1 summarises the standard that should be available at dispensaries, health centres and district hospitals.

The dispensaries are staffed by 5-11 enrolled community nurses, subordinate staff, public health technician, and/or watchman. They are mandated to provide basic curative outpatient services, environmental health services, and other primary health care activities. Type 1 dispensaries are to serve a catchment population of up to 10,000 whereas Type 2 of up to 15,000. The three-roomed health facility and basic treatment facilities do not admit patients. Also, laboratory tests are not conducted in dispensaries.

On the other hand, health centres are expected to provide, on top of primary services, the following: nutrition, maternity, limited oral health, minor surgery, laboratory, and in-patient (12 hours maximum length of stay before the patient is referred). The 31-46 staff are responsible for managing consultation and treatment rooms, laboratory, minor surgery, pharmacy, sterilisation, delivery, kitchen, and laundry facilities. There would be about 18-24 beds available for maternity and other cases. Staff houses would be provided. The catchment population for Type 1 is from 50,000-70,000 while that for Type 2 is from 50,000-100,000.

The sub-district and district hospitals are designed to provide in-patient services on a longer term and to act as a referral centre for internal medicine, obstetrics/gynaecology, surgical services (limited capacity for sub-district and full services for district), dentistry, psychiatry, ophthalmology, otorhinolaryngology, and forensic medicine. They have operation theatre, intensive care, and radiographic facilities. They are capable of conducting more sophisticated laboratory examination such as blood chemistry, serology, screening for HIV & VDRL, sputum smear, blood typing and cross-matching. The 80-150 beds in a sub-district hospital are expected to serve a population of 100,000-250,000. The 150-300 beds in a district hospital cater to 250,000-1,000,000 residents.

Although not included in Table 2-1, provincial hospitals were established and operated by the government to provide the entire spectrum of primary, secondary, tertiary, and

specialised health services. They accept referrals from district hospitals, particularly for diagnostic and therapeutic care that require highly qualified specialists in various disciplines. They have from 250 to 800 beds to cater to a catchment population of 1 to 2 million.

The Kenyatta National Hospital is a national referral and teaching hospital providing mainly tertiary and specialised services. It is also the centre for clinical research. There are other specialised hospitals in the country such as the Spinal Injuries Hospital, Mental Health Hospitals, Infectious Diseases Hospitals (inclusive of Tuberculosis and Leprosy Hospitals), and Maternity Hospitals. The physical facilities, staffing norm, and number of beds vary according to the specialisation of the hospital.

Table 2-1 Definition and Categorization of Health Facilities in Kenya

	Dispensary		Health Centre	
	Type 1	Type 2	Type 1	Type 2
Service Provided	Basic Curative OPD Basic Environmental Health	Basic curative OPD Environmental Health, MCH/FP, Immunization services	Basic curative OPD Environmental Health, MCH/FP, Immunization services Nutrition Maternity services Limited Oral Health Services (Mobile Services) Minor Surgery IPD on observation basis (12 hours maximum length of stay before referral)	Curative OPD, Environmental Health, MCH/FP(Integrated), Immunization Services, Nutrition, Maternity Oral Health Services Minor Surgery IPD on observation basis (12 hours Maximum Length of stay before referral) CBR(Community Based Rehabilitation) includes Physio/Occupational therapy.
Physical Facilities	3 rooms for basic treatment.	4-6 Rooms with a waiting area (for basic treatment, MCH/ FP services) Staff houses	Consultation and treatment rooms and equipment. Small laboratory Minor surgery facilities Staff houses.	Consultation and treatment rooms & equipment. Small laboratory Minor surgery. Mortuary Pharmacy Sterilization Delivery Kitchen and Laundry Staff Houses
Catchment Population	Up to 10,000	Up to 15,000	Up to 50,000 - 70,000	50,000 - 100,000
Number of Beds	No beds	No beds (2-4 observation beds)	8 Maternity beds 4 Observation beds	13-24 beds

Training Health Centers Rural Health Training Centers Rural Health Demonstration Centers	Hospital			
	Sub-District Hospital	District Hospital	Provincial Hospital	National Hospital
Curative OPD Environmental Health MCH/FP(Integrated) Immunization Services, Nutrition, Maternity Services Physical Medicine Oral Health Services Minor Surgery IPD on observation basis CBR Inservices training for health workers	Provides mostly primary and secondary care Limited specialized care Internal medicine General Surgery (Limited) Dental services including dental laboratory services Obstetrics/Gynaecology Paediatrics	Primary, secondary and limited tertiary care as well as training. Service as the first referral level hospital for the SDH: Internal Medicine Obstetrics/Gynecology Full Surgical Services Dental Services Psychiatry Ophthalmology Ear, Nose, Throat (ENT) Forensic medicine	Secondary and tertiary care. Specialized (consultancy) services in various discriplines. Accepts referrals from district hospitals and must have a well established referral system. Training center for all health staff.	a. Spinal Injuries Hospital b. Mental Health Hospitals c. Infections Diseases hospital which includes the Tb/Leprosy Hospitals d. Maternity Hospitals
Consultation and treatment rooms and equipment. Small laboratory Minor surgery facilities. Mortuary Pharmacy Sterilization Delivery Kitchen & Dining Hall Laundry Central Stores Students hostels Lecture rooms Administration Block and Staff Houses.	A modest OPD, IPD: Diagnostic and Treatment Department, Central Supplies Dept. Adm. Block. for OP/IP primary and secondary care. Amenities, Consultation Clinics, Casualty, Admission and Medical Records. Pharmacy, Laboratory, X-Ray, Operating Theater, Intensive Care Sterilization, Delivery, Administration Physiotherapy/Occupational Therapy Kitchen, Laundry, Central Stores, Boiler room & generator house Maintenance Workshop, Mortuary, Incinerator Staff Changing room and Staff Houses.	Fairly large OPD, IPD, Diagnostic and treatment departments, Central Supplies Dept. Adm. Block for OP/IP primary, secondary and limited tertiary care. Amenities, Consultation Clinics, Casualty, Admission and Medical Records. Pharmacy, Laboratory, X-Ray, Operating Theater, Intensive Care Sterilization, Delivery, Administration Physiotherapy/Occupational Therapy Kitchen, Laundry, Central Stores, Boiler & generator house Maintenance Workshop, Mortuary, Incinerator Staff Changing room, Staff houses	Large and fairly sophisticated OPD, Diagnostic and Treatment Dept., IPD, Central Supplies Dept. and Adm. Blocks, for OP/IP secondary and tertiary care. Amenities, Consultation Clinics, Casualty, Admission and Medical Records. Pharmacy, Laboratory, X-Ray, Operating Theater, Intensive Care Sterilization, Delivery, Administration Physiotherapy/Occupational Therapy, Burns Unit, Psychiatric Unit, Orthopaedics; E.N.T. Kitchen, Laundry, Central Stores, Boiler & Generator house, Maintenance Workshop, Mortuary, Incinerator Staff Changing room Staff Houses.	This will vary according to the specialization of the hospital.
50,000 to 100,000	100,000 - 250,000	250,000 - 1,000,000	1,000,000 - 2,000,000	National, Regional
13 - 24 beds	80 - 150 beds	150 - 300 beds	250 - 800 beds	Varies

2.2 DISTRIBUTION AND COVERAGE OF HEALTH SERVICES

2.2.1 Distribution of Health Facilities

As shown in Table 2-2 and the figure of geographical distribution of health facilities at the beginning of this report, there are more than 300 health facilities serving a population of 2.7 million people.

While the number of RHF per person (Health Centre and Dispensary) in the study area seems to meet the national standard, their distribution pattern is not equitable, in particular, in Bomet and Gucha. This inequitable distribution might have occurred due to the absence of a master plan for facility distribution and a lack of guidance to communities. The communities' demands are usually high for new facilities and upgrading of the existing facilities. However, many of the existing facilities are not as functional as expected.

District Medical Officers strongly think that **Hospitals** should be located at least one in every district, with one of them designated as a "Government District Hospital", other than MOH standard. However the District Hospital in Bomet is only functioning at Health Centre level, and there is no District Hospital in the new Gucha district. As a result, there are only three fully functioning District Hospitals in this Study Area. Six MOH hospitals are located in the Study Area. Seven private hospitals are located in Kericho, four in Bomet, four in Nyamira, five in Kisii and three in Gucha. These include private hospitals run by NGO's /Missions. The number of hospitals per 100,000 people is almost 1.1 in the Study Area as a whole.

The service catchment areas of Kericho and Kisii District Hospital are shown in Fig.3-1, 2, and 3. It is clear that Kisii DH covers not only Kisii District, but also a part of Nyamira, Gucha, Transmara and the other surrounding Districts. The reason for this is due to the lack of an appropriate functional hospital in these districts, the lack of specialists and other factors.

As against this, in Kericho, there are two other hospitals and the ratio of Health Facilities to population is highest in the study area. As a result of this condition, the service catchment area of Kericho DH is limited to some divisions of Kericho District.

Health Centres (H/Cs): Considering the number of HC's in terms of population per facility, the highest rate of 83,399 is in Bomet, while the lowest rates of 62,352 and 65,326 are in Nyamira and Gucha respectively. The average of the Study Area is 69,112 person per H/C. This rate satisfies the standard described in the "*Definition and Categorisation of Health Facilities in Kenya*", which is 50,000 – 100,000 persons per facility.

Dispensaries: According to the "Definition and Categorisation of Health Facilities in Kenya", one dispensary should be planned for each community with a population of 10,000 - 15,000 persons. Excluding private dispensaries, the highest rate of 39,196 is in Nyamira, while the lowest rate in 12,197 in Kericho. The average is 20,266 persons per DSP, and it exceeds the MOH standard.

Table 2-2 Distribution of Health Facilities by Service Levels

		KERICHO	BOMET	NYAMIRA	KISII	GUCHA	TOTAL
Area	Km^2	2,524	2,611	879	645	657	6,231
Population	1997	597,698	583,799	587,942	489,481	436,464	2,695,384
No. of H/H*1	1996	98,769	106,855	67,557	94,640	68,261	436,082
Avg. H/H size	1996	6.5	6.4	7.2	6.4	6.4	6.5
Pop. Density	Prs/Km^2	237	224	669	759	664	433
Population	2005	771,021	770,195	733,222	606,702	540,988	3,422,128
Pop. Density	Prs/Km^2(2005)	305	295	834	941	823	549
No. of Health Facilities							
Hospital	GOK	3	1	1	1	0	6
	NGO/Mission	1	2	0	2	1	6
	Private	5	2	0	0	0	7
	Others	1		4	3	2	10
	Sub-total	**10**	**5**	**5**	**6**	**3**	**29**
Health Centre	GOK	9	7	9	7	7	39
	NGO/Mission	2	1	7	1	4	15
	Private	0	0	0	1	1	2
	Others	7	0	9	0	0	16
	Sub-total	**18**	**8**	**25**	**9**	**12**	**72**
Dispensary	GOK	49	37	15	19	13	133
	NGO/Mission	5	3	7	5	4	24
	Private	42	0	6	5	2	55
	Others	2	0	12	0	0	14
	Sub-total	**98**	**40**	**40**	**29**	**19**	**226**
Total	GOK	61	45	25	27	20	178
	NGO/Mission	8	6	14	8	9	45
	Private	47	2	6	6	3	64
	Others	10	0	25	3	2	40
	Total	**126**	**53**	**70**	**44**	**34**	**327**
Health Facility by Service Level Per 100 thousand People							
	Hospital	1.7	0.9	0.9	1.2	0.7	1.1
	H/C	3.0	1.4	4.3	1.8	2.7	2.7
	Dispensary	16.4	6.9	6.8	5.9	4.4	8.4
(Dispensary Except priv. & N/M ones)		8.5	6.3	4.6	3.9	3.0	5.5
Population Per Health Facilities							
	Hospital(GOK)	199,232.7	583,799.0	587,942.0	489,481.0	-	449,230.7
	H/C(GOK)	66,410.9	83,399.9	65,326.9	69,925.9	62,352.0	69,112.4
	Dispensary(GOK)	12,197.9	15,778.4	39,196.1	25,762.2	33,574.2	20,266.0
	Total(GOK)	9,798.3	12,973.3	23,517.7	18,128.9	21,823.2	15,142.6
Inaccessible Areas							
	No. of Places	3	3	3	2	5	16
	Area (km2)	158	120	78	29	77	462
	Population	26,755	25,032	23,935	20,980	60,424	157,126
	% of TL Pop.	4.1%	3.7%	4.9%	3.5%	13.9%	5.5%
	% of Area	6.3%	7.8%	9.1%	4.5%	11.7%	7.4%

Source: MOH and JICA Study Team / KEIPET Field Survey
*1 : H/H = House Hold

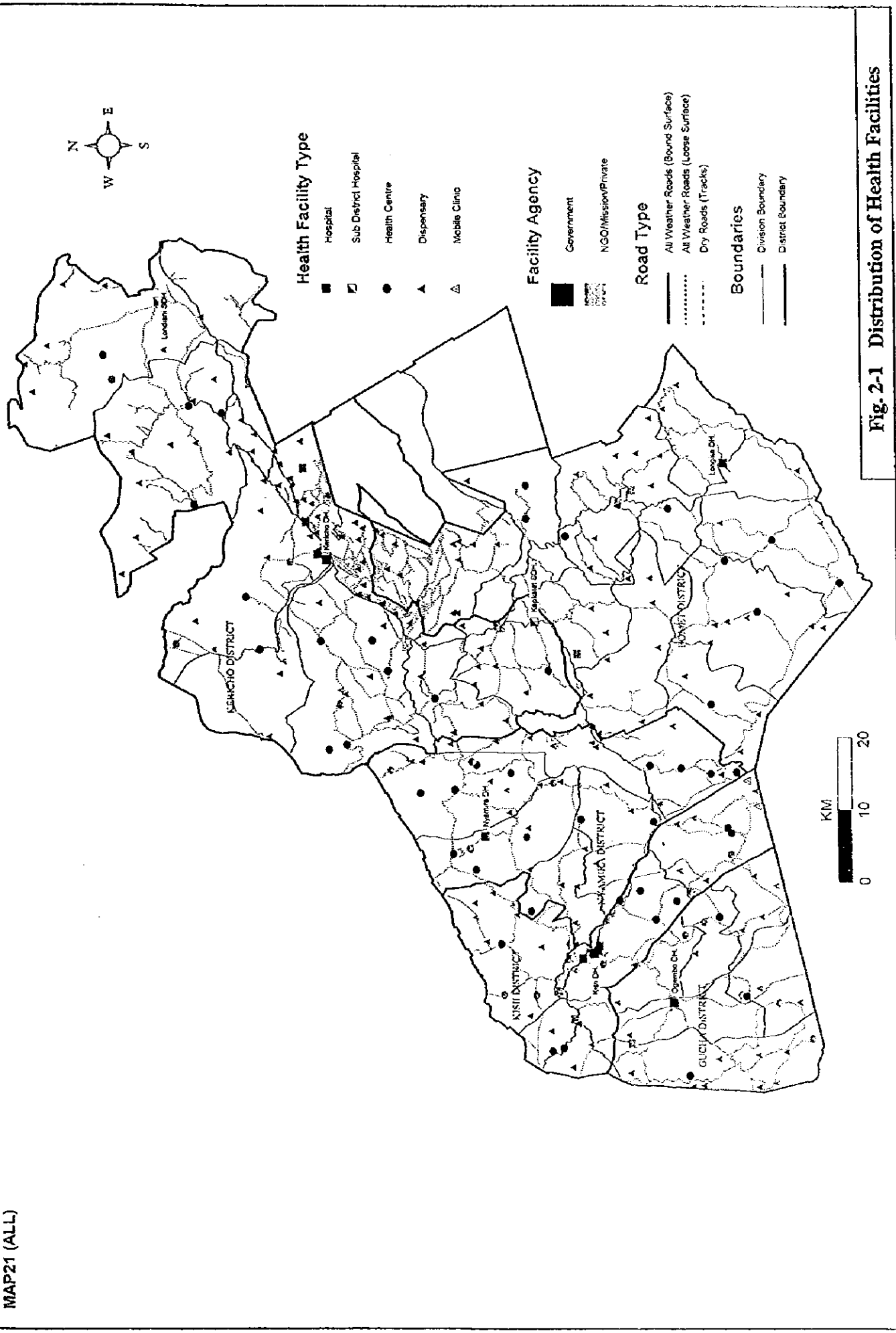


Fig. 2-1 Distribution of Health Facilities

MAP21 (ALL)

Based on this standard, the Study Area should have 190 - 280 Dispensaries. At present there are 220, including the private dispensaries. In accordance with the requirements, the quantity of dispensaries meets the need, but the distribution pattern is unbalanced.

Regarding the quantity of RHFs, to meet the minimum target, about 60 more dispensaries should be built by 2005. This would include those needed to fulfil the current shortage and those to serve the increased population of 720,000 (projected by the Team) up to 2005.

It is noted that there is still inaccessible area as shown in Table 2-2, which account for 5.5% of total population or 7.4% of total area (Refer to the next setion).

2.2.2 Available Service and Coverage

Study Team determined the following as important factors which influence availability and coverage of services provided in health facilities.

(1) Number of attendants to each type of health facilities as an integrated indicator of service quality (analysis of service quality is shown in 2.3);
(2) Geographical distribution using assumed coverage range (GIS analysis) as shown in Fig. 2-2;
(3) Number of population in inaccessible areas;
(4) Preference of transportation means to health facilities; and
(5) Road network and condition.

For factor (1), the Study Team estimated the number of out-patients of each type of facility based on existing statistics. For (2), various kinds of geographic information are incorporated in map of target area. (3) and (4) were studied mainly through interview and launding questionnaires to key informants and out-patients of health facilities. (5) is based on existing references in each district.

(1) The number of attendant to health facilities:

The number of attendant to health facilities is estimated based on data of the number of out-patients recorded by HIS, and rate reported per year for each district. The ratio of total number of patients at H/Cs and Dispensaries in a year to population is about 0.8, which is an average of almost one visit to a rural health facility per person per year.

Table 2-3 The number of out-patients

		Kericho	Bomet	Nyamira	Kisii	Gucha	Total
DH	No. of case	N.A.	915	41,432	63,753	N.A.	
	Reporting Rate	N.A.	75%	83%	83%	N.A.	
	Estimated NoC	N.A.	1,220	49,718	76,504		127,442
H/C, DSP	No. of case	N.A.	253,288	57,505	188,838	157,825	
	Reporting Rate	22.2%	48.4%	7.5%	37.7%	43.6%	
	Estimated NoC	N.A.	523,300	766,733	500,897	361,984	2,152,913
DH+H/C, DSP			524,520	816,452	577,400	361,984	2,280,355
Average Visit per Year		N.A.	0.9%	1.4%	1.2%	0.8%	

Source: JICA Study Team, October 1998

(2) Analysis based on the Geographical Distribution

As mentioned above, while the number of RHF (Health Centre and Dispensary) per population in the study area seems to meet the national standard, their distribution pattern is not equitable, in particular, in Bomet and Gucha. Fig.2-1 shows the distribution of H/Cs and DSPs. It is clear that the distribution, especially for H/C, is not even.

This inequitable distribution might have occurred due to an absence of a master plan for facility distribution and a lack of guidance to communities. As usual the communities' demands are high for constructing and upgrading facilities. However, many of those facilities are not functioning as expected compared to the category of facility in which they fall.

It has been assumed that each health facility covers an area within a 5km radius, based on the walking distance. It covers around 18 thousand people in Kericho and Bomet, and more than 50 thousand people in Nyamira, Kisii, and Gucha. As shown in the Fig. 2-2, most of the study area is covered by existing facilities, although there are some exceptions.

(3) Analysis based on the Inaccessible areas surveyed

The Study Team defined inaccessible area as the place with the following limitations.

- shortage or lack of road;
- very poor condition of road;
- no transportation means to approach health services;
- presence of topographic barriers (e.g. steep hill);
- threat to security; and
- high cost (more than 2 hours of trip by public transportation) to approach health services;

Inaccessible areas were identified through interviewing key informants in rural health facilities. Study Team and DHMT selected 16 inaccessible areas as seen in Table 2-4. The population in these inaccessible areas is estimated to be more than 5.5% (or about 150,000) of the total population. The locations of the following inaccessible area are shown in the Appendix 1.

Table 2-4: List of Inaccessible Areas by Physical and Social Barriers

District	Area	Lack of Road	Poor Road	Lack of Transport	Topographic Barriers	Insecurity	High Transport Cost	% of Total Pop.	% of Land Area	
Kericho	Kapsorok		x	x	x		x	4.1	6.3	Ke1
	Kapseger		x	x			x			Ke2
	Kebenet		x	x			x			Ke3
Bomet	Lilaitich		x	x	x	x	x	3.7	7.8	B1
	Chebunyo		x	x	x	x	x			B2
	Kapkolei		x	x						B3
Kisii	Sensi		x	x	x		x	3.5	4.5	Ki1
	Metembe		x	x	x	x	x			Ki2
Nyamira	Biticha		x	x	x			4.9	9.1	N1
	Mokomoni		x	x	x		x			N2
	Isoge/Kineni		x		x	x	x			N3
Gucha	Boochi		x	x	x		x	13.9	11.7	G1
	Kiango	x		x	x	x				G2
	Nyangusu	x		x	x	x	x			G3
	Turwa		x	x	x		x			G4
	Bosoti		x	x	x	x	x			G5
Grand Total								5.5	7.4	

Source: JICA Study Team. Interview with Road Officers for 39 Health Facilities, including four District Hospitals, 1997.

(4) Transportation Means

As shown in the following table, walking is the most common mode of transportation to health facilities[Ref. Table 2-5]. The use of motor vehicles is very limited and other modes of transport include the use of bicycles, wheelbarrows, home-made stretchers and, rarely, animals.

Table 2-5: Percentage Distribution of Mode of Transportation for Health Facilities

Mode of Transportation		% of Patients				
		Kericho	Bomet	Kisii	Nyamira	Gucha
District Hospital	Walking	80.0	50.0	35.0	85.0	-
	Public Transport	5.0	5.0	35.0	10.0	-
	Others *1	15.0	45.0	30.0	5.0	-
Health Centres	Walking	60-95	66-90	70-80	85-95	60
	Public Transport	0-20	3-30	10-20	0-10	20-30
	Others *1	5-20	4-15	2-5	5-10	10-20
Dispensaries	Walking	80-94	60-80	70-80	60-98	70-80
	Public Transport	0-10	8-25	10-20	0-30	5-15
	Others *1	5-7	0-15	0-5	0-8	15
Missionary Health Centre	Walking	70.0	5.0	50.0	40.0	40.0
	Public Transport	15.0	90.0	30.0	20.0	40.0
	Others *1	15.0	5.0	20.0	40.0	20.0
District Total	Walking	70.0	65.0	70.0	85.0	70.0
	Public Transport	7.4	18.0	20.0	10.0	20.0
	Others *1	0	0	5.0	0	5.0
Others		22.6	17.0	5.0	5.0	5.0

Source: JICA Study Team. Survey of Patients in the OPD of District Hospitals, 3 Public Health Centres, 3 Public Dispensaries and 1 Missionary Hospital/HC in Each District, 1997.Others *1(private cars, bicycles, stretchers, wheelbarrow, animal carts)

However, some preferred facilities, such as hospitals and missionary hospital or health centres, have many outpatients coming in by public transport and hired private cars. It

may be worthy to note that many people preferred to visit a facility of good quality (e.g. Tenwek Mission Hospital) even if they have to spend many on public transport charge.

The settlement pattern in rural areas contributes to difficulties in access. In the five districts studied, some homes are widely dispersed. Other people would settle in areas where road construction is difficult such as in valley bottoms or on hilltops. The rain makes transfer of sick people from these remote settlements even more arduous. It is understandable, therefore, for some to opt to walk or carry their patients using hand-made stretchers.

Patients transportation means, distance and times to H/Cs were assessed based on the results of interview with patients at 16 Health Centres. The summary of the profile of interviewees is shown in Table 2-6 and geographical distribution of the interviewed patients' addresses, with the radius of the average distance to their residence is shown in Fig.4-3 Service Catchment Area of P-H/C.

Table 2-6 Patients travel mode, distance and times to P-H/Cs

		Female	Male	Total
Total no. of sample		192	97	289
No. of patients who used Matatu	(Person)	37	23	33
Percentage of patients who used Matatu	Proportion	19.27%	23.71%	20.76%
Ave. Travel Distance (Km)	Matatu	3.93	4.10	3.99
	On foot	3.42	3.24	3.37
Ave. of travel time (Hours)	Matatu	1.06	0.97	1.00
	On foot	1.28	1.35	1.33

Source: JICA study team, June - July 1998

The result of the interviews showed that the proportion of patients who used Matatu to H/Cs is around 20% on average. The travel distance of patients to H/Cs is around 3.4km and travel time to H/Cs is around 1.3 hours on average.

(5) Road Network and Condition

Table 2-7 shows a comparison of the road network in the Study Area. It can be concluded that there is less than 1 kilometre of road per square kilometre of land area. Though Nyamira has the best road coverage among the five districts with 0.7 km per square kilometre, the condition of roads is poor. Many roads frequently become impassable, particularly during the wet season. Maps of road network and distribution of Helath Faicilities are shown in Appendix-1.

Table2-7 Road Classification and Conditions

District	Total Road Length (km) by Road Class*							Condition		Area (km^2)	Total Road:
	A	B	C	D	E	Other	Total	Wet Season	Dry Season		Area Ratio
Nyamira	0	18.0	88.7	161.3	137.4	209.2	614.6	Bad	Bad	879.0	0.7:1
Kericho	0	97.0	49.2	59.9	205.1	N/A	227.7	Bad	Bad	2,515.0	0.3:1
Bomet	0	62.0	130.6	216.2	327.3	304.2	1,040.3	Bad	Bad	1,835.0	0.3:1

**Road Class*: A: international trunk road; B: national trunk road; C: primary; D: secondary; E: Minor; Others: rural access road, tea road, etc.
Source: Ministry of Public Works and Housing.

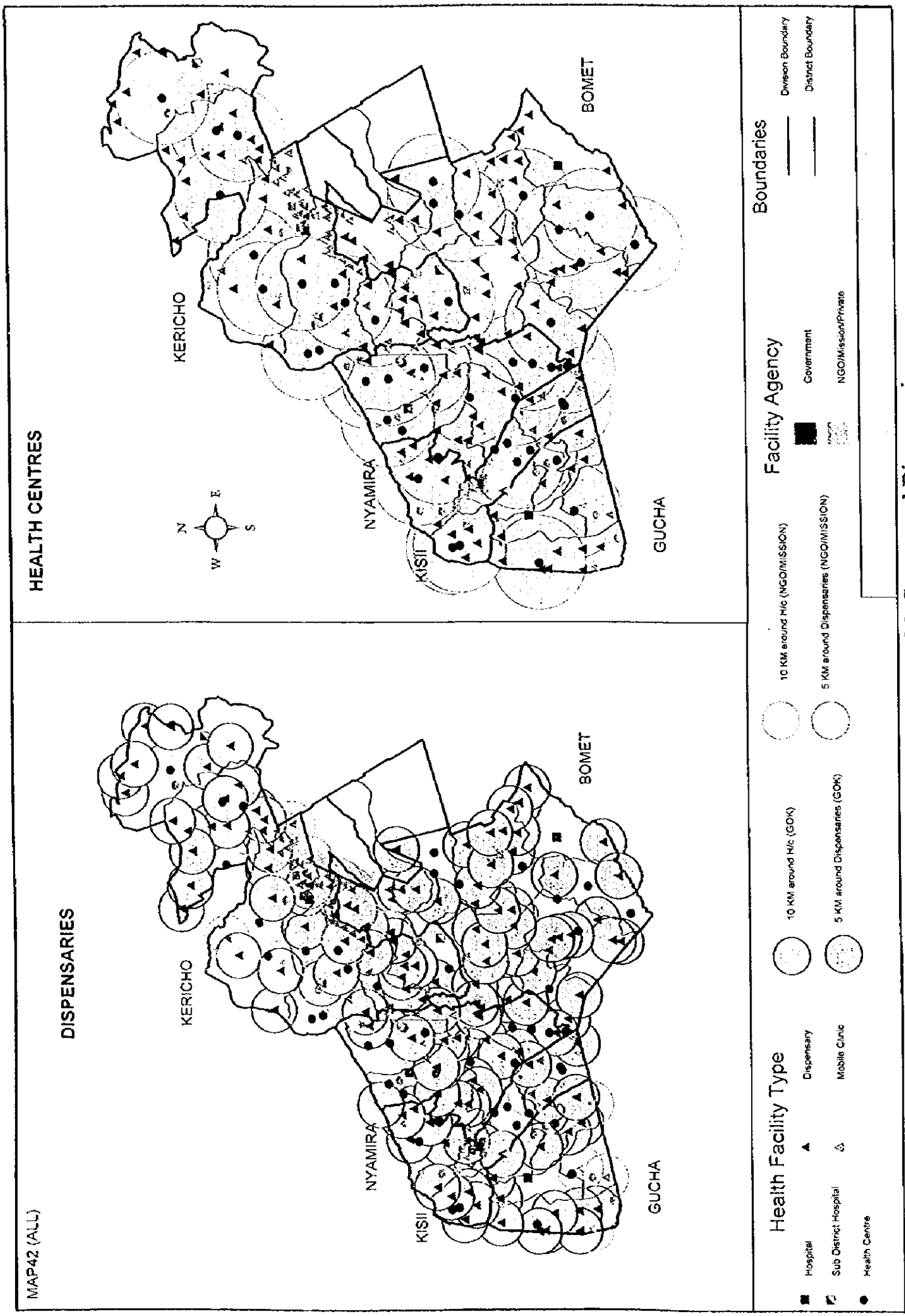


Fig.2-2 Distribution of Health Cenres and Dispensaries

2.3 AVAILABLE FACILITY-BASED HEALTH SERVICE

The overall description of the rural health services at dispensary level and health centre level is shown below.

On the matter of health service in H/C and DSP, the study team conducted two kinds of survey. One was a questionnaire survey to check their activities, and 125 samples were collected in total. The other was a detailed survey by interview, for 38 facilities out of 311 rural health facilities.

2.3.1 Dispensary Level

The dispensaries offer basic outpatient curative services for common diseases and minor surgical problems, and also offer environmental health, according to the standard. The quality of health services at the dispensary level depends highly on personality of the health staff. In some dispensaries, it was often observed that no qualified staff was on duty during working time.

A shortage of staff is chronic at the dispensary level. The MOH can staff them with only one nurse or none. One nurse cannot cover all of the required health services, including health education and promotion, without any support. There were some cases in which, even though a community built its own dispensary with funds raised through "Harambee", MOH could not staff it at all, so alternatively unqualified staff would be assigned to the post, often resulting in poor services.

As a result of the questionnaire survey, only 45 out of 84 DSPs answered that they have MCH service, and only 38 out of 84 DSPs answered that they have immunisation service.

Table2-7 Service provided in Dispensaries

	No. of Sample	MCH service		Immunisation		Environmental Health	
Kericho	32	21	65.6%	10	31.3%	20	62.5%
Bomet	26	6	23.1%	10	38.5%	22	84.6%
Kisii	16	10	62.5%	12	75.0%	14	87.5%
Gucha	10	8	80.0%	6	60.0%	7	70.0%
Total	84	45	53.6%	38	45.2%	63	75.0%

Source: JICA study team

More details are given in Table 2-8 on curative services for common diseases and some preventive services provided at 7 dispensaries surveyed.

Most dispensaries stock chloroquine as the first-line medicine for malaria under the MSCU policy. As chloroquine-resistant malaria seems to have spread, this may be one cause of the significant increase of malaria in-patients and mortality during the past two years. At the same time about half the dispensaries have anti-malaria drugs including quinine and

other oral tablets. On the other hand chloroquine injection is overused because of the preference by the patients. Recently the guidelines for diagnosis, treatment and prevention of malaria have changed. Distribution of the guidelines and education for health personnel will occur soon.

It is difficult and may be impossible to make definite diagnosis of malaria and to distinguish other febrile diseases from malaria at dispensary level where no microscopic examination is available. More discussion is needed about whether dispensaries should be provided with microscopy, which enables more accurate diagnosis of malaria, in terms of finance, human resources, and maintenance. However, the quality of service in this aspect can be improved by introduction of proper guidelines for diagnosis of malaria and other diseases such as ARI and pneumonia without microscopy, and also by observation of the severity of patients' status so that proper referral can be arranged. In reality, only half of the dispensaries use the guidelines for diagnosis of ARI. This can lead to misdiagnosis of upper respiratory tract infection (URI) and pneumonia, and also misuse of antibiotics.

Table 2-8 Health Services at Dispensaries (N=7)

Health services at Dispensary	A	B	C	D	E	F	G
Anti-malaria, chloroquine	O	O	O	O	O	O	O
quinine			O	O			O
other drugs						O	O
Guideline of diagnosis of ARI	O	O				O	O
Laboratory work			O(a)			O(b)	O(c)
Minor surgery	O		O	O	O	O	O
ORS	O	O	O	O	O	O	O
Nutrition : Iron Supplement	O	O		O	O	O	O
MCH : Growth Monitoring		O				O	O
Immunisation	O	O				O	O
Antenatal Care	O	O	O			O	O
Family Planning	O	O				O	O

Source: JICA Study Team 1997
(a) Urine analysis
(b) Haemoglobin, haematocrit, urine analysis
(c) Malaria blood smear, stool analysis, Haemoglobin, haematocrit, urine analysis, AFB

According to our survey of details of health services, all dispensaries (7 dispensaries) provided instruction on use of ORS, which contributed to lower the case-mortality rate of diarrhoea. Other basic health services in which dispensaries can play an important role are preventive health, such as antenatal care, family planning, growth monitoring and immunisation. Antenatal care was available at 5 dispensaries out of 7, family planning and immunisation at 4 dispensaries, and growth monitoring at 3 dispensaries. It is suspected that possibly 30 to 60 % of all dispensaries do not provide those basic preventive health services.

Although iron supplement was available at most dispensaries (6 out of 7), the number of adults or children covered by this service was not found. Growth monitoring usually does not include measurement of height, probably because of lack of an instrument, and assessment of development was done only at one dispensary. Immunisation may not be effective where chain cold is a problem, especially at peripheral level. Antenatal care was available at 5 dispensaries. The care includes measurement of weight, blood pressure,

foetal heart rate. Urine analysis is available at 3 dispensaries. Family planning services include provision of condoms, oral contraceptive pills (OCP), and injection of Depo Provera. Only one dispensary provided intrauterine device (IUD).

The range of health services provided at dispensaries varies from one to another. In Table 2-8, the dispensary F and G are seen to provide most basic services including simple laboratory work, whereas dispensary D and E cannot provide preventive services such as immunisation, antenatal care and family planning.

2.3.2 Health Centre Level

Health centres should be able to offer curative, preventive and promotive services. They should have in-patient services for normal deliveries and acutely-ill patients who need in-patient care for a certain period. According to the *Definition and Categorisation of Health Facilities in Kenya*, health centres are supposed to observe the patients less than 12 hours.

The health centre is theoretically and institutionally required to function as the primary referral health facility linked with both the dispensary at lower level and the district hospital at the higher level, as well as providing more extensive primary health care to local people. Yet, most health centres in the Study Area generally had the same problems as those of dispensaries, such as shortage of staff, poor quality of health services, weak outreach activities, misuse and leakage of drugs and chain cold problems, and so on. Because of these constraints, generally the health centres are functioning worse than could be expected.

The deficiency of basic functions of the health centre is concomitant with poor health infrastructure. It was often observed that a health centre in the Study Area did not have enough water supplies to provide health services for delivery, laboratory, and sterilisation, as well as cooking and cleaning, which greatly limited its functioning.

A result of the questionnaire survey is shown in the following table. 41 answers were collected out of 72 H/Cs. In comparison with dispensaries, the ratios of H/C, which offer MCH and Immunisation service, are higher. However, only 22 out of 41 H/Cs offer Delivery service and only19 H/Cs offer IPD services.

Table 2-9 Service provided in Health Centres

	No. of smpls	MCH		Imm.		Maternity Service				IPD		EH		Dental	
						Ante-natal		Delivery							
		Pers	%	Pers	%	Pers	%	Pers	%	Pers	%	Pers	%	Pers	%
Kericho	17	17	100.	17	100	15	88.2	7	41.2	2	11.8	14	82.4	0	0
Bomet	9	8	88.9	8	88.9	8	88.9	7	77.8	6	66.7	7	77.8	2	22.2
Kisii	8	7	87.5	7	87.5	7	87.5	7	87.5	4	50.0	5	62.5	0	0
Gucha	7	7	100	7	100	0	0	1	14.3	7	100	4	57.1	6	85.7
Total	41	39	95.1	39	95.1	30	73.2	22	53.7	19	46.3	30	73.2	8	19.5

Source: JICA Study Team

Health centres should provide adequate curative services for common diseases that do not require in-patient care or require only observation for a short period, with simple laboratory examinations such as microscopic examination, haemoglobin, haematocrit, and urine and stool analysis.

The results of the detail survey in 12 H/Cs are shown in the Table2-10. The reality is that microscopic examination for malaria was available at only 7 out of 12 health centres visited. In-patient care was available at 6 health centres, intravenous fluid therapy at 4 health centres, measurement of haemoglobin and haematocrit at 4 health centres. More than half of the health centres cannot perform their expected role in curative medicine.

Delivery service was available at 9 health centres out of 12; other preventive services such as immunisation, growth monitoring, family planning, etc. were available at most health centres studied with details varying from facility to facility. The immunisation programme has problems with the chain cold, and coverage rates are difficult to determine. Growth monitoring was available at all health centres visited, but measurement of height was available only at 3 facilities. A growth-monitoring programme loses many children after 1 year old or older, when they no longer need to come to health facilities for immunisation. That is the period when children are most vulnerable to malnutrition due to weaning. Family planning includes provision of condom, oral contraceptive pills and injectable Depo Provera at 9 facilities, and IUDs at 6, but none of them can perform tubal ligation.

Looking at Table 8.3, the range of health services that a health centre can provide differs greatly from one to another. Health centres A, D, G and I can provide basic curative services including in-patient care, intravenous fluid therapy, and some laboratory work. Health centres A and L do not provide family planning methods for religious reasons. Health centre L may offer counselling such as the rhythm method. Health centres B, E, F, H and K have very limited services available, without microscopic examination, in-patient care, or intravenous fluid therapy.

Strengthening the role of health centres in terms of delivery service, basic curative services for common diseases with simple laboratory work, and short-term care, can upgrade the quality of services as well as maximise the usage of health centres by patients. Also this strengthening of H/C's function would reduce the congestion of the district hospitals and improve the referral system. Health centres should also be strengthened to provide preventive and promotive health services that would improve baseline health status.

Table 2-10 Health Services at Health Centres (N=12)

Health services at Health centre	A	B	C	D	E	F	G	H	I	J	K	L
Anti-malaria chloroquine	O	O	O	O	O	O	O	O	O	O	O	O
Quinine	O		O	O				O	O	O		O
Others	O	O	O	O	O			O	O	O		O
Guideline of diagnosis of ARI	O		O		O	O	O			O		O
Antibiotics: Oral type	O	O	O	O	O	O	O	O	O	O	O	O
Injection		O	O	O	O	O	O	O	O	O	O	O
In-patient care	O			O			O		O	O		O
Intravenous fluid therapy	O			O			O		O			
ORS	O	O	O	O	O	O	O	O	O	O	O	O
Labo. service: Malaria blood smear	O		O	O			O		O	O		O
Stool analysis	O		O	O	O		O		O			O
Urine analysis	O		O	O								O
Haemoglobin/ haematocrit	O		O	O								O
Iron supplement	O	O	O	O	O	O	O	O	O	O	O	O
Growth monitoring- weight	O	O	O	O	O	O	O	O	O	O	O	O
height	O		O						O			
development	O		O	O	O	O	O		O	O	O	O
Immunisation	O	O	O	O	O	O	O	O	O	O	O	O
Antenatal care	O	O	O	O	O	O	O	O	O	O	O	O
Delivery	O	O	O	O	O		O		O	O		O
Family planning		O	O	O	O	O	O	O	O	O	O	O
Condom		O	O	O	O	O	O	O	O	O	O	
OCPs			O	O	O	O	O	O	O	O	O	
Injectable Depo provera			O	O	O	O	O	O	O	O	O	
IUDs					O	O	O	O	O	O		
Tubal ligation												

Source: JICA Study Team 1997

2.3.3 District Hospital Level

The review of 6 hospitals in the Study Area clearly showed that the hospitals have the services to manage complicated cases of malaria, ARI, diarrhoea, and pregnancy [Ref. Table 2-11].

They are the primary health facilities in keeping control of emerging and re-emerging diseases. They have the diagnostic tests for HIV. They are designated as the focal facility for diagnosis and treatment of tuberculosis, too, although Nyamira did seem to have some problems at the time of the survey.

The hospitals have varying capacities to handle both major and minor surgeries. Support systems, such as blood banking, are also in place.

However, a few essential health services and goods in the survey checklist are not available, specifically:

- SP is not yet the drug of choice for all cases of malaria;
- Guidelines for the diagnosis of ARI are not being applied in all the district hospitals;
- Oral dehydration salt is not available in the district hospitals in Kisii and Nyamira;
- Monitoring of children's height is not performed in all facilities, except in Tenwek, while developmental assessment is not done in Kisii only;

However, a few essential health services and goods in the survey checklist are not available, specifically:

- SP is not yet the drug of choice for all cases of malaria;
- Guidelines for the diagnosis of ARI are not being applied in all the district hospitals;
- Oral dehydration salt is not available in the district hospitals in Kisii and Nyamira;
- Monitoring of children's height is not performed in all facilities, except in Tenwek, while developmental assessment is not done in Kisii only;
- Vasectomy is not performed in Nyamira, Kaplong and Central; and
- Basic examination of urine and blood (haemoglobin/haematocrit) is not available in Nyamira.

It is apparent that Nyamira District Hospital needs improvement in many areas.

Although it is not in the standard health package, pregnancy test is not available in any public health facility. It is performed at Kaplong and Tenwek Mission Hospital only.

Table 2-11 Health Services and Goods Actually Available at Hospitals (N=6)

Health Services and Goods	Kericho DH	Kisii DH	Nyamira DH	Kaplong MH	Tenwek MH	Central H (Kericho)
Anti-malaria (chloroquine, quinine, and others)	O	O	O	O	O	O
Care for complicated malaria	O	O	O	O	O	O
Malaria blood smear	O	O	O	O	O	O
Guideline of diagnosis of ARI		?		O	O	
antibiotics (oral, injectable)	O	O	O	O	O	O
X ray	O	O	O	O	O	O
Immunisation	O	O	O	O	O	O
ORS	O	?		O	O	O
Intravenous fluid therapy	O	O	O	O	O	O
Stool analysis	O	O	O	O	O	O
Growth monitoring, weight	O	O	O	O	O	O
height		?			O	
development	O	?	O	O	O	O
Antenatal care	O	O	O	O	O	O
Normal delivery	O	O	O	O	O	
Dilatation & curettage	O	O	O	O	O	O
Caesarean section	O	O	O	O	O	
Family planning (condom, OCP, Depo-provera, IUD, tubal ligation)	O	O	O		O*	O
vasectomy	O	O			O	
HIV Screening	O	O	O	O	O	O
Sputum smear for AFB	O	O		O	O	O
Sputum culture		?		O		
STS screening	O	O	O	O	O	O
TB treatment	O	O	O	O	O	O
Urine analysis	O	O	?	O	O	O
Haemoglobin/haematocrit	O	O		O	O	O
Blood transfusion	O	O	O	O	O	O
Minor & major surgery	O	O	O	O	O	O
Education on diet	O	?		O	O	O

Source: JICA Study Team 1997
* does not include IUD

2.4 HEALTH FACILITIES

2.4.1 Definition and Categorisation of Rural Health Facilities

As mentioned above, Health Facilities in Kenya have been defined and categorised in the "*Definition and Categorisation of Health Facilities in Kenya*", which was drawn up by the Ministry of Health in 1991 in order to provide uniformity for all health facilities in the country. This document defines the functions, staff, buildings required in health facilities at each level [Ref. Appendix-1].

The requirements of the above mentioned document are not being met. Even in simple matters, such as the title of facilities, there are discrepancies. For example the document categorises Dispensaries as "Type 1" and "Type 2", whereas "Dispensary" and "Sub-Dispensary" are commonly used names. The level of service, staff, facilities and equipment of most of the RHF's in the study area fails to meet the requirements.

The standard "*Health Centre August 1973*", a World Bank Scheme published by the Ministry of Works in August 1973 in order to achieve uniform facilities in all types of rural health buildings is also relevant. In this standard, some individual small standard units are designed, and which can be assembled in a variety of forms to create a health centre. In this system, each type of health facility unit can grow to be larger one, when need arises [Ref. Appendix-2]. In this scheme, the title of Sub-Health Centre is used.

In addition, Ministry of Public Works has some standard plans for Health Centres and Dispensaries. In the same way as WB Scheme, the facility unit can be expanded and accompanied by the grading up. However, due to lack of guidance, the number of facilities which meet with these standards is very small [see to Appendix- 4].

Table 2-12 Required Facility Components of PHC

Dept.	Components	MOH				MOH(WB scheme)			PW			
		DSP		HC		DSP	SHC	HC				
		Type 1	Type 2	Type 1	Type 2				Type 4	Type 3	Type 2	Type 1
OPD /MCH	Consultation Rm.	3	4-6						2	2	5 rms	5 rms
	Treatment/Injection Rm.										2 rms	2 rms
	Laboratory			(6)							1 rm	1 rm
	Minor Surgery Rm.										1 rm	1 rm
	Pharmacy										1 rm	1 rm
	MCH											
	FP											
	Delivery Rm. inc. sterilisation Rm.											
	Maternity ward			8 beds								6 beds
	Kitchen / Laundry											
IPD	Female ward			6-	12-							2 beds
	Male ward			12 beds	24 beds					2 beds		2 beds
	Paediatric Ward											2 beds
	Isolation Ward											
Staff house						4	8	12				

Source: JICA Study Team
Note; [ ] : Explicit requirement [ ] : Implicit requirement

Table 2-12 above, shows the comparison of facility components among the MOH standard described in the "*Definition and Categorisation of Health Facilities in Kenya*", and typical plan for the facilities prepared by MoPW.

Only the MOH standard includes some description about the services required. Though there some obscure points, Standards of MOH and MoPW are generally similar from one to another except for the capacity of ward.

The management of these facilities of MOH is under control of Ministry of Public Works and Housing. MoPW has a standard drawing for the health facilities. Based on the request from MOH, MoPW prepare the drawing, B/Q and Tender documents.

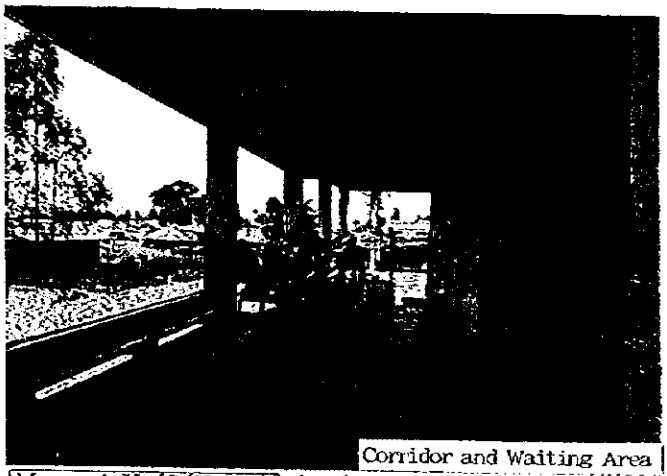
There is a "*Building Code*" published in 1987, which was first compiled in 1968 based on a British Standard. However, there are some points, which are not relevant in the present conditions, because of their origins in the British Standard. Revision of the code by MoPW has been carried out, and discussion of these revisions is presently underway.

2.4.2 Existing condition of Health facilities

Some RHFs are constructed based on the MOH's standard or world bank scheme, and some are according to the PW's and the WB's typical plan, according to the construction body and construction year. The facility of RHFs in the Study Area can be categorised into four following types. [Ref. Fig.2-7]

- The standard type of the MoPW: Health Centres consists of several single story buildings that are connected by roofed walkway. Between the main OPD building and MCH/FP, there is a waiting area and an inner corridor.
- Middle corridor type : This is also one of the MoPW's typical style. The main building which has a corridor in the middle, depends on roof lighting . The waiting area is well lighted and ventilated.
- World Bank scheme type: Most of the dispensaries including these reconstructed or expanded by PMIU are of this type. Basically, the main building is consists of 3-4 rooms that have been extended over a period of time.
- Communities' original type: This is the original style that has been modified in several ways. Most of the RHFs and FHFs were built in this style, but later they have been modified.

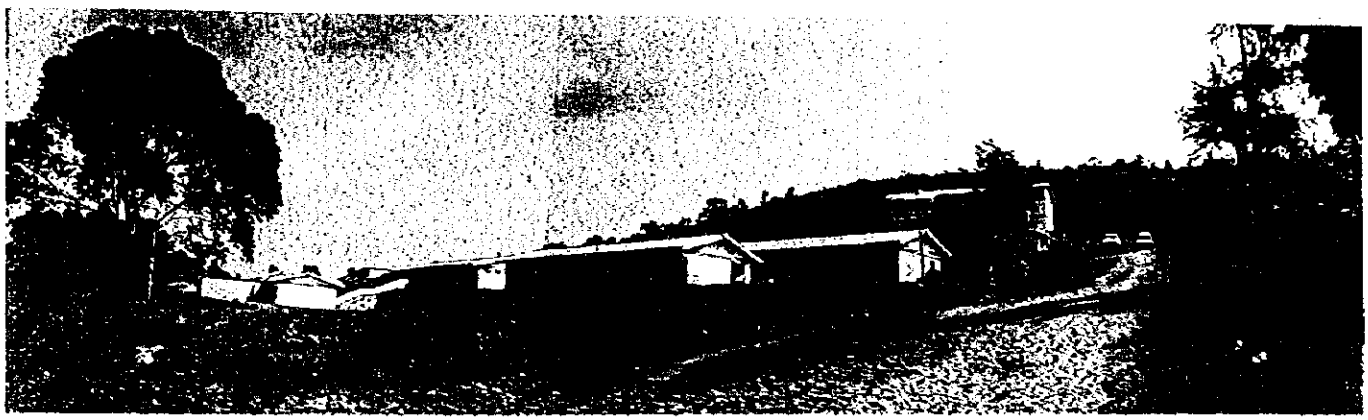
Though there are definitions and guidelines, the specific details of the facilities are not described. Most of the RHFs have been built by the community without guidance and any instructions. They are constructed of concrete columns supporting timber truss, the materials for wall are mainly stones, bricks or concrete blocks, and roofing is GI corrugated sheet or asbestos sheet.

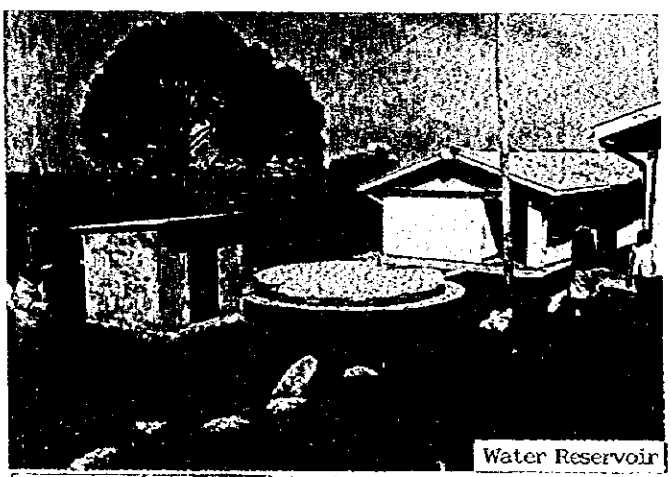


Corridor and Waiting Area

Delivery Room

Marani H/C(Kisii) (PW's Standard Type - 1)



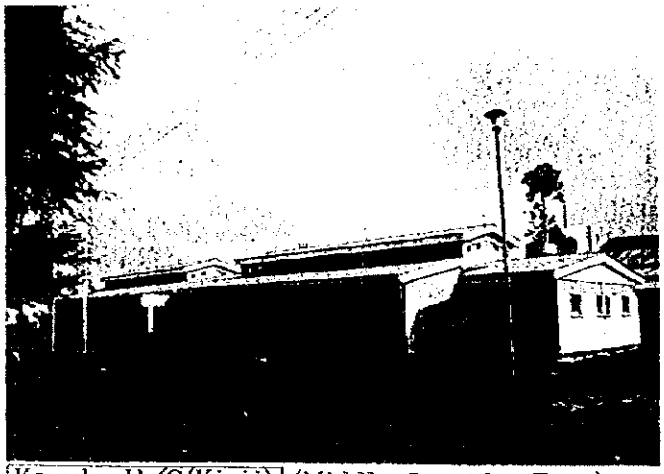


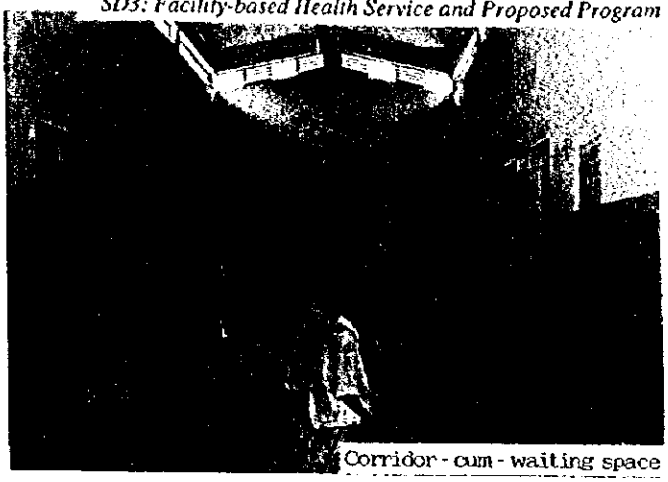
Water Reservoir

Corridor and Waiting

Sigor H/C(Bomet) (PW's Standard Type - 2)

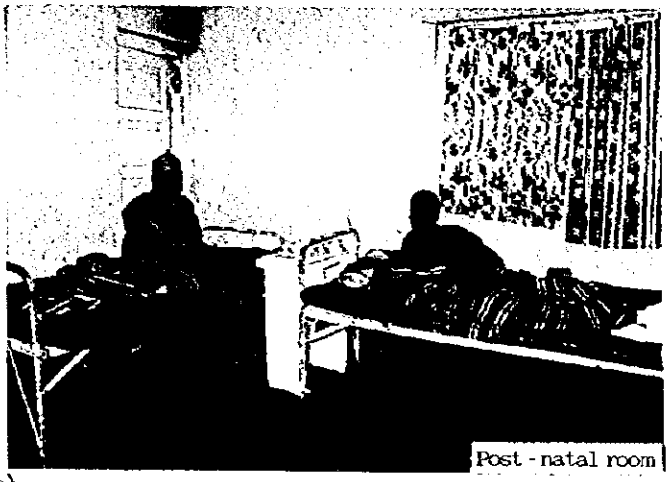
Fig.2-7 Health Centres/Dispensaries - 1





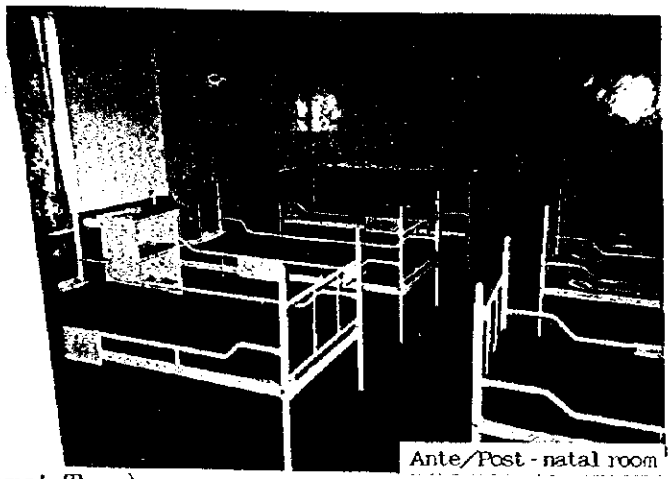
Corridor - cum - waiting space

Keumbu H/C(Kisii) (Middle Corridor Type)



Post - natal room

Sosiot H/C(Kericho) (World Banck Scheme Type)



Ante/Post - natal room

Kapkoros H/C(Bomet) (World Banck Scheme, Bomet Type)

Main Old building

New Building

Ibeno H/C(Kisii) (Community's Original Type)

Major findings and problems through the survey are summarised as follows:

1. Many RHFs have difficulty in providing standard services because of lack of facilities. Specifically, there are many H/C s with the DSP level facility, and only 18 out of 31 health centres that were visited could assist mothers in delivering their babies because they do not have a maternity ward and the basic equipment [Ref. Table 2-13].

2. There are some facilities losing their potentiality as facility or equipment, due to problems such as lack of water supply or incomplete construction work etc. For example, Koiwa HC in Bomet has good facilities and equipment sufficient for SDH, however its function is limited to Dispensary Level because of water problem. Though Masimba HC in Kisii has a water treatment system with elevated tank, they are not able to get piped water because the system has been broken and is difficult to repair.

3. With regard to the infrastructure, the minimum and/or optimal standards for facilities such as water systems and staff houses for the RHF's are not stipulated. Many RHF's lack a water supply system. This is one of the biggest problems which hampers their function. The provision of rainwater collection system using roof gutters and tanks is being considered to improve services in RHFs.

4. Regarding the physical condition of RHF, many dispensaries (except those renovated under the PMIU project) and health centres have much room for improvement, because of the lack of maintenance and fund.[Ref. Appendix-7,8, and 9] The common problems are as follows;

   - Broken windows
   - Broken door and window locks
   - Rain water leakage through the roof
   - Mold and damage of ceiling board
   - Leakage of water tank
   - Cracks to floor and walls

   In order to improve RHFs, establishment of a preventive maintenance system including improvement of budgetary system as well as both long and short-term renovation plans for each district is required.

5. There are some facilities of which construction works were left incomplete. Under the existing system, the condition of each facility and its activities are dependent on the will and commitment of local community. Therefore, communities are aspected to get some advice about construction, if the community applies and ask some advice from PMIU office or PHO prior to construction. However, some communities are unaware of this system and start to build it by their own.

   To solve this problem, it is recommended that total control and management of the construction work of buildings and infrastructures, including the financial matters, and operation of the RHF's needs to be transferred to District Level.

Table 2-13 Current Condition of Health Cenres

Name of Facility	OPD *1	EH *2	MCH *3	Labo *3	Obs. *4	IPD *5	Facility *6	Equip. *6	Remarks
<KERICHO>									
Sosiot HC	80p/d (200)	1PHO 3PHT	○		4 beds 20 dlv/m	(4beds)	○	◎	Ward in MCH Bldg. is not usec. 4beds located in a main bldg. is for both maternity and IPD use.
Momoniat HC	15p/d (50)	1PHT	○				△	△	Only OPD Bldg. Maternity ward will be constructed by community in future.
Kipkerion HC	20p/d (100)	1PHO 3PHT	○				△	○	Water pressure of piped water is too low because of that location. Only OPD Bldg.
Chaplanget HC	30-50p/d (100)	1PHT	○				△	△	Piped water is coming, but water pressure is not enough. Only OPD Bldg.
Sigowet HC	40 p/d (200)	1PHT	○	○	6beds	18beds	◎	◎	6 beds are in the isolation ward. IPD Bldg. and Staff House are under construction.
Lemotit HC	20 p/day		○				△	△	
Fort Ternan HC	50 p/d (120)	2PHT	○		-		△	○	1 Main building.
<BOMET>									
Olbutyo HC	80-100p/d	1PHT	○				△	△	The land for Maternity ward has been obtained by the Community.
Bomet HC	30p/d	1PHO 1PHT	○	○			△	△	In the process of preparing construction Maternity Ward.
Koiwa HC	30 p/d	1PHT	○		(6beds)	(24 beds)	◎	◎	This was built as a SDH, however no IPD service because of lack of water.
Cheptalal S DH	30p/d	1PHT	○		6beds 20 dlv./m	(9 beds)	◎	○	This was built in 1985 with a support by WHO, but has not been full operationed yet. Operation theatre has not been used because of lack of equipment.
Kapkoros HC	50-100 p/day	1PHT	○	○	6beds		○	△	OPD. 29,000p/y Maternity's BOR:50%
Sigor HC	42p/d (150)		○	○	6beds	(24 beds)	◎	○	Rural training HC. No. IPD service because of lack of water.
Ndanai HC	30-40p/d	1PHO 2PHT	○	○	5beds	5beds	○	△	1 Main Building and 5 staff houses.
Siongoroi HC	62 p/day		○	○	6beds	6beds	○	○	Capacity is not enough except for IPD. No service function.

Source : Field Survey by JICA Study Team (November,1997)

* 1 :OPD : Average No. of OP per day.(Malaria season) [ ] : 50 prs/d and over, [ ] : Less than 50 prs/d.
* 2 :EH(Environmental Health) : No. of PHO(Public Health Officer), PHT(Public Health Technician), Field Educator.
* 3 :MCH and Labo. : ○ means the HC provides MCH and Labo. service as a ordinary work.
* 4 :Obs : [ ] : HC which povides Delivery service ordinary. The No. shows the beds' number in Maternity Ward.

Name of Facility	OPD*1	EH*2	MCH*3	Labo*3	Obs. *4	IPD *5	Facility*6	Equip.*6	Remarks
<NYAMIRA>									
Chepngombe HC	25 p/d		○				△	△	OPD Building only.
Nyamaiya HC	15 p/d (40-50)	2PHT	○				△	△	Maternity Ward, a half of the building has not been completed yet.
Tinga HC	50p/d (200)	1PHT	○		(Emer. Case only)	4beds	○	○	Delivery service is only for the emergency case because of lack of equipment.
Etono HC	31 p/d (100)	1PHT 1Fld Ed.	○				△	△	Under construction of Maternity building by community. Inconvenient to access.
Manga HC	25p/d	1PHO 4 PHT	○		6beds	6beds	◎	○	1 old bldg. and 3 bldgs. However, Kitchen bldg. has not been used. Microscope was stallen.
Ekerenyo HC	30p/d	1 PHO 1 PHT	○	○	(6beds/ Emer. only)		○	△	Mail bldg. and Kitchen bldg Maternity ward and Kitchen were not used.
Keroka HC	40 p/d	2PHT	○	○	6beds 2 p/d		○	△	Under construction of Maternity Ward and Kitchen.
<KISII>									
Masimba HC	48 p/d	1PHO 2PHT	○	○	8 beds (2-3 dlv/w)	8 beds BOR 55%	◎	◎	Elevated tank and water purification tank is out of order.
Keumbo HC	150 p/d		○	○	4 beds (2-3 dlv/w)	8 beds BOR 28%1	◎	◎	Under renovation and remodelling of old staff house to Kitchen and Laundry. Meals are supplied from nearby hotels.
Ibeno HC	50-100 p/d	1PHO	○		(IPD)	20 beds BOR 25%	△	△	OPD and IPD buildings built ten years ago has not been used because of lack of drainage system.
Marani HC	50 p/d	PHO	○	○	2beds	16beds BOR 75%	◎	○	Design capacity : OPD 50p/d IPD 24beds
Riana HC	50 p/d	1PHT	○		3beds	6beds BOR 30%	◎	△	Design capacity : OPD 50p/d IPD 16beds
<GUCHA>									
Ogembo HC	70 p/d	2PHO 2PHT	○	○	10del/w 4beds	7beds 300p/m	◎	◎	This is required to be up-graded to DH
Nduru HC	24 -50 p/d	1PHT	○	○		20beds BOR 60%	◎	◎	Design Capacity : OPD 50p/d
Kenyenya	40p/d	1PHT	○		5beds		○	△	1 OPD bldg and 1Maternity bldg. PMIS renovated this HC last year.
Nyamache HC	45 p/d (200)	1PHT	○		2beds		○	◎	Design Capacity : OPD 50p/d

* 5 :IPD : No. of beds for in-patients. [ ] :more than 3 beds, [ ] :1-3 beds.
* 6 :Facility/Equipment : ○:It has required facility and equipment to function as a HC(Type1)
◎:It has required facility and equipment to function as a)HC(Type2)
△:It does not have enough facility and equipment to function as HC.

2.4.3 Equipment at Health Centres and Dispensaries

Generally, medical equipment in all the facilities is not in a satisfactory condition. There is much room for improvement. At most of the health facilities surveyed by the Study Team, even essential equipment necessary to provide minimum functions/services was observed to have been damaged, poorly maintained, and much of it was out of order.

The Preventive Maintenance Implementation Unit (PMIU), strongly supported by donors such as DANIDA and UNICEF, has provided a total of 110 medical equipment kits for RHF's in Kericho, Bomet and Kisii. The benefits, which would have been expected from these contributions, are likely to be lessened due to inadequate maintenance.

PMIU supported by DANIDA and UNICEF is providing medical equipment kits to 110 facilities in Kericho, Bomet and Kisii districts. It is also distributing tool kits to facilities in Nyamira. Moreover, PMIU occasionally dispatches PHTs (Public Health Technicians) to these facilities to carry out maintenance of facilities and medical equipment.

Since the medical equipment used by these facilities is simple and robust, it is generally kept in a fairly good condition. Nevertheless, it was observed that in many cases essential equipment such as sphygmomanometers and stethoscopes has been damaged and remains in that condition.

Chapter 3

Hospital Rehabilitation Program

3. HOSPITAL REHABILITATION PROGRAM

3.1 BACKGROUND OF THE PROJECT: CURRENT STATE OF DISTRICT HOSPITALS

3.1.1 General Information

It is assumed that deterioration of facilities and equipment hinders improving the quality of curative service provided at the district hospitals. In fact, there has been no major rehabilitation over the years due to chronic financing problem while demand on the hospital service exceeds capacity of the hospitals, particularly in Kericho and Kisii. For example, the bed occupancy rate of Kisii becomes more then 200% on average, and in malaria season it reaches 550%.

Based on the MOH standards, at least one district hospital should be located in every district. However, there is no district hospital in Gucha and the one in Bomet has just begun to provided in-patient services. At present, there are three functioning DH in the Study Area. Considering other hospitals that are operating, the number of hospitals per 100,000 people is almost 1.1.

On the other hand, the organisation of the hospitals split among the DHMTs, DHMBs, and Hospital Management Boards (HMBs) which is now in consideration to be fully responsible for the running of the district hospitals, are neither clear-cut nor effectively shared among these important organisational bodies.

In addition, the hospitals do not have an internal organisational structure. Their performance, including quality, has never been assessed. In fact, the management system is not in place, particularly, the accounting system, which must be improved in order to increase the collection of cost-sharing revenue.

Despite their role and service in catchment area, the hospitals are under-funded (the financing gap was estimated at 41% of the expected financing) and this results in a worsening of the service quality together with deterioration of building, equipment and infrastructure. Lack of proper planning for facilities and building and poor maintenance exacerbated the problem.

Unavailability and deterioration of medical equipment hampers the diagnostic capability of the DH. In addition, the capacity of attached Hospital Maintenance Unit is very limited in terms of its technical capability and financing.

In fact, disease treated at hospitals can be generally taken care at lower facilities. Table 3.1 shows the number of patients who suffer from the ten most common diseases in Kisii DH and Kericho DH. Though the years of records are different these data reflect the trend in the previous years in each area.

However, there is on the ratio between the in-patients and out-patients morbidity, it may be concluded that there is a better preventive / promotive effort in Kisii than in Kericho, because the number of out-patients requiring inpatient care is lower than in Kericho. It may also be assumed that the people in Kericho would delay before bringing their patients to the hospital.

Table 3-1 Number of patients of 10 most common diseases

A. Kericho DH (1997)

	Out-patients Morbidity		In-patients Morbidity	
1	Malaria	10,059	Malaria	9,532
2	Respiratory DX	9,433	Respiratory DX	6,371
3	Skin Diseases	3,527	Anaemia	3,273
4	Gastro-enteritis	3,028	Gastro-enteritis	1,752
5	intestinal Worms	2,340	Dehydration	971
6	Ear Infections	1,038	Typhoid	905
7	Dental Disorders	973	Pneumonia	890
8	Eye Infections	732	Eye Infections	735
9	RTA	450	RTA	573
10	Typhoid	352	PTB	375
	Total	31,932	Total	25,377

B. Kisii DH (1996)

	Out-patients Morbidity		In-patients Morbidity	
1	Malaria	34,419	Malaria	10,933
2	Respiratory Tract Infections	11,250	Anaemia	2,765
3	Skin Diseases	4,140	Gastro-enteritis	723
4	Accidents	3,905	Pneumonia	705
5	Urinary Tract Infections	2,727	Abortions	518
6	Diarrhoea Diseases	1,244	Open wounds	475
7	Intestinal Worms	1,168	Respiratory Tract Infections	475
8	Rheumatism	864	Skin Diseases	245
9	Dental Disorders	804	Eye Infections	176
10	Ear Infections	696	Tuberculosis	91
	Total	61,217	Total	17,106

Source: Part A. Kericho DH and Kisii DH

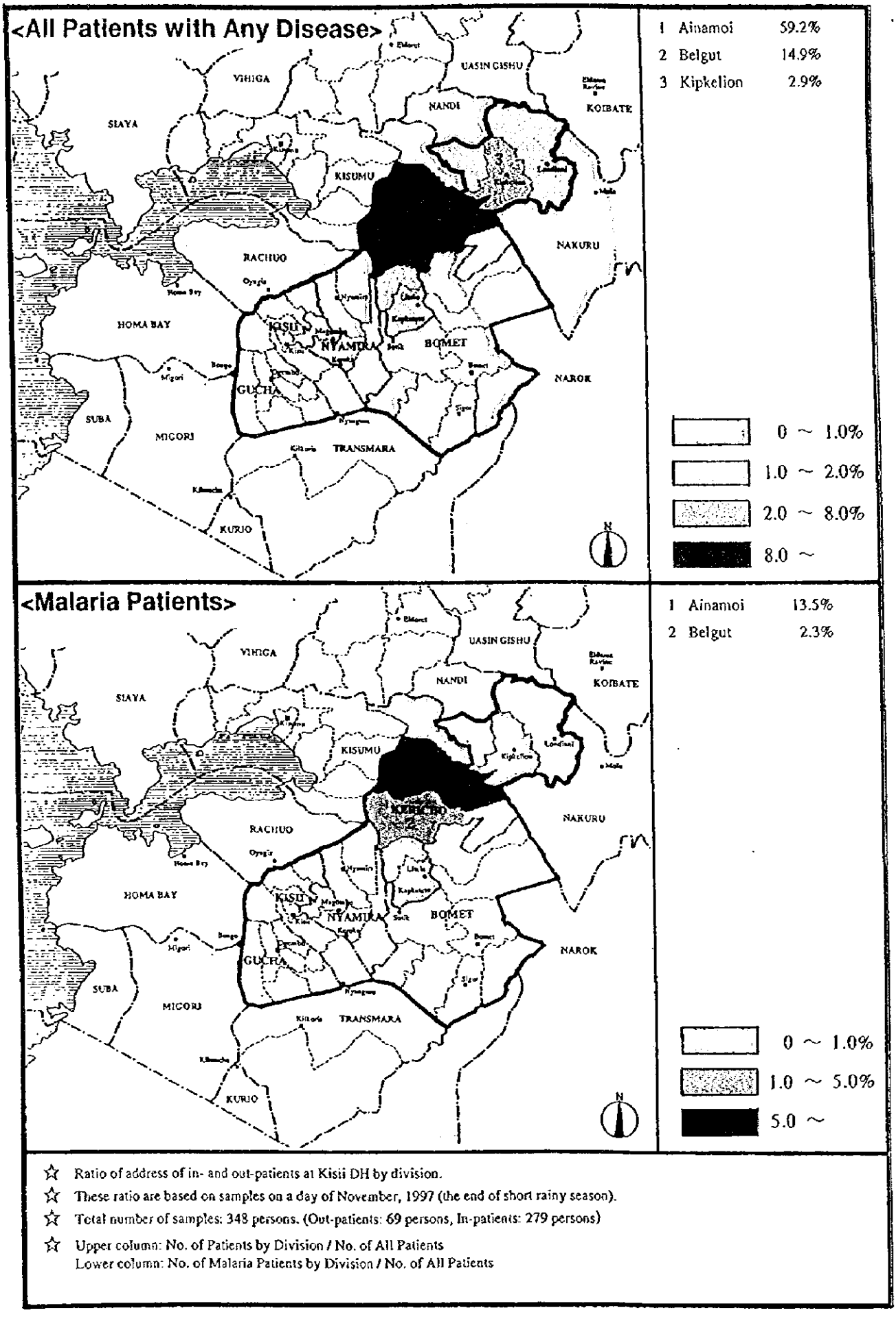
3.1. 2 Service catchment area of DH

Among the DHs in the project site, Kisii DH and Kericho DH have relatively wide service catchment areas. Fig 3-1, 2, and 3 shows the service catchment areas of these two DHs. This data is based on the samples taken on one day in June and November 1997.

Comparing Kisii DH and Kericho DH, the former has a bigger potential catchment population that goes beyond its geo-political boundaries. In fact it serves a population of more than one million including parts of Nyamira, Gucha and other surrounding districts where curative services are restricted.

Table 3-2 Comments on the Service Area of Kericho and Kisii DH

	Kericho DH	Kisii DH
Catchment area	More than 75% of address of in- and out-patients at Kericho DH are concentrated in the Ainamoi and Belgut divisions. The reason for this is that there are other Sub-district Hospitals in Kericho, and the ratio of Health Facilities to population is the highest in the study area.	It is clear that Kisii DH covers not only Kisii District, but also a part of Nyamira, Gucha, Transmara, Rachuo, Migori, Homa Bay, and the neighbouring Districts. This is because of the lack of hospitals and lack of special medical doctors in the neighbouring districts. Though Nyamira District has Nyamira DH, there is no surgery. And for Manga, it seems to be easier for people to access to Kisii DH because of the geographical condition and transportation. For Gucha, it was separated from Kisii last year, it does not have a DH service.
By disease	As for the patients with Malaria, the addresses are limited to the central area only. It means usually Malaria is a disease that can be treated in RHFs. Diseases of the patients from farther divisions from Kericho DH are SVD, BPH, UTI etc.	The area of Malaria patients' addresses is limited to the divisions nearer to Kericho DH. It means Malaria patients go to H/C or DSPs located near their home. Strengthening of RHFs might reduce the number of patients of DH from far place. Diseases of the patients from the surrounding area are TB, Bronchitis, Typhoid, and B. Pneumonia etc.
Seasonal change		June 1997 was a Malaria outbreak season and November 1997 was the end of a short rainy season. In terms of the area of Malaria patients' addresses, in June Malaria spread to Transmara and Rachuo, however in November its spread is limited to several divisions near the Kisii DH.



☆ Ratio of address of in- and out-patients at Kisii DH by division.
☆ These ratio are based on samples on a day of November, 1997 (the end of short rainy season).
☆ Total number of samples: 348 persons. (Out-patients: 69 persons, In-patients: 279 persons)
☆ Upper column: No. of Patients by Division / No. of All Patients
Lower column: No. of Malaria Patients by Division / No. of All Patients

Fig. 3-1 Service Catchment Area of Kericho DH (November 1997)

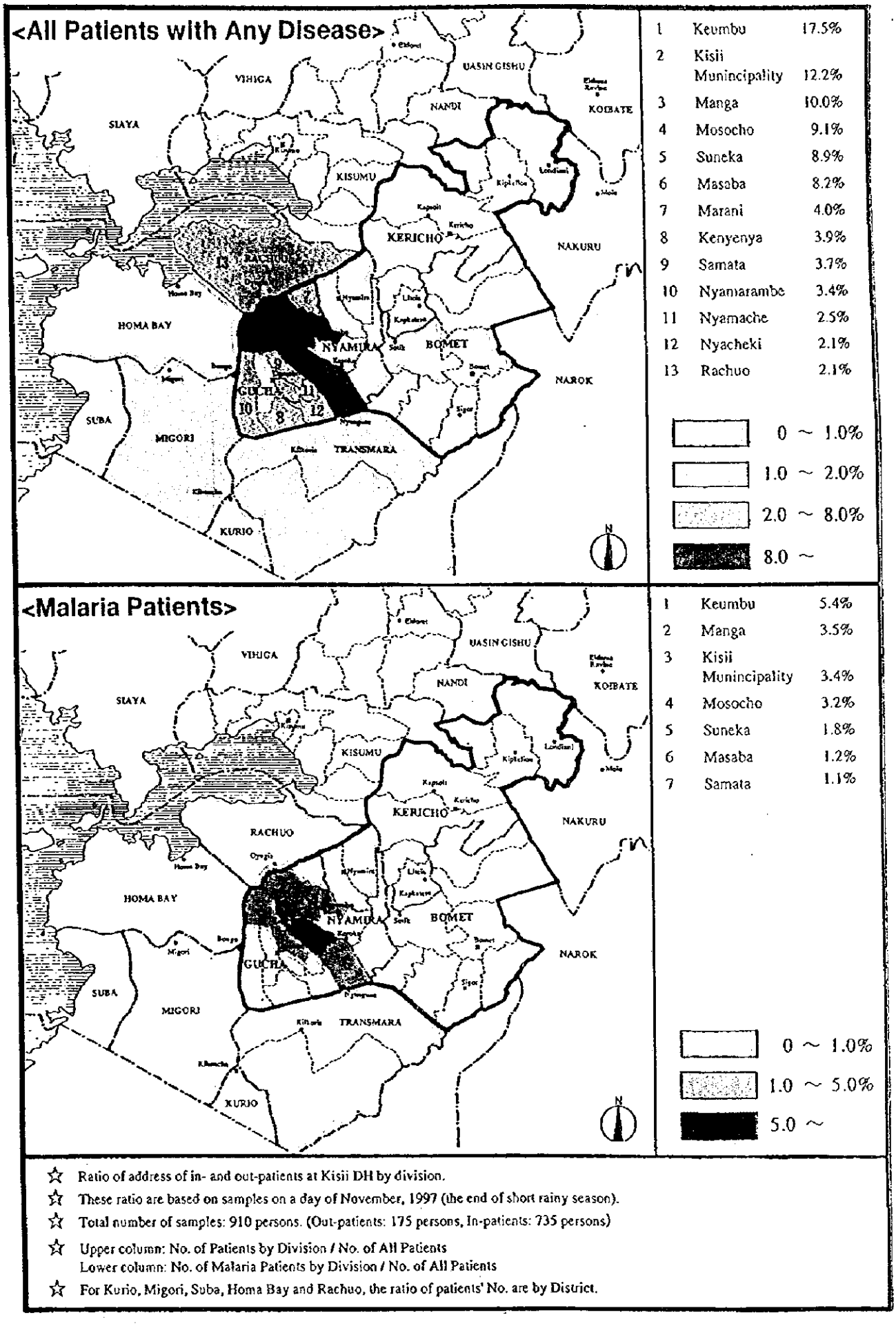


Fig. 3-2 Service Catchment Area of Kisii DH (November 1997)

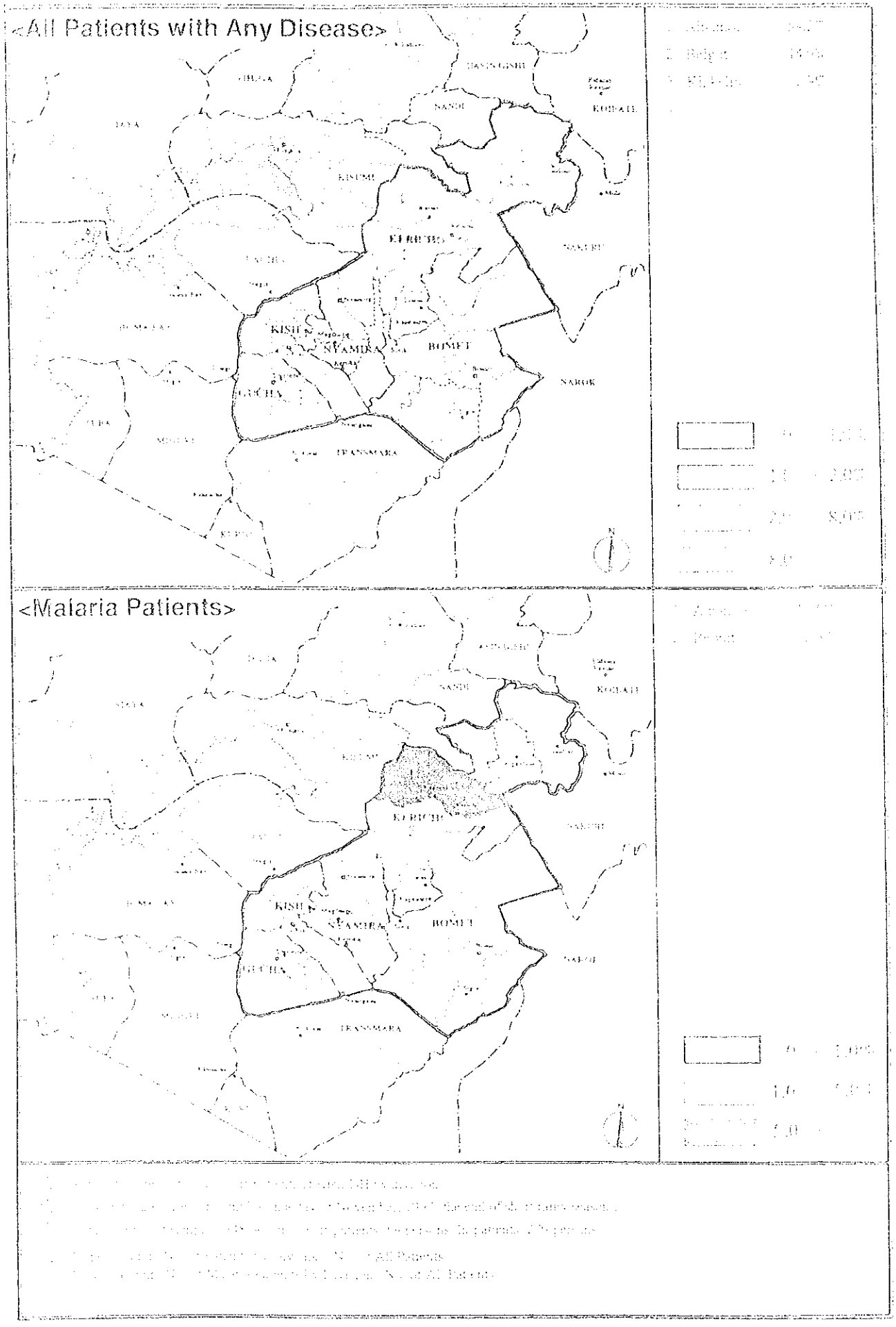


Fig. 3-1 Service Catchment Area of Kericho DH (November 1997)

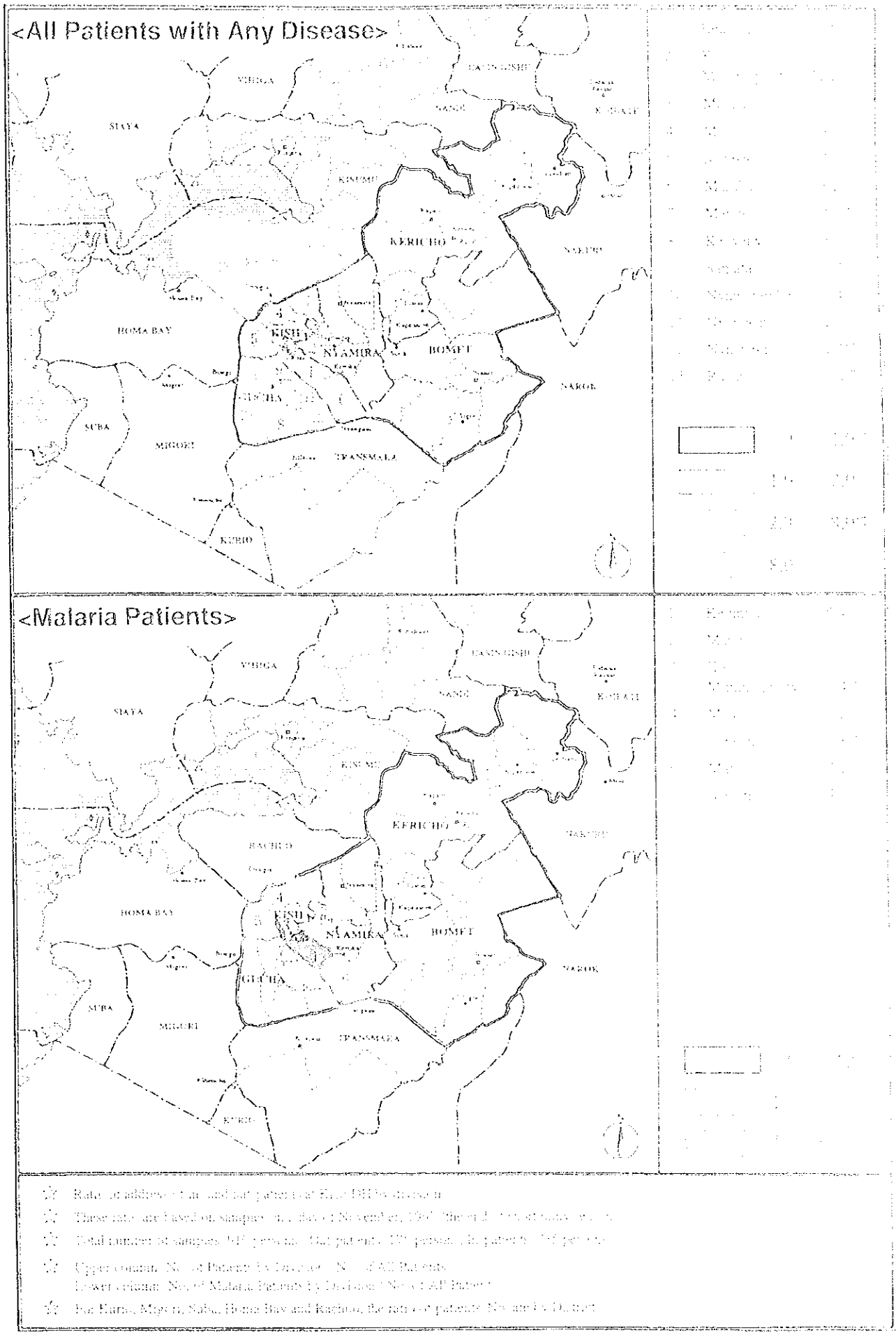


Fig. 3-2 Service Catchment Area of Kisii DH (November 1997)

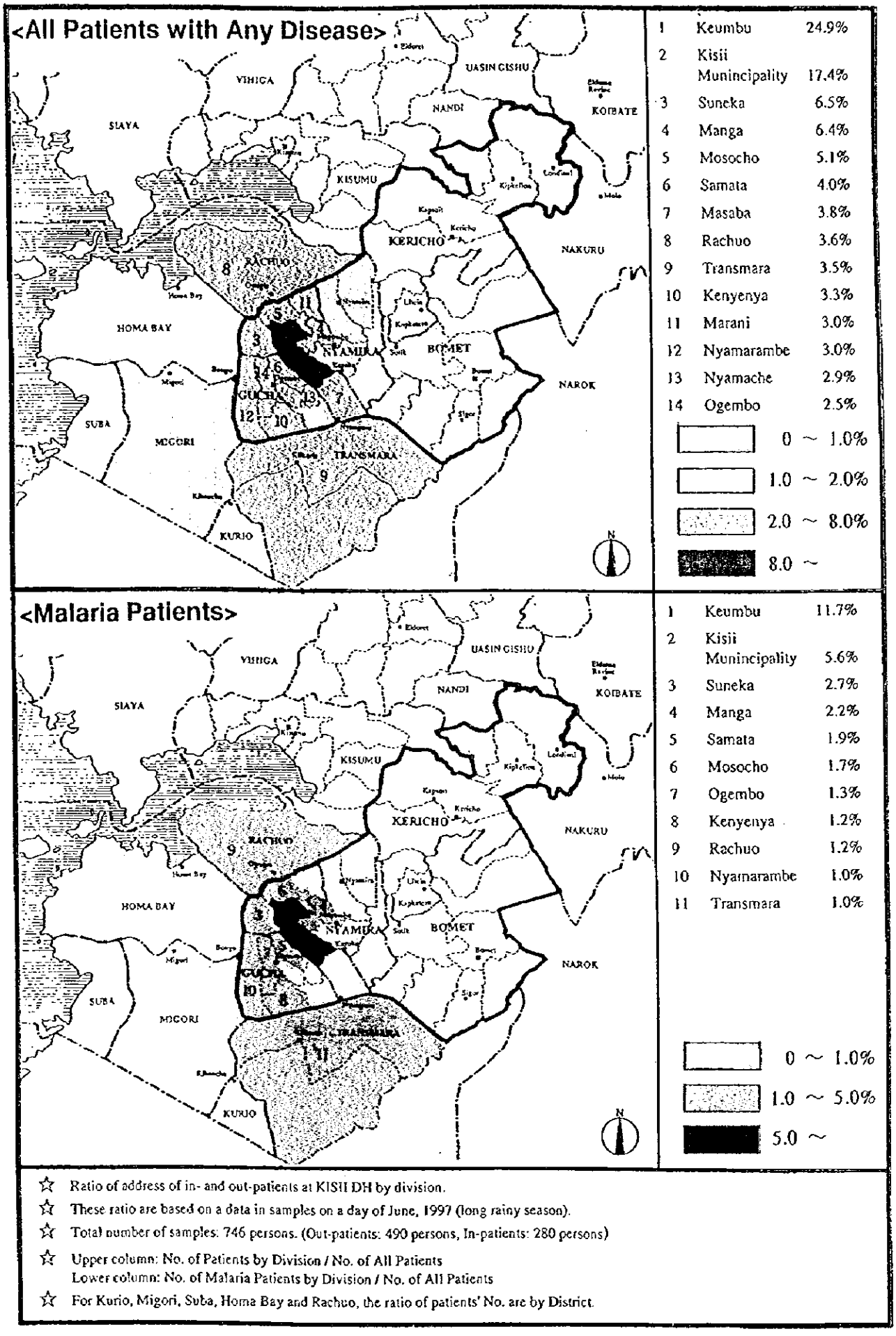


Fig. 3-3 Service Catchment Area of Kisii DH (June 1997)

3.1.3 Facility and Infrastructure

It is assumed that deterioration of facilities and equipment hinders improving the quality of curative service provided at the district hospitals. In fact, there has been no major rehabilitation over the years due to chronic financing problem while the demand for the hospital service exceeds the capacity of the hospitals in particular Kericho and Kisii.

On the hospital facilities, the standard facility components are described in the " Definition and Categorisation of Health Facilities in Kenya", and typical plans for each building of DH are prepared by Ministry of Public Works. (Appendix-4)

The actual conditions of the hospital buildings are briefly described below and summarised in Table 3-3.

Kericho DH

Kericho DH is believed to be built in 1920's during the colonial period. This hospital has been expanded since then, and at present it consists of 26 independent buildings with a total floor area of 5,013 m^2 [Ref. Fig. 3- 4 Site Plan of Kericho District Hospital].

At first, it was started as an A.D.C Dispensary within the Kisumu county council. The present physiotherapy/occupational therapy facilities, were built during this time. Another extension, which includes the present ward three and administration II buildings, was undertaken during the same time.

After the 2nd World War in 1945, the hospital was expanded, with the help of the Italian government. This expansion includes, the MCH/FP building, ward 2, both old and new, Indian ward, current laboratory, kitchen (old) and dental clinic.

In 1972 the current outpatient department was built. In 1983, a further expansion was undertaken including operating theatre, Delivery ward, Maternity ward and General wards, (5/6), Kitchen/stores and new mortuary.

Between 1994 - 1997 another expansion of the eye ward including, eye theatre (incomplete) and PMIU building was undertaken.

Hospital occupies approximate 10 ha. The site has a slope of 1:25. The external spaces are mainly lawns with the exception of the area adjacent to some wards that have a paved area. At this site, there are 26 independent buildings (permanent construction) and one semi-permanent (GCI sheet) Kiosk building for hospital service. There are also several staff houses.

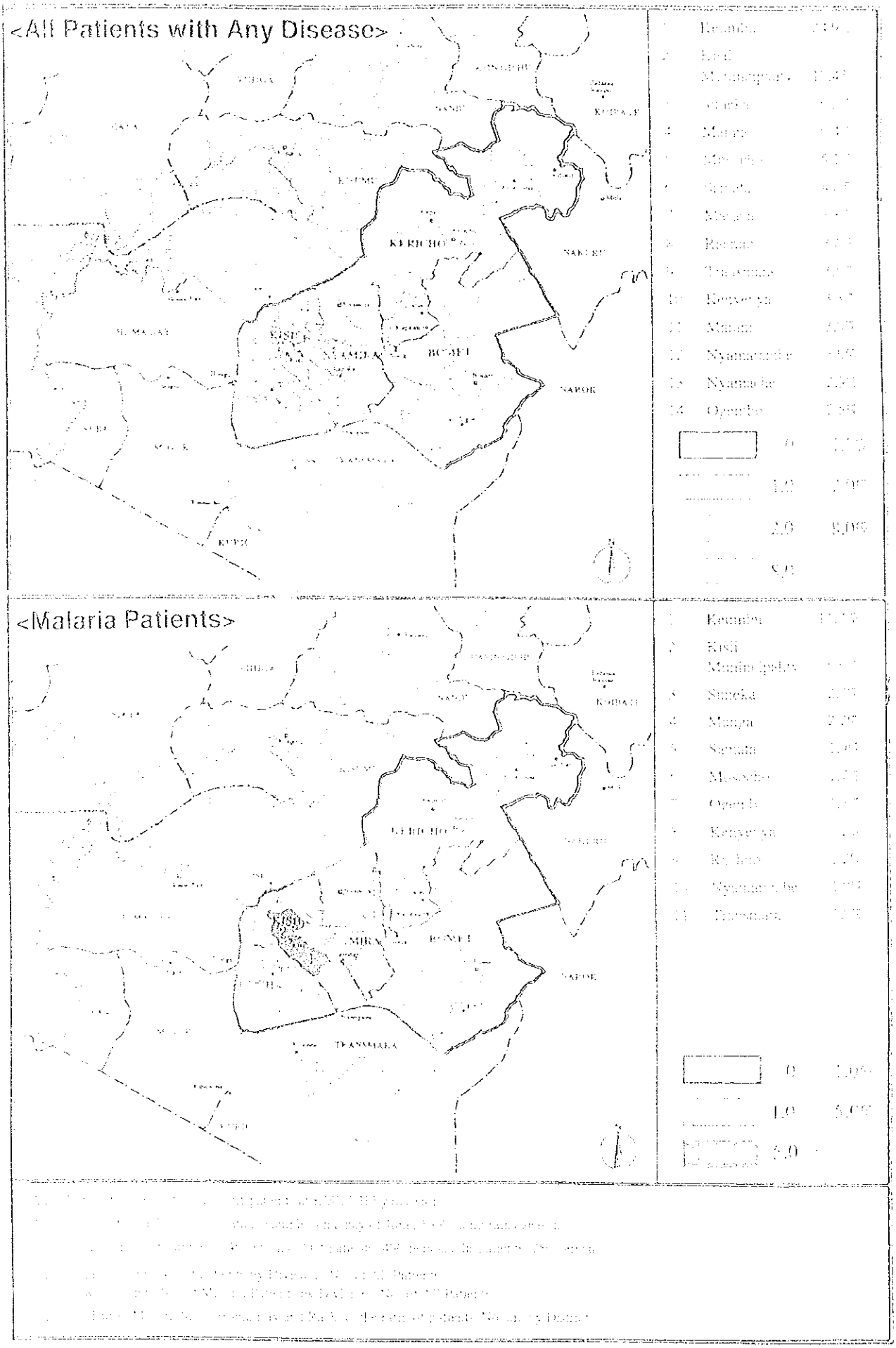


Fig. 3-3 Service Catchment Area of Kisii DH (June 1997)

The main problems of the Kericho DH are as follows:

a) **Lack of a proper site plan:** As a result of repeated expansion without a clear strategic master plan, the 26 buildings have been constructed in places within the hospital site in an disorderly manner. For example, the patients in OPD, MCH / FP, or IPD have to go to the laboratory that is 70-150 meters away. On this journey patients are not protected from the weather, such as rain and sunshine. As shown in the Fig.3-5, the flow line of out-patients, health staff, and service are crossed and overlapped. The hospital needs a strategic site plan of buildings.

b) **Inappropriate use of buildings:** Repeated expansions have resulted in conversion of building use. Many old buildings have been converted from the use for which they were initially designed, for example, the current laboratory was originally an Indian ward. As a laboratory more space for waiting for examination and for a preparation room as a laboratory are required.

c) **Inadequate space:** Due to the conversion of building use, some buildings are very congested. For example, Physiotherapy needs wider space. However it uses a building originally used as a Dispensary.

This DH has about an out-patient attendance of 250 daily and about 45 in-patient admissions on average. OPD and MCH buildings have not enough space for waiting and are very congested.

On the Nursing Unit, the designated bed capacity of this DH is 217, however only 127 beds are currently available. The rest are unusable because of damage or breakage.

This hospital has more than 15,000 in-patients per year and its average BOR (Bed Occupancy Rate) in 1997 was 106%. The seasonal change of BOR in each ward is shown in Fig. 3-8. The capacity of ward 2 and 3 does not meet the demand.

The floor area per bed in Ward 1 and Ward 3 is too small. The expansion of these wards should be considered together with an increase in the number of beds.

Table 3- 3 Capacity of Nursing Unit in Kericho DH

Department	Floor area (m^2)	No. of Beds (Total)	No. of Beds (No damage)	Floor Area/Bed (m^2/bed)	BOR (1997) (%)	Remarks
Ward 1	104.4	20	20	4.2	57	Eye ward
Ward 1 (new)		0	0	-	-	No equipment
New ward 2	163.64	30	10	8.2	149	Paediatric ward
Ward 2 Old	163.64	0		-	-	Not in use
Ward 3	54.72	12	11	2.5	165	Isolation ward
Ward 4	201	30	13	13.4	95	Paediatric Isolation
Ward 5	384	34	20	9.6	137	Female general
Ward 6	384	36	20	10.1	118	Male general
Labour ward	193	8(m) / 7(c)	6(m) / 7(c)	11		
Maternity ward		36	36		60	

Source: JICA Study Team

d) **Incomplete facility component:** The facility does not have a full set of services catalogues nor a full range of facility components. In particular, services such as psychiatry and casualty are affected.

e) **Unused buildings:** Some buildings and rooms are currently not in use, because they have been left unrepaired after vandalism.

f) **Poor sanitary environment:** Some of the buildings are in very poor sanitary condition, especially, the toilet, and shower rooms. This situation seems to have occurred because of patients' attitude and knowledge about sanitation.

g) **Poor maintenance of buildings:** Much damage was seen in most of the buildings, and they are left in unrepaired condition. The condition of each building is shown in Appendix-10. The major problems are as follows:
   - Foundations: The external ground level is above the building floor. This causes rain water to drain into some buildings. It seems to have occurred as a result of deposition of fill during construction.
   - Walls: Most of the walls are in a poor state of repair with damp and moss especially on the concrete blocks.
   - Roofs: Materials used for the roofs are Corrugated Asbestos Sheet or Galvanised Iron sheet. A number of roofs are suffering from rain leaking that has damaged the walls, and ceilings, and has also spoiled medicines.
   - Rainwater gutters/ Fascia boards: Most of the rainwater gutters have clogged, and consequently do not drain, because of lack of periodic cleaning.

h) Water supply system: Water supply is inadequate to meet the demand. This is caused by the lack of capacity of the water tank and water leakage from the tank and pipes.

(2) Longisa DH

Longisa DH was built in 1988 with support from the Italian Government, however its construction work has not been completed yet. Water supply for this hospital just began in June 1998. In-patient service was started recently, and the number of in-patients is still very small.

The construction work of Longisa DH was divided into the following two phases:
- Phase I: Construction of main hospital building, 2type D houses, 2 type E flats, and installation of the generator.
- Phase II : Construction of the mortuary, 1 type D house and 10 type E flats, access road, and external works, furnishing and fitting in Kitchen and Laundry, provision of support services(Water and Electricity)

Phase I was completed in 1991, however phase II is unfinished. Construction of staff houses, approach way, and mortuary remain. The hospital is not equipped with any kitchen and laundry.

This building is of a multi-storey type. Though the hospital building has been kept clean and in relatively good condition, it is not fully functional.

(3) Nyamira DH

Nyamira DH was established in 1979 as a general hospital, with 230beds. This hospital consists of the following departments.

Table 3-4 Floor area of Nyamira DH

	Department	Area (m2)		Department	Area (m2)
1	Administration	215.6	8	Paediatric Ward	740.0
2	OPD	806.4	9	Amenity ward	403.0
3	Laboratory	114	10	Psychiatric ward	806.4
4	X-ray	403.2	11	Kitchen/Stores	422.6
5	Theatre	164.6	12	Laundry/Boiler	302.4
6	General ward (M/F)	638.4	13	Mortuary	97.75
7	Maternity Ward	638.4		Total	5752.75

Source: JICA Study Team (November 1997)

The condition of this DH seems better than other hospitals in the Study area. The existing condition of this hospital is shown in the Annex-11. The following problems were found:

a) **Inadequate Capacity:** The OPD/Casualty, ward and the offices are over utilised. The condition of the Nursing Unit is shown in the following table. Its capacity seems appropriate. On the other hand, the theatres are under-utilised due to the absence of a surgeon, though the theatre is well designed and equipped.

Table 3 –5 Capacity of Nursing Unit in Nyamira DH

Department	Room size (m^2)	No. of Beds (Operational)	No. of Beds (Designed)	Floor Area/Bed (m^2/bed)	BOR (1997) (%)	Remarks
Maternity ward	638.4	42	42	4.2	71	
General ward (male/female)	638.4	92	80	-	43	
Paediatric ward	740	60	36	8.2	67	
Amenity ward	403	18	14	-	55	

Source: JICA Study Team

b) **Water leakage from the roofs:** Most of the roof is flat reinforced concrete. The exception are roofs to the amenity ward, X-ray and the mortuary. The water- proof sheet has serious damage, and is in need of repair.

c) **Plumbing works:** Plumbing works in the hospitals need periodic maintenance.

d) **Damages:** Some damaged windows, doors, and ceilings are left unrepaired.

(4) Kisii DH

Kisii DH commenced operation in 1916 with a small unit of current OPD, to serve the local people during the colonial era. This facility has been expanded on several occasions, and it now consists of more than 20 independent buildings with a total building area of 4,715m^2. There is no uniformity in construction materials, style of architecture and age of buildings.

The hospital is classified as a District Hospital, and actually serves a population of more than 1 million. Its catchment area includes a part of Nyamira, Gucha and other neighbouring districts. Because of its large catchment area, this hospital is always very crowded.

This hospital is sited on 4.1 ha land which has a gentle slope of about 1:15.

The main findings and problems of the Kisii DH are as follows:

a) **Poor site plan:** The hospital buildings are located in a disorderly manner, because they have been constructed wherever empty space was available, without strategic master plan. [Ref. Fig 3-6 : Site Plan of Kisii DH]

   a-1) Congestion and confusion of logical flow line: As shown in Fig.3-7, the functional layout plan is mixed, and logical flow line of out-patients, health staff and service are crossed. [Ref. Fig.3-7: Site Plan of Kisii DH (Functional Relationship)]

   a-2) Poor security: It is very difficult to control the flow of visitors and outpatients, because the hospital land is not fenced properly and the building are located disorderly. The services by the health personnel and staff, and the security control are hampered by a large number of visitors.

   a-3) Poor ventilation: The area near the entrance is crowded with small buildings that have been built wherever space was available. This has lead to a bad environment with poor ventilation, poor sunshine, and congestion.

   a-4) Complicated piping and wiring system: Because of the repeated expansion, the water pipes and the electricity wires are also problematic. Nobody, even the maintenance person, knows the existing situation regarding the pipes and the wires. It makes the maintenance work more difficult/ and dangerous.

b) **Capacity:** Due to its excess demand, the hospital is over-utilised, especially the general OPD and the entire IPD.

   b-1) OPD: The number of out-patients is about 6,000 persons per month. The number of patients of MCH is about 2,500 cases per month. The OPD and MCH buildings are very congested and patients have to wait for a long time.

   b-2) Nursing Unit: Kisii DH received approximately 32,000 in-patient admissions per year in 1996. That is 90 in-patient admissions per day on average. Average of length of stay in this hospital is around 7days, and its bed occupancy rate (BOR) was 194% in average (in1996). As shown in Fig. 3-8: BOR in Kisii DH, the average BOR of ward 1,5, 6, 8 and 9 is over 200%.

Table 3-6 Capacity of Nursing Unit in Kisii DH

Department	Floor area	No. of Beds (Actual)	No. of Beds (Design)	Floor Area/Bed	Admission / month in 1996	Length of stay in 1996	BOR (Annual Average, 1997)	Remarks
	(m^2)	(beds)	(beds)	(m^2/bed)	(Pers/m2)	(days)	(%)	
Ward 1	105	24	23	4.57	2,750	7.0	208.14%	Gynaecology
Ward 2	241	32,1(c)	34	6.69	2,059	9.8	167.17%	Female Surgical
Ward 3	220	29	30	7.59	1,928	10.2	163.37%	Male Surgical
Ward 5	155	28	27	5.96	3,561	6.5	232.67%	Male Medical
Ward 6	137	22	23	5.48	5,123	6.0	329.79%	Female Medical
Ward 7	117	17,5(c)	24	7.31	3,476	5.8	197.11%	Paediatric Medical
Ward 8	157	28,30(c)	33	3.14	6,731	5.3	278.41%	Paediatric
Amenity Wing	0	16	16		268	34.7	99.50%	Amenity
Ward 9	107	20	20	5.35	250	76.6	227.55%	Isolation
Ward 10	42	5	32	8.4				Psychological
Maternity ward	260	30	5	8.39	5,833	5.2	224.59%	Maternity
Total	1541	251,36(c)	267	5.30	31,979	7.14	194.20%	

Source: JICA Study Team

c) **Inefficient use:** The conversion of buildings, now used for different purposes from their original intention has brought about an inefficient working environment.

d) **Lack of connection:** Only a limited area, the operation theatre, maternity ward, ward 2 and 3, are connected with a roofed and paved walkway. The hospital buildings should be connected by the roofed walkway to protect patients from rain and strong sunshine.

e) **Poor sanitation:** Because of the lack of water supply, low pressure of water supply and water leakage, some water closets are not functioning. In addition, some people do not know how to use water closets, and as a result, some of them are left in poor sanitary condition.

f) **Poorly maintained buildings:** Some damages on roofs, windows, and doors are left unrepaired.

g) **Slow building construction:** Some buildings are still under construction. WB has supported them. The construction work stopped once and, then, was resumed in June 1998.

Table 3-7 General Condition of District Hospitals

		Kericho DH	Longisa DH(Bomet)
General	Area of site No. of buildings Construction year	Approximately 8.0 ha 26 independent buildings. This hospital started in the 1920's.	Multi-storey type building. In 1988 with support of the Italian Government..
Services	No. of patients No. of Beds BOR :	OP : App. 250p/day IP : Admissions App 1,080p/m 217 beds 80% (Ordinary season) Max400%	Approximately 100p/day. (20p/day for MCH/FP)
No. of staff		Total 341 pers. (MD: Conlt.3, MO 5 Dent.2, CO 36, N: KRN 21, ECN 122)	
Building	Area of Hosp. Area of Ward	5,013m2 23.1m2/bed 1,648.4m2 7.5m2/bed	4,737m2 1,541m2
Functional situation		Repeated expansion without planning has resulted in a layout which is inconvenient for operation of the hospital. Inadequate space: Due to conversion of use of buildings, there is some conflict in space use. Lack of casualty department.	IPD service and Delivery service has just begun recently. Only OPD services, MCH/FP, Laboratories and therapy departments are operating.
Condition of Bldg.		Most of the buildings are very old and badly damaged such as breakage of windows, doors, and ceilings, blocked pipes, and water leaking, and they are left as they are.	The facility has all the components required for a hospital. However, some buildings have not been completed yet. IPD has begun operation recently. The building has been kept clean.
Water supply		Inadequate to meet the demand (220,000 l/day), because of the shortage of supply and leakage of water tank. No system for rain water harvesting.	Water demand:100,000l/day (In the case of fully operational) Pumping and treatment plant have begun to supply water recently. Rain water harvesting system from roof is installed only for the corridor.
Sanitation		Sewage: Sewage System of old buildings is in poor state due to broken manholes and blocked sewer line. Disposal: Hospital waste including special hospital waste is collected by public system of municipality.	Sewage: Sewage System has been operating well. Disposal: Lack of an incinerator or pits for solid waste disposal.
Maintenance		6 technicians ME inventory has not been upgraded since 1991. Kericho HMU has technical exchanges with Kisumu workshop and sometime repairs HC's equipment.	3 technicians and 1 craftman. MOH's format for Maintenance Records have not been used. Activity of HMU is not so high and should be motivated strongly.
New or ongoing projects		A project for expansion of eye ward and a new eye theater. Construction work was almost completed, but it has no equipment. Buildings of isolation ward (ward3) were previously condemned by MoPW.	Staff houses, Staff apartment blocks, bungalows, drive way, parking, landscaping works by contractor are incomplete.

		Nyamira DH	Kisii DH
General	Area of site	11 ha	4.1 ha
	No. of buildings	2 storey building	32 buildings
	Construction year	In 1979.	The oldest bldgs were built in 1916.
Services	No. of patients	OP : App. 80p/day, 2,300p/m IP : App 1,380p/m MCH : App. 320p/m Labo.: App. 1,831case/m	OP : App. 500-600p/day, IP : Admission App 1,400p/m
	No. of Beds	230beds	251 beds, 36cots
	BOR :	70% (Ordinary season) Max300%	194 %(Ordinary season) 90 operations/m in 2 theatres.
No. of staff		Total 591pers. (MD: MO 3. CO 16. Nurse: KRN 21, ECN 172)	Total 744 pers. (MD: Conlt.7, MO 3, Dent.1, CO 49. Nurse: KRN 52, ECN 235)
Building	Area of Hosp.	5,752.75m2 25.0m2/bed	4,737m2 16.9m2/bed
	Area of Ward	2,185m2 9.5m2/bed	1,541m2 5.5m2/bed
Functional situation		Over utilization of OPD/casualty, ward and the offices. Back flow of the FP clinic's patients in MCH/FP section. Theater is under utilized, due to lack of a surgeon in the hospital.	Repeated expansion without planning has resulted in a layout which is inconvenient for operation of the hospital. Lack of security: No back gate and poor building facility layout hamper control of visitors.
Condition of Bldg.		Most of the roof is flat reinforced concrete with felt water proofing. Water proofing, sheet has serious damage, and some rooms are unused because of rain water leakage due to the lack of maintenance. Damaged windows, doors, and leaking pipes are left as they are.	Most of the buildings are very old. There are some problems in ventilation, lighting and plumbing, because of the repeated expansion or renovation of old buildings. Damaged windows, doors, and leaking pipes are left as they are..
Water supply		Water demand:80,000l/day Supply is inadequate to meet the demand, due to limited tank capacity and tank leakage. No system for rain water collection in use.	Water demand:180,000 l/day Inadequate to meet the demand, because of inadequate capacity of elevated tank and ground water reservoir. However, rain water is not collected for use. Water supply pipeline is very complicated, and it has water leakage, disconnection, and route mistake. Inside of elevated tank is rusted.
Sanitation		Sewage: Sewage System has been operating well. Disposal : Hospital waste including special hospital waste is burned and dumped.	Sewage : Sewage System is often blocked, and septic tank is also blocked because of lack of regular maintenance. Disposal : Hospital waste including special hospital waste is usually burned. However, sometimes they are left for a long time before being burned.
Maintenance		2 Technologists, 2 Technicians, 1 Craftsman, 2 Supportig Staff Informal technical exchanges between Kisii HMU and Nyamira HMU. HMU depends on Kisumu workshop for making an inventory, however the connection is not close. Equipment Inventory has not been revised regularly.	2 Technologist, 2 Technicians, 6 Craftsman, 2 Supporting Staff Informal technical exchanges between Kisii HMU and Nyamira HMU. HMU depends on Kisumu workshop for making an inventory of medical equipment, so revision of the inventory is not done regularly.
New or ongoing projects			The project for construction of 5 buildings for Pharmacy, Surgical contraceptive unit, MCH, Dental and Injection unit supported by WB is under way. Adm. Department will be moved outside the hospital.

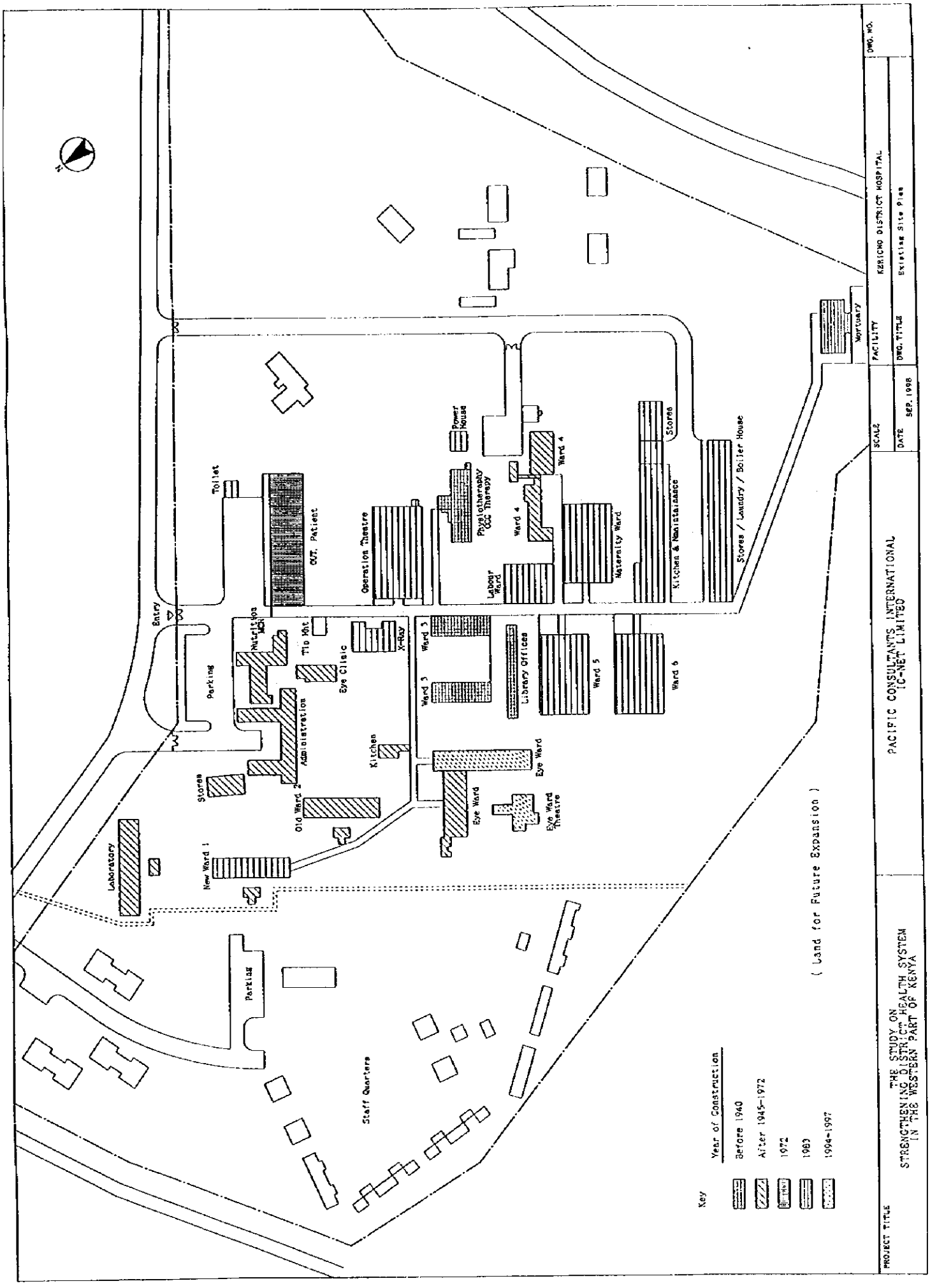


Fig. 3-4 Site Plan of Kericho District Hospital

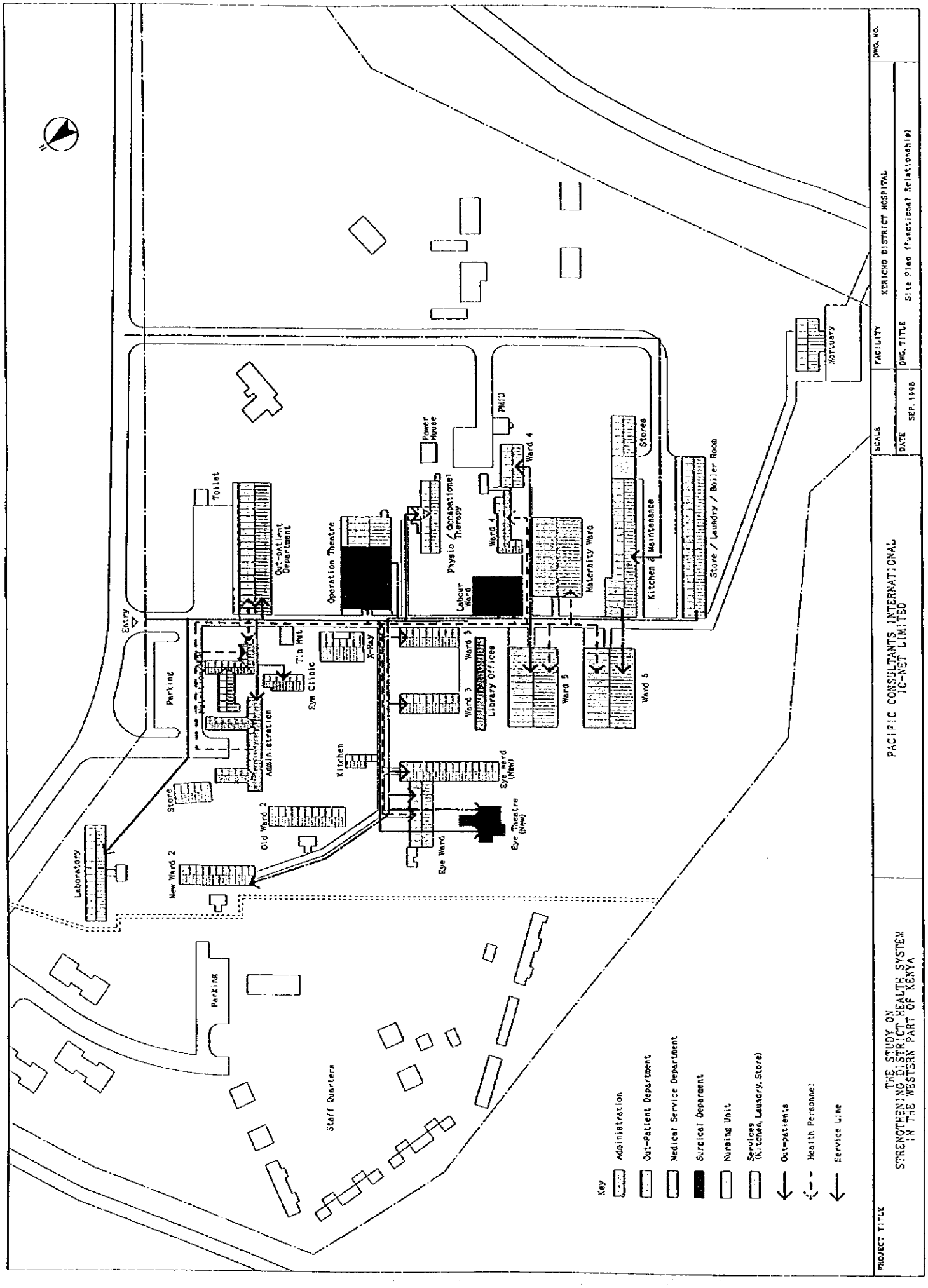


Fig. 3-5 Functional Relationship of Kericho DH

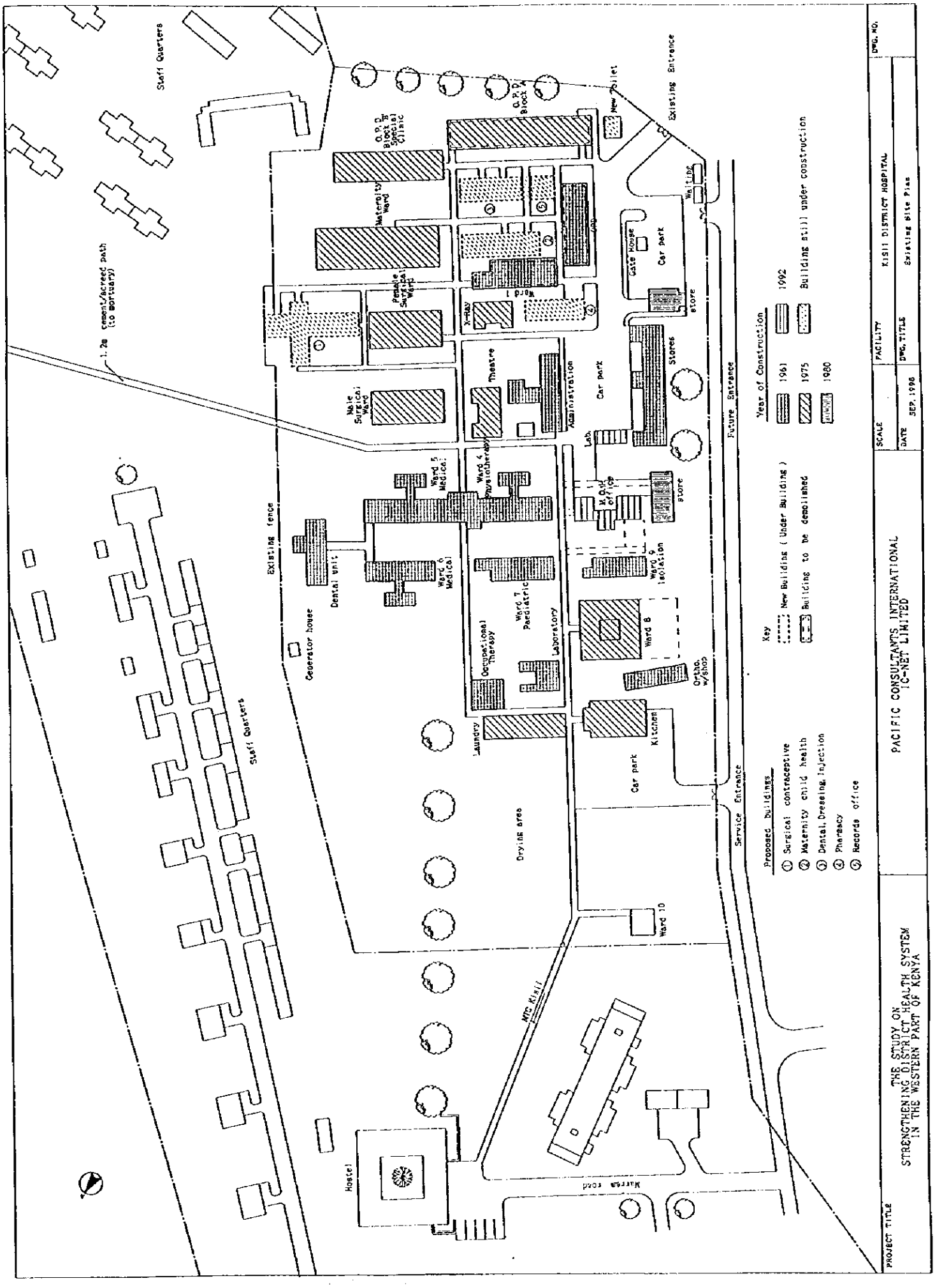


Fig. 3-6 Site Plan of Kisii District Hospital

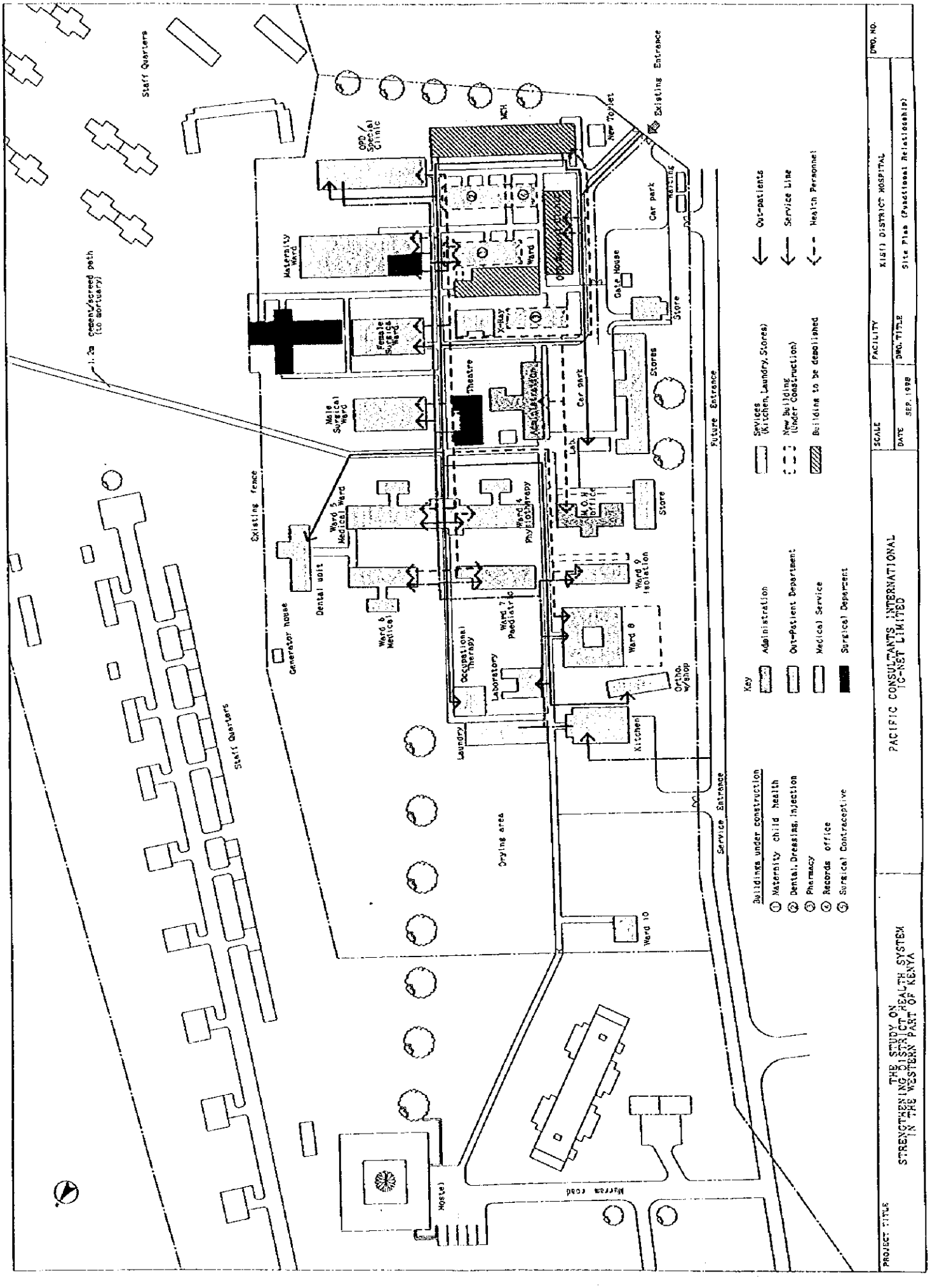
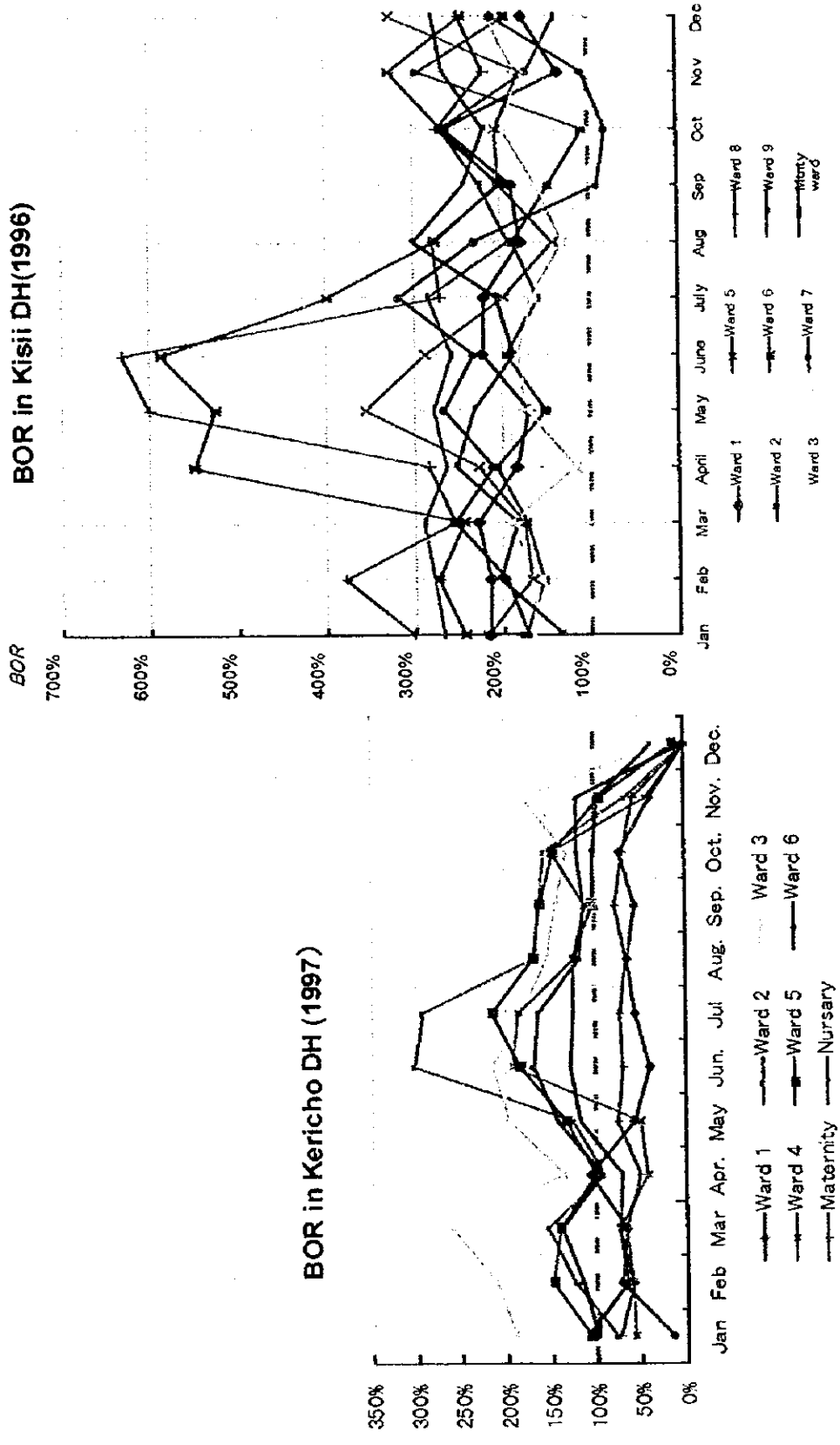


Fig. 3-7 Functional Relationship of Kisii DH

Figure 3-8 BOR in Kericho DH and Kisii DH



3.1.4 Equipment

General

The following is general description of the existing situation regarding medical equipment in the district hospitals.

a) A lack of medical equipment
A current state of medical equipment at the DHs is shown in Table 3-4: Current Condition of Medical Equipment of DHs. Unavailability of medical equipment hampers the diagnostic capability. The problems are more serious in X-ray rooms, laboratories, theatres and physiotherapy.

b) Obsolete medical equipment
The average age of most medical equipment in the DHs is estimated to be more than 15 years. It is obsolete and its performance is poor.

c) Shortage of consumables
X-ray services and laboratory services are sometimes obliged to stop their services because of shortage of X-ray films and laboratory reagents.

Many piece of medical equipment are damaged and left. Although there are Hospital Maintenance Units (HMUs) in the DHs, unrepaired who should maintain medical equipment and facilities, their capability is very limited, both in terms of quality and quantity. They are too busy with repairs to do preventive maintenance work. Specifications of equipment are not available and the maintenance record is not filled in order.

The existing equipment condition at each hospital

(1) Kericho DH

a) Current state of equipment: In the operation theatre, essential medical equipment such as suction units, operations room lamps, and the emergency power supply system does not work. In the X-ray room, only one X-ray machine out of five is kept in good condition. In the laboratory, a variety of equipment does not work to support.
b) Organisation: HMU is under the Medical Superintendent and reports to him directly. HMU also reports technical matters to the head of Medical Engineering Services of MOH.
c) Staff: 6 Technicians
d) Working allocation at HMU: 50% for facilities and hospital equipment, and 50% for medical equipment
e) Records: Inventory of medical equipment and records of repair activities are kept. But the inventory of medical equipment is as of 1991 and needs updating. The records are not used for statistical purpose.

f) Repair procedure: There is an established procedure. HMU submits a maintenance budget to the District Health Management Team every three months and receives its approval.

g) Preventive maintenance: HMU is supposed to do preventive maintenance for all equipment in the hospital every two months.

h) Procurement procedure of spares: There is an established procedure.

i) Procurement of consumables: Each department submits requests.

Kericho HMU exchanges technical experience at the Workshop held at Kisumu. In some cases, health centres ask HMU to undertake their repairs. However the HMU doesn't respond to their request.

(2) Longisa DH

a) Current state of equipment: In spite of the new buildings, hospital services are limited to only out-patients because of a water supply shortage.

b) Organisation: HMU reports to the Medical Superintendent.

c) Staff : Three technicians and one artisan

d) Working allocation at HMU : 75% for medical equipment, and 25% for electrical repair

e) Records: They are not using any Forms defined by MOH because there are no formats in this hospital.

HMU of Longisa DH is not active. Motivation of staff is required.

(3) Nyamira DH

a) Current state of equipment: In the X-ray room, only one X-ray machine is workable. In the laboratory, four out of five microscopes do not work. In the main operation theatre, the autoclaves and anaesthetic machine are broken and inoperative, and the automatic switch for the generator is out of order.

b) Organisation: HMU is under the direct control of Medical Superintendent and reports to him. HMU also reports technical matters to Provincial Medical Engineer in Kisumu.

c) Staff: 2 Technologists, Two technicians, one artisan, and two subordinate staff.

d) Working allocation at HMU : 75% for facilities and hospital equipment, and 25% for medical equipment

e) Records: Records of medical equipment inventory and repair activities are kept in order. Records of medical equipment are out of date. The records are not used for statistical purpose.

f) Repair procedure: There is an established procedure. However, they ask Kisumu Workshop to repair equipment. For example, they had an incubator repaired at Kisumu. There are informal technical exchanges with Kisii HMU and Nyamira HMU.

g) Procurement procedures of spares: There is an established procedure.

h) Procurement of consumables: Each department submits requests.

Nyamira HMU depends on Kisumu workshop for making an inventory of medical equipment. This HMU is not closely connected with Kisumu workshop, so revision of the inventory update has not been done timely. Nyamira HMU should make the inventory itself.

(4) KISII DH

a) Most of the key medical equipment in the X-ray room, the physiotherapy room and the operation room does not work.

b) Organisation: Hospital Maintenance Unit (HMU) belongs to Administration Department and reports to Medical Superintendent through Administration Officer. HMU also reports technical matters to Provincial Medical Engineer in Kisumu.

c) Staff : Two technologists, two technicians, six artisans, and two subordinate staff

d) Working allocation at HMU: 70% for facilities and hospital equipment, and 30% for medical equipment.

e) Records: Records of medical equipment, spare parts, repair activities are kept, but not in order. Statistical use of records has not been done.

f) Repair procedure: There are an established procedure and informal technical exchanges with Kisumu workshop and Nyamira HMU.

g) Procurement procedures of spares: There is an established procedure. 100,000 Kshs is given as a budget for maintenance in this year.

h) Procurement of consumables: Each department submits requests.

Kisii HMU depends on Kisumu workshop for making an inventory of medical equipment, so the inventory is not updated timely. KISII HMU itself should update the inventory.

If new equipment is installed, the maintenance system of DHs should be reconsidered.

Table 3-8 Current Condition of Medical Equipment at DHs

KERICHO DH

Section	Equipment	Condition	Section	Equipment	Condition
Male Ward	Sterilizer	○	IB ward	Sphygmomanometer	○
	Sphygmomanometer	●		Stethoscope	○
				Sterilizer	○
Maternity ward	Sphygmomanometer	○		Scale	○
	Scale	○			
			Eye clinic	Sterilizer	○
Female ward	Sterilizer	○		Slit lamp	○
		○			
Delivery ward	Heater	○	Dental	Dental chair	△
	Scale	○		Sucker	●
	Suction pump	○		Sterilizer	○
	Delivery couch	△△			
	Oper. room lamp	●	Blood bank	Centrifuge	●
	Sterilizer	●		Refrigerator	○○
				Incubator	●
Children ward	Sterilizer	○		Water bath	△
	Sphygmomanometer	○			
	Oxygen regulator	○	Haematology	Colorimeter	○
				Incubator	●
Physiotherapy	Infrared lamp	○○		Balance	●
	Ultrasoun unit	○		Mixer	○
	Electric stimulator	○○			
	Cradle warmer	○	Microbiology	Hood	△
	Shortwave unit	●			
	Wax bath	○	parasitology	Hot air oven	△
	Refrigerator	△		Microscope	△
Plaster room	Cutter	○	X-ray room	X-ray unit, general	△
				X-ra unit, dental	○
Operating theatre	Suction unit	○○●●		X-ray unit, B.R.S.	●
	Diathermy unit	○		Ultrasound diag.unit	△
	Sterilizer	○●		Autom. processor	●
	Operating table	△△			
	Anaesthetic unit	○○			
	Ope. room lamp	△●			
	Small ope. lamp	●			
	Trolley	△△△			
	Emerg.power source	△△△			
	Autoclave	○			
	Sphygmomanometer	○			
	Stethoscope	●			

○: available, △: broken, but available, ●: broken

Longisa DH

Section	Equipment	Condition	Section	Equipment	Condition
X-ray room	X-ray unit, mobile	○	Outpatient	B.P. machine	●○
				Stethoscope	○○
Laboratory	Microscope	○○		Baby incubator	○○○○
	Centrifuge	○		Refrigerator	○
	Hemoglobin meter	○		Baby scale	○
	Sterilizer	○		Adult scale	○○●
				Exam. couch	○○
Theater	Oper. room light	○○		Screen	●○
	Operating table	○		Foctoscope	○
	Autoclave	○○		Autoclave	○
				Drip stand	○
Dental	Dental chair	○		Drug trolley	○
				Exam. light	○

○: available, △: broken, but available, ●: broken

Nyamira DH

Section	Equipment	Condition
X-ray room	X-ray unit, general	○●
	X-ray unit, dental	○●
	X-ray unit, mobile	●
	Auto. processor	○
	Drier	○
	Name printer	○
	Film viewer	●
	X-ray unit, abdomen	●
Laboratory	Refrigerator	○○○
	Centrifuge	○○○△
	Water bath	○○●
	Hot air oven	●○○
	Deep freezer	○
	Microscope	○●●●●
	Hb counter	○
	HIV screening unit	○○
	Hemoglobin meter	○
	Analytical balance	○
	Sterilizer	●
	PH meter	●
Minor theatre	Oper. room light	○
	Operating table	○
Casualty	B.P. machine	○
	Stethoscope	○
ENT	Sterilizer	○
	Film viewer	○
	B.P. machine	○
	Stethoscope	○
Physiotherapy	Microwave unit	○○
	Stimulator	○
	Shortwave unit	○
	Ultrasonic unit	○
	Infrared light	●●●●●
	Cradle warmer	△
	Wheel chair	○
	Parallel bar	○
	Bicycle	△△

Section	Equipment	Condition
Physiotherapy	Cryotherapy	○
	Wax bath	●
Dental	Dental chair	○
	Sterilizer	○
KEPI	KEPI	○
	Refrigerator	○○
Nutrition	Scale	○○
	KEPI	○
Family plann.	B.P. machine	○
	Inspect. light	○
	Exa. couch	○
	Autoclave	○
	Stethoscope	○
Outpatient	Stethoscope	○
Occup. therapy	Sewing mach.	●
Pharmacy	Balance	●○
	Refrigerator	○
	Autoclave	●
Amenity hall	Stethoscope	○
	B.P. machine	○
	Sterilizer	○
	Wheel chair	●
Female ward	Exa. light	○
	Exa. couch	○
	Stethoscope	○
	B.P. machine	○
	Oxygen reg.	○
	Wheel chair	●
Male ward	B.P. machine	○
	Stethoscope	○
	Wheel chair	○

Section	Equipment	Condition
Children ward	Scale	○○○
	Steam kettle	○
	Oxygen reg.	○
Main theatre	Exa. light	○○○●
	Stretcher	○○○○
	Autoclave	●●
	Oper. light	○
	Oper. table	○○
	Suction unit	○
	Anaesthetic mac	○●
	Suction unit, m	○
Maternity ward	B.P. machine	○
	Stethoscope	○
	Scale	○
	Suction unit	○●
	Delivery bed	○○○○
	Exa. light	○●
	Oxygen reg.	○
	Wheel chair	○
	Stretcher	○
	Autoclave	○
	Incubator	●

○: available, △: broken, but available, ●: broken

Kisii DH

Section	Equipment	Condition
Laboratory	Centrifuge for haem	○
	Colorimeter	○
	Shaker	○
	Centrifuge	○○
	Screening unit	○○
	Blood cell counter	●
	Refrigerator	○○○○
	Water bath	○
	Incubator	○
	Distiller	○
	Microscope	△
MCH clinic	Scale	○○○
	B.P. machine	●
	Sterilizer	○
	Heater	○
Outpatient clinic	Film viewer	●
	Heater	○
ENT clinic	Head light	○
	Stethoscope	○
	Sterilizer	○
	Exam. light	○
Eye clinic	Microscope	○
	B.P. machine	○
	Stethoscope	○
	Oper. microscope	●
	Oper. light	●
	Sterilizer	○
Physiotherapy	Microwave unit	○●●●
	Ultrasound unit	●●
	Infrared light	●●
	Walking machine	●●
	Wax bath	●
	Interferential unit	●
	Cradle heater	○
	Stimulator	●●

Section	Equipment	Condition
Theatre for VSC	Sterilizer	△
	Scale	○
Theatre	Oper. table	△△
	Autoclave	○
	Sterilizer	○○
	Oper. light	○●●
	Stretcher	○○
	Anaestetic unit	○○
	Film viewer	●
	Suction unit	○
	Ambu bag	○○

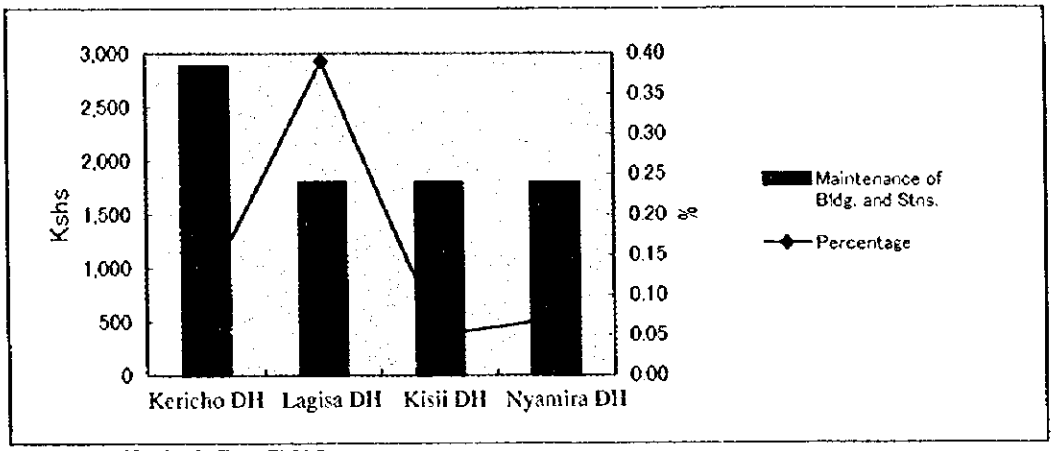
Section	Equipment	Condition
Physiotherapy	Thigh strengthen u	●
	Wheel chair	●●
	Bicycle	△
	Posture drain.bed	○
	Exerciser	○
	Parallel bar	○
	Film viewer	○
	Shortwave unit	●●
	Ultraviolet light	●●●
X-ray room	X-ray unit, general	●△
	X-ray unit, portable	●
	X-ray unit, dental	●●
	Drying cabinet	●
	Auto. processor	●
	Heater	●●
	Film viewer	●
Maternity	Scale	○●
	Baby incubator	○
	B.P. machine	●
	Suction unit	○
Female ward	Sterilizer	○○○
	Exam. light	○
Male ward	B.P. machine	●●
	Sterilizer	○
Dental	Dental chair	●
Entomology lab.	B.P. machine	○
	Microscope	○○○△●
	Centrifuge	○○
	Refrigerator	○●
	Incubator	○
	Autoclave	●
	Spitoon cabinet	△
Theatre for VSC	Film viewer	●
	Autoclave	○
	Oper. light	●

○: available, △: broken, but available,
●: broken

3.1.5 Maintenance system

(1) Budget for maintenance

One source of budget for maintenance is from of MOH which is recurrent every 3 months. The total amount of the budget appropriated for each hospital is reportedly as little as Kshs. 1,800-2,800 per 3 months per hospital. This maintenance budget is minimal, equivalent to only 0.11% in Kericho DH, 0.39% in Longisa DH, 0.07% in Nyamira DH, and 0.05% in Kisii DH, on average less than **0.1%** of the total budget for each hospital. For comparison, Tenwek Mission Hospital allocates about **11%** of its total budget for maintenance.



Source: JICA Study Team Field Survey

Fig. 3- 9 Maintenance budget and its ratio at each hospital

The other source of funds may come from part of the **FIF** (Facility Improvement Fund) collected by the "cost-sharing system". Out of the total FIF 75% is allocated for expenditures on the operation and management of Hospitals, the rest of **25%** is for the purpose of maintenance. In case of the Nyamira Hospital, the study team was informed that the amount appropriated for maintenance is only approximately Kshs. 64,000 per year, or Kshs. 5,300 per month.

(2) Maintenance Unit and Staff

Each hospital has a Hospital Maintenance Unit (HMU), however there are only few artisans and carpenters to carry out maintenance work. For any task other than very minor repair work, an engineer from MPW is called for a consultation prior to carrying out repair work.

Table 3-5: The number of Maintenance staff in DH

	Keicho DH	Longisa DH	Nyamira DH	Kisii DH
No. of Maintenance Staff	1 Technologist 6 Technicians	3 Technicians 2 PHO 1 PHT	2 Technologists 2 Technicians 1 Carpenter 1 Support staff	2 Technologist 5 Technicians 6 Artisans 1 Mech. Eng. for Vehicles 1 Support staff

Source: JICA Study Team Field Survey

The maintenance work carried out by HMU is biased to the maintenance of medical equipment. Table 3-9 shows the number of staff available for maintenance work in each hospital. Water system problems are a regular feature, for which staff need special training in plumbing in order to be able to carry out effective repair works. Nyamira DH has a more complicated water supply system than Kisii and Kericho DH, and has many water system problems. Staff training in plumbing repair works will be required for Longisa DH before it starts full operations.