JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF HEALTH
THE REPUBLIC OF KENYA

BASIC DESIGN STUDY REPORT
ON
THE PROJECT
FOR
THE IMPROVEMENT OF THE EQUIPMENT
FOR
THE KENYATTA NATIONAL HOSPITAL
IN
THE REPUBLIC OF KENYA

SEPTEMBER 1992

BINKO LTD.

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PREFACE

In response to a request from the Government of the Republic of Kenya, the Government of Japan decided to conduct a basic design study on the Project for the Improvement of the Equipment for the Kenyatta National Hospital and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Kenya a study team headed by M.D. Katsuhiro Yoshitake, Department of International Cooperation, National Medical Center Hospital, Ministry of Health and Welfare and constituted by members of Binko Ltd., from 3 April 1992 to 2 May 1992.

The team held discussions with the officials concerned of the Government of the Kenya, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to the Kenya in order to discuss a draft report and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Kenya for their close cooperation extended to the teams.

September 1992

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

September 1992

Mr. Kensuke Yanagiya,
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

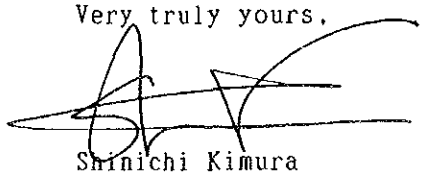
We are pleased to submit to you the basic design study report on the Project for the Improvement of the Equipment for the Kenyatta National Hospital in the Republic of Kenya.

This study has been made by Binko Ltd., based on a contract with JICA, from 27 March 1992 to 16 September 1992. Throughout the study, we have taken into full consideration of the present situation in the Republic of Kenya, and have planned the most appropriate project in the scheme of Japan's grant aid.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, the Ministry of Foreign Affairs, the Ministry of Health and Welfare and Embassy of the Republic of Kenya in Japan. We also wish to express our deep gratitude to the officials concerned of the Ministry of Health of the Kenya, JICA Office in the Kenya and Embassy of Japan in the Kenya for their close cooperation and assistance during our study.

At last, we hope that this report will be effectively used for the promotion of the project.

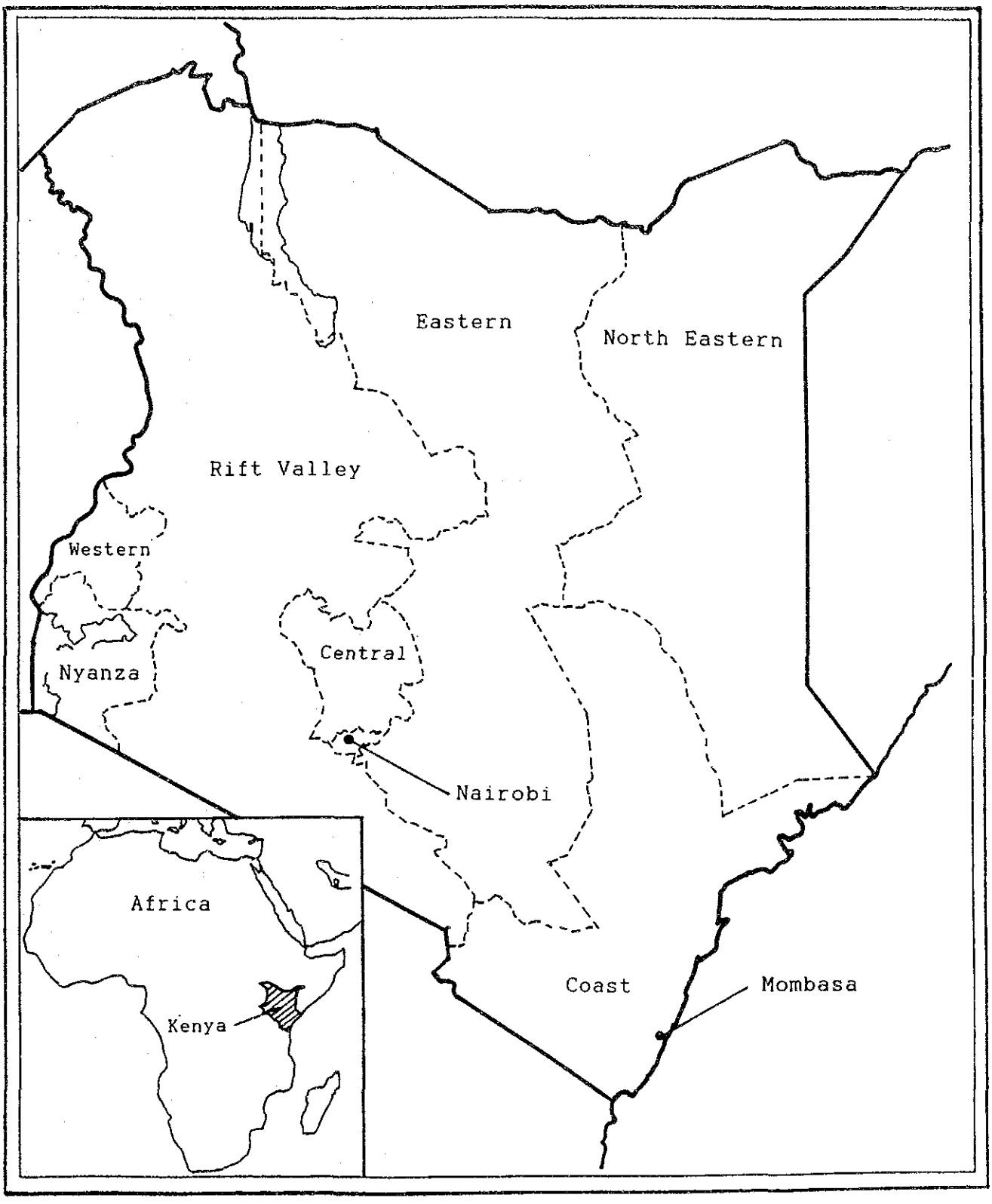
Very truly yours,

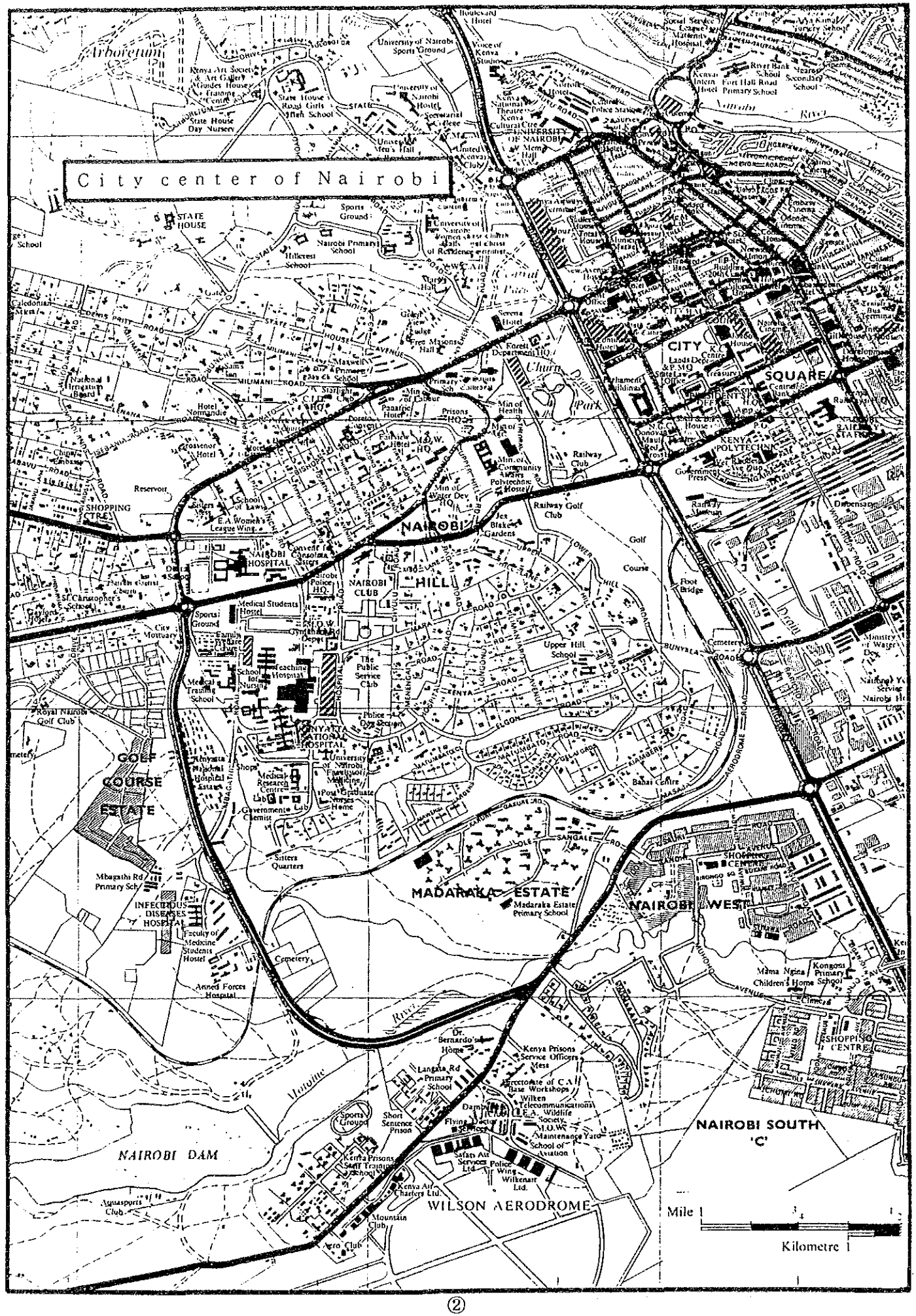


Shinichi Kimura
Team Leader
Basic design study team on the Project for the Improvement of Equipment for Kenyatta National Hospital

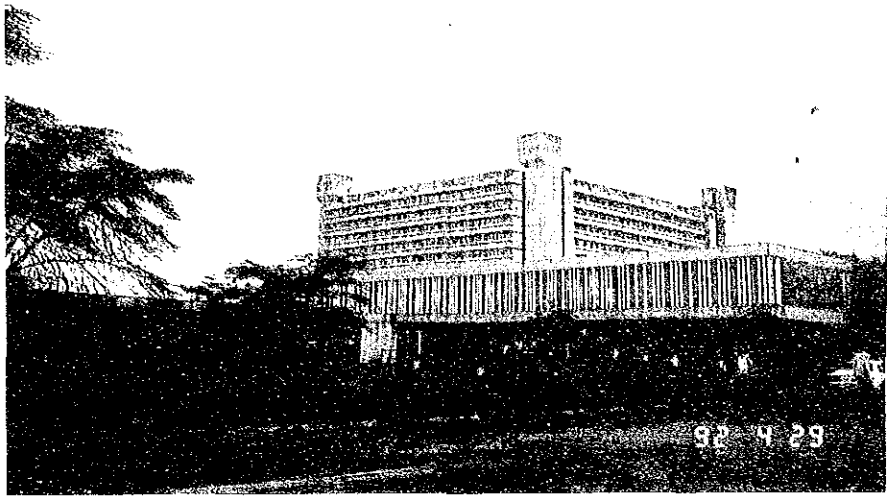
Binko Ltd.

Republic of kenya

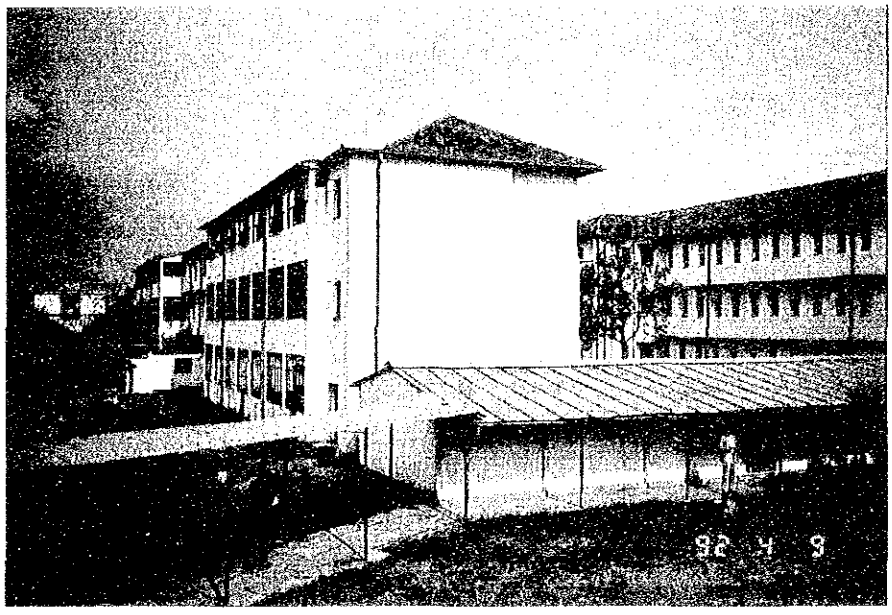



City center of Nairobi
Arboretum
CITY SQUARE
NAIROBI HILL
NAIROBI
GOLF COURSE ESTATE
MADARAKA ESTATE
NAIROBI WEST
NAIROBI SOUTH 'C'
NAIROBI DAM
WILSON AERODROME
Mile 1
Kilometre 1

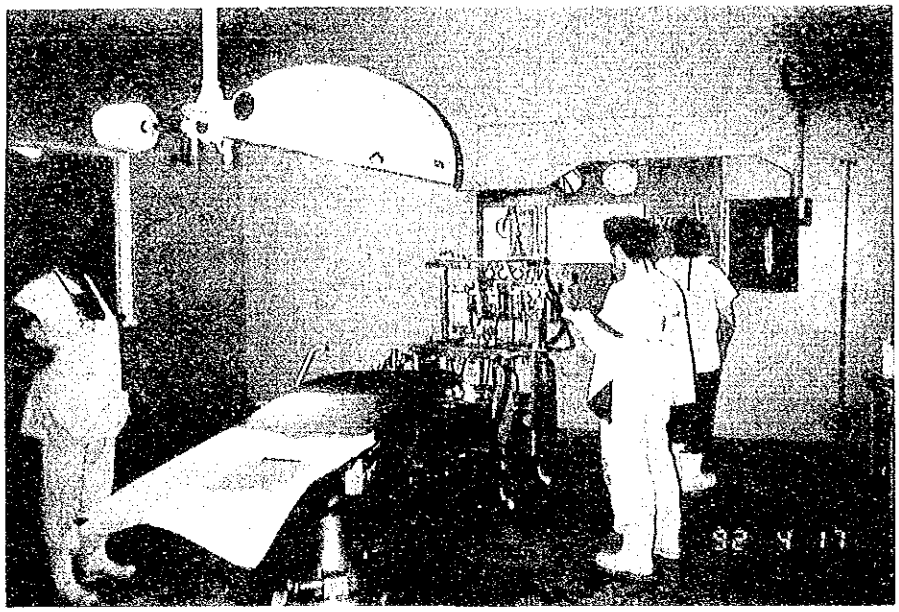
KNH complete
view



KNH
King George ward



Operation theater



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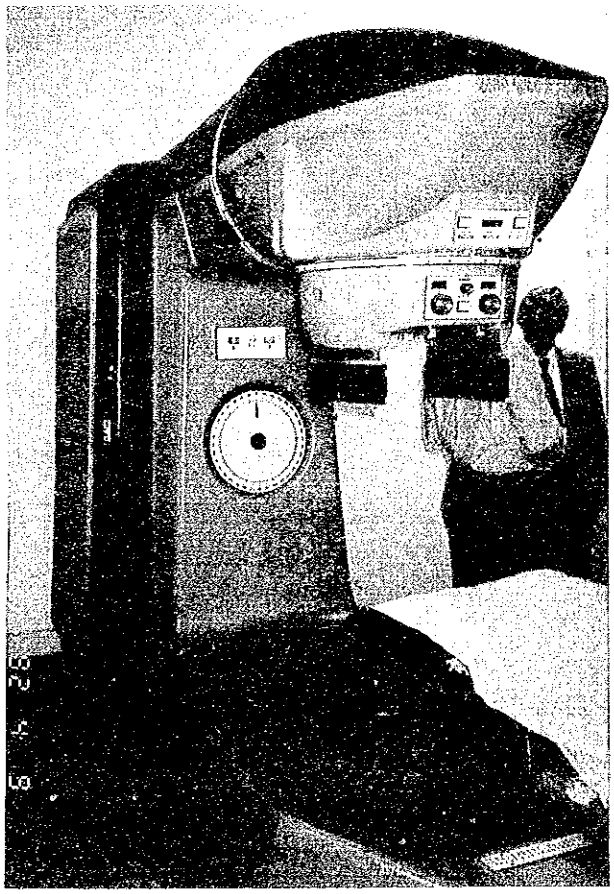

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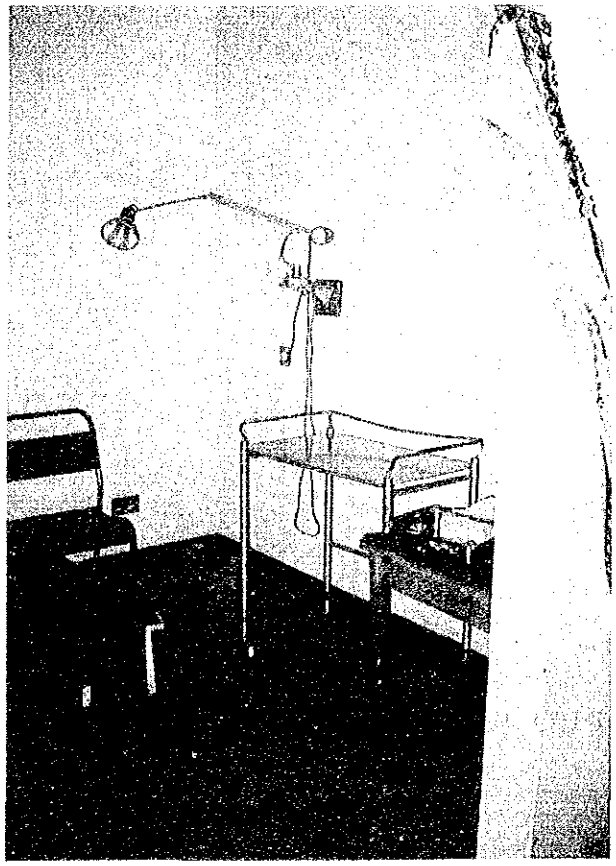
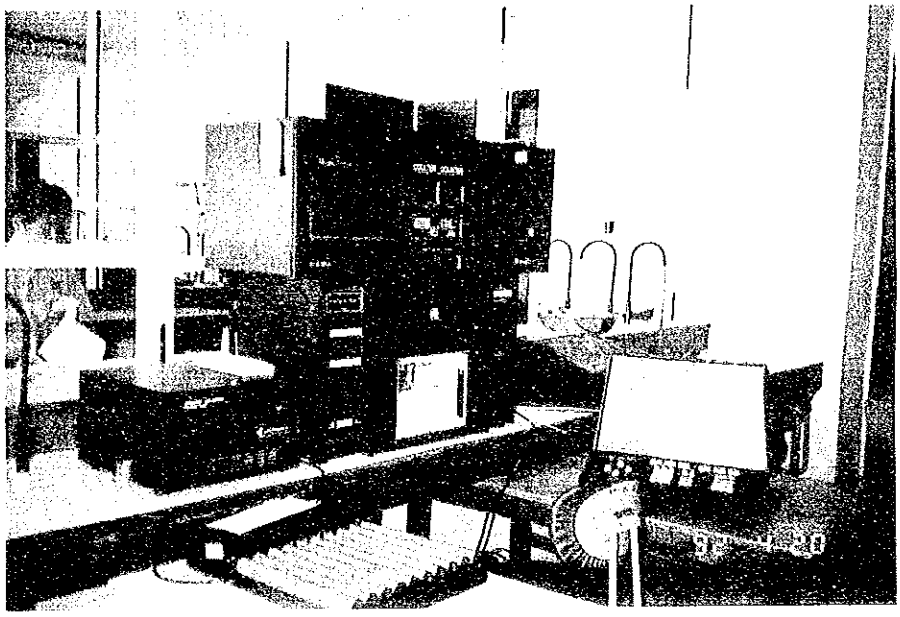
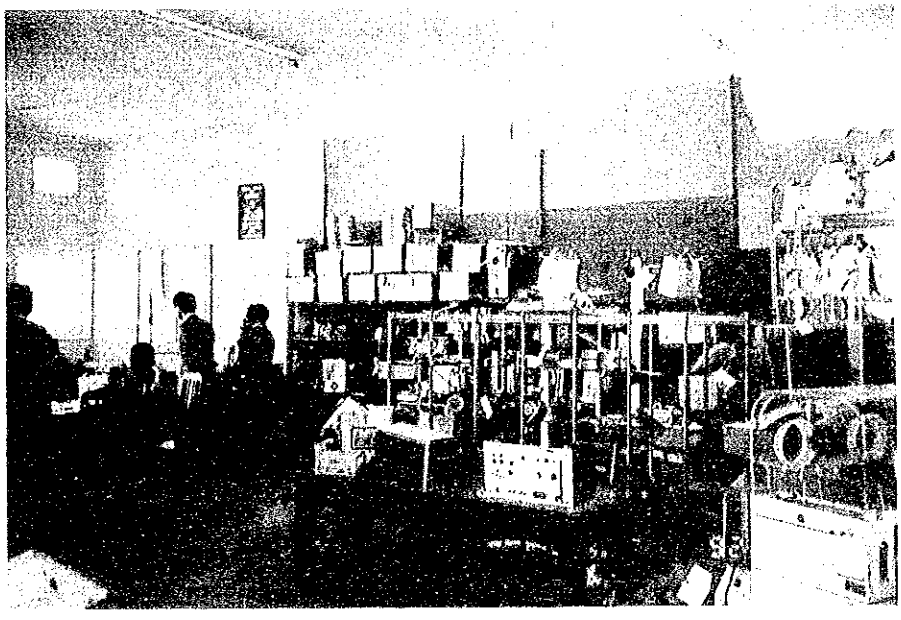


Laboratory

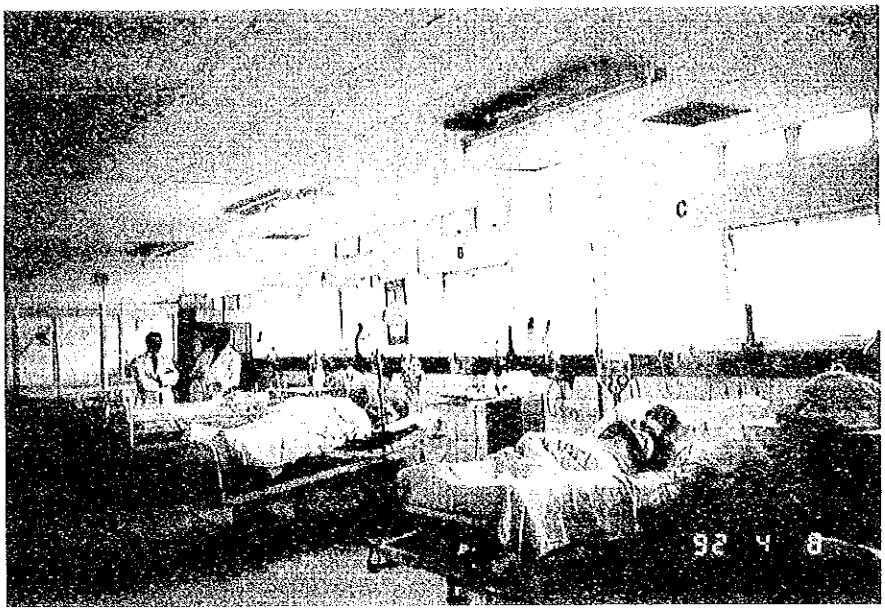


C.S.S.D

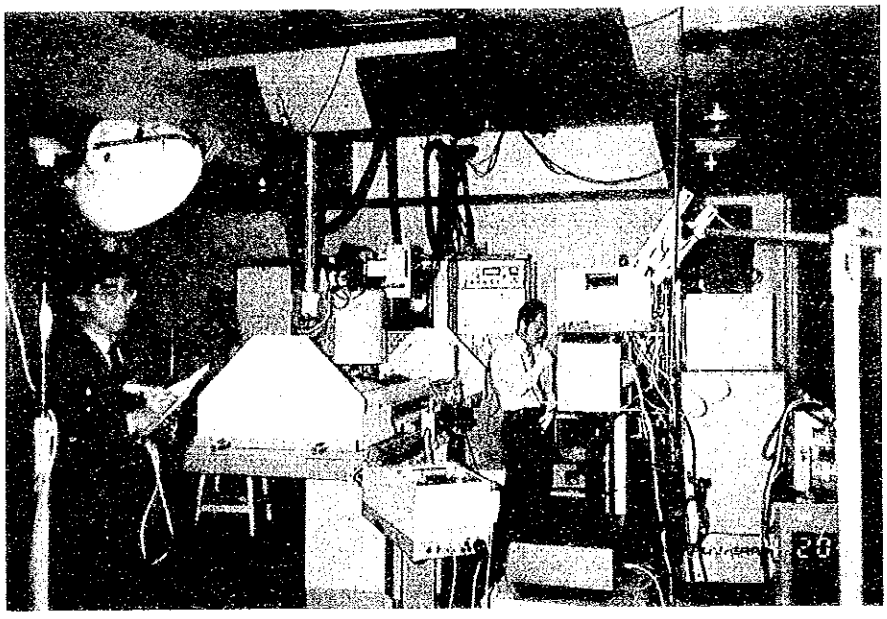
Biomedical
Engineering



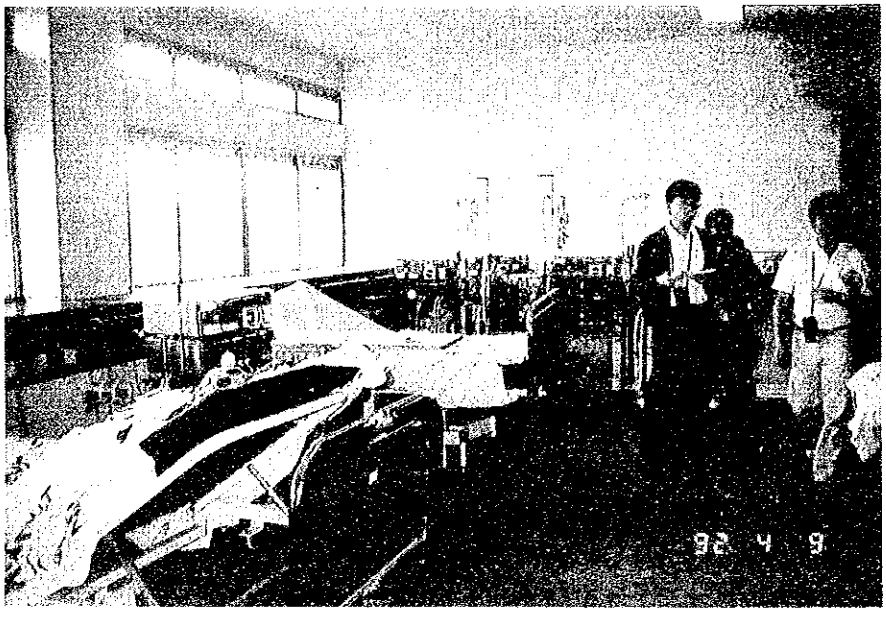
I.C.U.



E.C.G./Cardiology



Renal



Summary

The government of the Republic of Kenya has been making continued efforts to upgrade and improve health care since its independence in December 1963. The results achieved are not necessarily satisfactory. The Republic of Kenya is still a typical developing country in terms of the indices of health care affairs: 47 births/1,000 persons, 10 deaths/1,000 persons, 64 infant deaths/1,000 births, an average life expectancy of 61 years at the time of birth, 13.9 doctors/100,000 persons, 104.3 nurses/100,000 persons, 182 medical institutions in the country, 141 hospital beds/100,000 persons. While the indices are slightly better than those in average African countries, the situation is no better than that in South East Asia. Thus, urgent measures are required to encourage the training of health care workers, to promote education in medicine and health science, and to provide better medical facilities and equipment.

Kenya's morbidity pattern shows that infectious diseases are the major cause of morbidity in the country. Diseases that have been conquered and practically eradicated in developed nations, as well as tropical infectious disease, account for a large part of the morbidity breakdown. Apart from these diseases Kenya has also revealed an increasing tendency in the occurrence of heart diseases, malignant tumors, and other diseases typical of modern society. Infant mortality rate is high because of poor public hygiene and the prevalence of diseases caused by malnutrition.

The sixth national five-year plan states that a goal of the plan is the encouragement of national welfare together with the development of agriculture and resources. To improve health services, the five-year plan embraces the following main policy objectives in the area of health service: ①eradication and prevention of diseases; ②provision of suitable and effective therapeutic services for the entire nation; and ③improvement in research on medical services. For this sake, concrete medical programs have been implemented in: ①securing funds for medical services, ②establishing a health insurance system, ③securing the staff required for health services, ④upgrading the primary health care services, ⑤improving preventive and therapeutic services, ⑥improving environment of general health conditions

through the establishment of public health and food hygiene systems, etc.

About 70% of Kenyan work force are engaged in agriculture. The economy in Kenya depends largely on foreign currency earning by the exportation of agricultural products such as coffee and tea etc.. These agricultural products, however, are apt to be influenced by international market. Therefore balance of payment is always under unstabilized condition. Such being the case, while the rate of economic growth fell down around 1.6%, consumer price index was 13.6% (1987). With the per-capita gross national product of Kenya was $380, which was ranked low among the countries even in Africa. Trade deficit has been accumulating since 1985, amounting to about 1.2 billion Kenya pounds in 1989. The tightness of the national economy has been impeding the promotion of medical policies described above.

The Kenyatta National Hospital (KNH), located in the center of Kenya's capital city, Nairobi, is the country's largest public medical institution equipped with approximately 2,000 beds and approximately 150 doctors. While functioning as a nationally-operated general hospital, it also plays a major role as the largest provincial hospital servicing the metropolitan area of Nairobi and as a teaching hospital for the Nairobi University, School of Medicine and Medical Training College. Due to severe financial constraints in recent years, the hospital has not been able to conduct the maintenance of its facilities and replace old equipment to a satisfactory level. Because of superannuation of the facilities and the low performances and the shortage of equipment, the hospital is currently not able to provide adequate medical services.

The government of Kenya therefore made a commitment, in 1987 on the basis of USAID cooperation, to a reconstruction plan designed to reinforce the service capability of the KNH as the nation's leading medical institution. In 1989, it drafted the "Master Plan for the Rehabilitation Program of the KNH." Among this Master Plan, the government established its "Five-Year Plan for KNH Rehabilitation Project", a plan aimed at achieving a sound financial basis for the hospital, upgrading the administrative system, refurbishing the Medical Service System, rehabilitating the facilities, and

improving the medical equipment by way of obtaining the cooperation of the World Bank (WB). Under this plan, a "Rehabilitation Project" has been carried out since 1991 on the basis of the WB's cooperation. In implementing this Five-year Rehabilitation Project, the government of Kenya requested government of Japan to extend Japan's grant aid for procurement of urgently needed diagnostic and therapeutic equipment, which the KNH unable to purchase with its own effort. In the background of this request was the fact that the government of Japan had dispatched a team of experts, for the duration of five years from 1970, to assist the opening of the Intensive Care Unit and the Heart Surgery Department of the hospital.

In response to the request made by the government of Kenya, the government of Japan decided to carry out a study on this project. In September, 1991, a Preliminary Study team was sent to Kenya by the Japan International Cooperation Agency (JICA) and undertook survey and discussion concerning the background of this project and the details of its contents. As a result of the study, JICA reached the conclusion that it was necessary to conduct a basic design study for the requested grant aid, and the Basic Design Study Team was dispatched to Kenya in April, 1992. Bearing in mind the outcome of the preliminary study, the Basic Design Study Team had a series of discussion with the Kenyan authorities concerned and collected data and documents related to the Project. After subsequent detailed analysis in Japan, a draft report was presented to the Kenyan side in August, 1992. The Basic Design Study Report presented herewith has been compiled based on these activities.

In this study, a Basic Design was determined based on the objectives of the project, budgetary provisions, operation and maintenance systems, and the effectiveness of the Project. It was decided that the Basic Design should adhere to the following policies:

1) The major problem in the medical services of the KNH lies in the malfunction of existing equipment due to superannuation and the shortage of the equipment. The Basic Design should be developed on the basis of the recognition that the hospital is a nationally-operated general hospital providing a full range of services from primary care to the most

advanced medical services available in Kenya. The selection of equipment should be appropriate for the activities of the hospital. Specifically, it should be based on a detailed analysis of current morbidity patterns at the hospital, the size of the case load, and the present level of existing equipment. It should also be ensured that the procured equipment can be operated, maintained, and managed with the existing level of technical competence and within the budgetary limits. At the same time, the execution schedule of the World Bank's Rehabilitation Project should be taken into account carefully in relation to the execution of the Project. As for items requiring installation works the selection of equipment should be made on condition that the reforming of the place of installation can be prepared before the delivery of equipment procured under this project.

2) In view of the ease and reliability of maintenance after procurement, as well as the relationship with the existing equipment, it should be taken into consideration that a part of the equipment may be procured from third-party countries and the equipment of which spare parts, consumables and maintenance service is available in Kenya or neighboring countries may be also procured. Large and advanced medical equipment requiring installation works should be subjected to pre-delivery installation tests at the manufacturer's factory, so that rapid and reliable installation works can be ensured.

3) From the technical viewpoint, the equipment to be procured should be easy to operate and suitable to be used with the existing technical skills of medical personnel. The equipment should be relatively simple in structure, not prone to breakdown, and resistant to the unstable power supply conditions in Kenya, as well as the hot and humid tropical climate. Furthermore, in order that the equipment can be maintained by the Kenyan side, spare parts should be supplied in adequate quantities and suitable technical training for the maintenance should be given at the time of delivery of the equipment. The present project covers a total of ten hospital divisions, including the Radiation Therapy and Laboratory Divisions, which are in need of urgent improvement. The

followings are the main items of the equipment which have been selected on the basis of the above considerations:

Designed Equipment by Division

Division	Main Equipment List
Radiation Therapy	Cobalt 60 radiation unit, X-ray simulator, Superficial X-ray simulator, Intracravity machine remote after loading, Treatment planning system, Anesthesia machine, Operating table, Suction unit portable, Diagnostic set, Others
Laboratory	Clinical chemistry analyzer, Refrigerated centrifuge, Protein electrophoresis, Deep freezer, Incubator, Spectrophotometer, Tissue embedding system, Electronic blood counter, Water distiller, Auto stainer, Microtome rotary, CO_2 incubator, Analyzer for sodium & potassium, Blood gas Analyzer, Incubator, Others
Operating Theaters	Electro-surgical unit, Operating microscope, Cardiac monitors, Fiberscope, Cryo machine for eye surgery, Pace makers, Laparoscope, Operating table, Operating room lamp, Others
I.C.U.	Bed-side monitors, Respirators, Respirators pediatric, ICU incubators, Non-invasive blood pressure monitor, Others
E.C.G./Cardiology	Angiocardiography system, E.C.G., Stethoscope, X-ray protective aprons, pacemaker, Ultrasonic scanner, Others
Renal	Hemodialysis machine, Ultrasonic scanner, bedside cabinet, sphygmomanometer, Defibrillator, Patient trolley, Peritoneal dialysis cyclers, Others
Bio-medical engineering	Oscilloscope, Synthesizer, Paging system, Welding machine, Drill, Light source, Spot welding machine, Others
T.S.S.U.	Ultrasonic instrument washer, Surgical glove powdering machine, Drying cabinets, Manual sewing machines, Others
C.S.S.D.	Drying cabinets, Ultrasonic instrument washer, Surgical glove powdering machine, Others
Casualty	Defibrillator, Bedside monitors, Operating table, Patient card imprinting, Instrument sterilizer, Anesthesia machine, Portable X-ray film illuminator, Others
Total 10 divisions	

The project is implemented by the Ministry of Health of Kenya, and the Head of the KNH will assume the overall operational responsibility for the execution of this project. The Biomedical Engineering Services of KNH will handle all maintenance and management of the equipment after procurement.

Whenever possible, the equipment has been selected so that it can be serviced by the Biomedical Engineering Services of the hospital in its present form. If servicing by the Kenyan personnel is impossible, it will be available from the local dealer of the equipment manufacturer. Although the Biomedical Engineering Services is unequipped or inadequate in many respects in terms of its organizational, system, and budgetary constraints, this problem will be resolved after the reorganization of the maintenance system, which is currently promoted under the World Bank's Rehabilitation Project. In addition, it has been agreed that the World Bank personnel in charge of the Rehabilitation Project who will stay in Kenya will take charge of the maintenance of the equipment procured under this project, as well as those procured under the World Bank's project. Thus, it is considered that there will be no problem concerning the maintenance system.

No special expense will be required on the Kenyan side, because the project is implemented at a site where the supply of electricity, water, and other services has been completed. Although the annual maintenance costs needed after the implementation of this project will be about 9,548 million Kenya shillings, these costs consist of electricity charges, water and sewerage rates, costs of medical gases, costs of consumables, and other daily expenses. Furthermore, most of the equipment procured under the project is either intended to replace the existing superannuated equipment or intended to replenish equipment which has recently broken down irreparably and is out of order. Because of these reasons, it is considered that the maintenance costs needed after the implementation of the project will be within the limit that can be covered by the current budgetary arrangement. However, after the expiration of the one-year warranty provided by the manufacturer, the Kenyan side must bear the annual cost of about Khs 7,400 million for the maintenance contracts covering advanced medical equipment which will need continued maintenance.

The project is estimated to require 11.5 months until completion after the Exchange of Notes.

The implementation of this project is designed to restore the capabilities of the KNH so that it will be able to function as the nation's most advanced medical institution and teaching/training organization, providing medical services of the higher level. The project is expected to have a major effect in terms of the medical services provided by the country's health administration and in the area of medical education with respect to the training of medical staff. In more specific terms, the upgrading of the hospital facilities under the present project will afford an ideal opportunity for the 1.427 million inhabitants living in and around Nairobi, that is, a about 6 percent of Kenya's entire population, to be in the favorable position of having medical services of high quality standard at their disposal. The project, when implemented, will also indirectly enable the 23 million total population of Kenya to have recourses to a high-level and fully adequate medical service offered by the comprehensive facilities of the Kenyatta National Hospital. The project, when completed, also provides the 3,000 or more students in the course of medical education at institutions such as Nairobi University, School of Medicine with the opportunity to use the latest and most advanced medical equipment and apparatuses for their study. This is considered to be of major importance in assisting and promoting medical training in Kenya. On the other hand, the installation of additional equipment will help widen the scope of health care provided at the hospital and increase the capacity of the hospital to accept paid patients. As the result, it is expected that the revenue will be increased and the financial status of the hospital management will be improved.

Based on the above examination, it is considered that the project is appropriate to be implemented under the grant aid of Japan, in view of the extent of the effectiveness of this project and the feasibility of the operation and management of the project.

In order to enhance the effectiveness of this project, it is recommended for the Kenyan side and the Japanese side to take the following actions:

1) A part of the equipment planned to be procured under this project includes equipment for advanced therapies. Most of the consumables for such equipment must be imported from overseas countries, and some of such equipment will need a maintenance service contract with the manufacture to cover maintenance and periodic inspection. Furthermore, increase of patients in the future and further expansion and enrichment of health care activities will increase operational expenses. It is recommended for the Kenyan side to establish necessary system or organization and to introduce appropriate budgetary measures.

2) In order to enable more effective use of the equipment procured under this project, it is recommended that Japanese experts in guidance of maintenance should be sent to the project site. In order to induce the self-help effort of the Kenyan people concerning the maintenance of equipment, it is desired that the personnel of KNH in charge of the maintenance of medical equipment should be invited to Japan to promote technology transfer in the maintenance and repair of medical equipment.

CONTENTS

List of Figures and Tables

Chapter 1 Introduction

Chapter 1 Introduction

The Kenyatta National Hospital is the leading medical institution in the Republic of Kenya. It offers and is expected to offer advanced medical services. The Hospital is located in the center of Nairobi City. As a comprehensive national hospital, it commands an apical position in the Kenyan medical establishment as the top hospital for the patients from the medical institutions placed under it. As a provincial hospital servicing the Nairobi metropolitan area, its service activities offer basic medical care from the primary to tertiary medical service levels. As a medical facility endowed and equipped with the latest medical technology capabilities, the Kenyatta National Hospital also plays an important role as a teaching hospital for the training of medical staff and personnel, including the training of medical students from the School of Medicine of Nairobi University, nurses, and paramedics. Japan has achieved a record of satisfactory results in its technical cooperation with the assignment of a Japanese medical experts which had been stationed in Kenya for five years since 1970 in connection with the opening of an Intensive Care Unit and a Cardiac Surgery Department at the Kenyatta National Hospital. For the last few years, however, the Hospital has experienced great difficulty in providing adequate medical services due to the obsolescence of the facilities and equipment at the hospital, seeing that under the existing financial constraints it has not been possible to upgrade the facilities and renew or supplement equipment to a satisfactory extent.

Under these conditions, the government of Kenya made a commitment, in 1987, to the rehabilitation of the Kenyatta National Hospital on the basis of USAID cooperation. In 1989, it drew up the Master Plan for the Refurbishing and Upgrading of the Kenyatta National Hospital and after this established the Five-Year Plan for the Rehabilitation of the Kenyatta National Hospital by enlisting the cooperation of the World Bank. The objective of this Plan was to reinforce the performance capability of the Kenyatta National Hospital to function as a comprehensive national hospital, with the ultimate target being to achieve the ambition expressed in the WHO slogan "Health for All Nations by the Year 2000". As for the hospital building and the electrical equipment and the pipework, the above plan of the World Bank is scheduled to compelete the rehabilitation of those in

fiscal year 1991-1992. In view of the conditions as they are, the Government authorities of Kenya requested a Japan's grant aid for the procurement of equipment in urgent need of upgrading, as part of the medical equipment which are not available to procure by Kenyan themselves.

In response to this request, the government of Japan decided to conduct a basic design study and the Japan International Cooperation Agency dispatched a study team for this Project to the Kenya for 30 days from 3 April to 2 May, 1992. The Basic Design Study Team led by Dr. Katsuhiro Yoshitake doctor in Department of International Cooperation, National Medical Center Hospital. The Basic Design Study Team carried its ivestigations on the current situation by checking and conferring with Kenyan officials about the background details of the plan and the contents of the request for the confirmation of project implementation. Explanations were given to the Kenyan officials about the system and the procedures for the grant aid system of the government of Japan. In the course of these discussions, it was also confirmed the matters to be undertaken respectively by the Japanese and Kenyan governments when the Project should be executed. On the basis of the results obtained from this field study, a detailed analysis of the project was made to determine its feasibility and justifiability and to examine its contents. A draft final report was thus prepared to lay down the suitable framework for the execution of this Project, including the basic design for the medical equipment, the calculations of the overall project costs, and a maintenance and management plan. Following the preparation of this draft report, a explanation team was sent to Kenya again under the leadership of Dr. Katsuhiro Yoshitake of the National Medical Center Hospital to explain and comment on the draft report for 11 days from August 4 through August 14, 1992. As the result, the basic design study report has been compiled. The Appendix Materials give details of the Schedules for the study and explanation team, the members list of the both teams, and the minutes of the discussion.

Chapter 2 Background of the Project

Chapter 2 Background of the Project

2.1 Outline of the Republic of Kenya

2.1.1 General Description of Kenya

Kenya gained independence from the United Kingdom in 1963. The country's post-independence history has been founded on two policy principles: the upholding of a free market economy and friendly diplomatic relations with the West. The political system is that of a constitutional republic. Its parliamentary system consists only of one chamber, the National Assembly comprising 170 deputies, all of whom are required to be party members of the Kenya Africa National Union (KANU). The country's president is the leader of the KANU party D Arap Moi who has been in office since 1978.

Geophysially, Kenya is the hinterland of the Indian Ocean and occupies a geographically very important position in the eastern part of central Africa. Kenya has a land surface area of 580,367 square kilometers (1.54 times as Japan). It borders on Ethiopia and the Sudan in the north and adjoins Uganda and Rwanda in the west. In the south, it flanks on Tanzania and in the East it borders on Somalia and the Indian ocean.

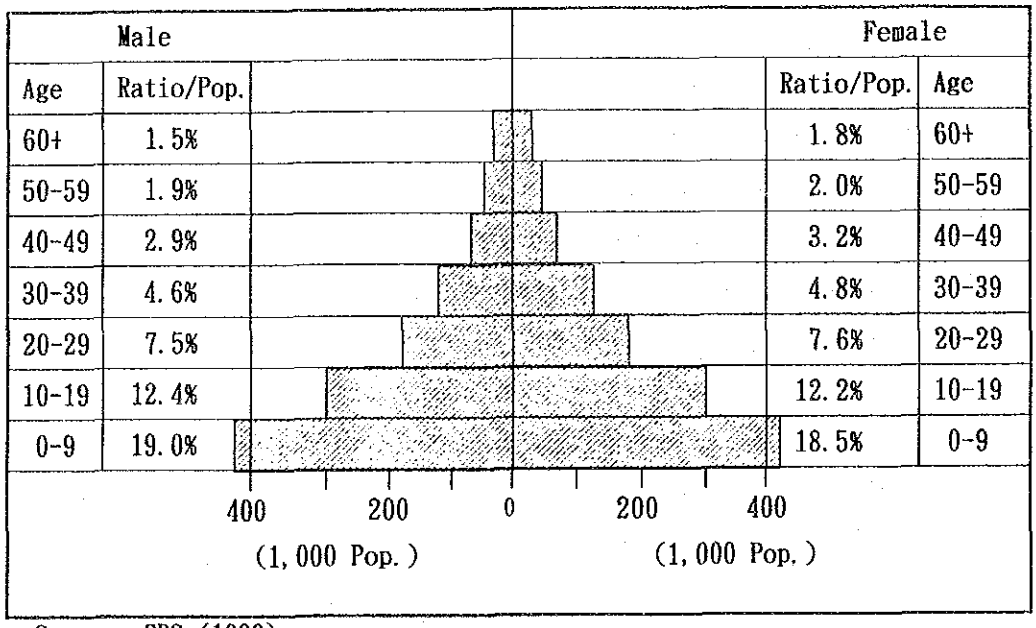
There are two rainy seasons, one from March to June is the Major Rainy Season and the other from October through November is the Minor Rainy Season. Extensive rainfall is recorded around the shoreline of the Indian Ocean and the surround mountain plains near the Indian Ocean and in the western parts of the country. The other provinces of the country, especially those situate in the continental lowland belt below 1,000 meters above sea level and the north eastern part of the country, have extremely little rainfall.

2.1.2 Population

Fig. 2-1 shows Kenya's population composition. It is clear that the infant population (ages from 0 to 15) exceeds the productive working population (ages from 16 to 65) by a substantial margin, a population

profile very characteristics of a developing country. This shows that the productive population has to support a large dependent sector of the population.

Figure 2-1 Population Pyramid



Source: CBS (1989)

The population statistics for the year 1989 give Kenya's total population as 23.90 million. In terms of the nation's population density, there is a wide gap between the cities and the provinces. Nairobi, the capital of Kenya, has a high population density of 2,089 people/square kilometer and so has Mombasa at 2,461 people/square kilometer. The population density for the country as a whole stands at an average of 41 people/square kilometer. The urban population accounts for a share of approximately 18.3 percent (as of 1989) of the nation's total population. The rate of population growth was 3.8 percent in the period from 1980 through 1988. Fig. 2-2 shows the variation in Kenya population from 1948 through 2000 and Table 2-1 gives the population distribution by province (as of 1989).

Figure 2－2 Trend In Population Size By Year

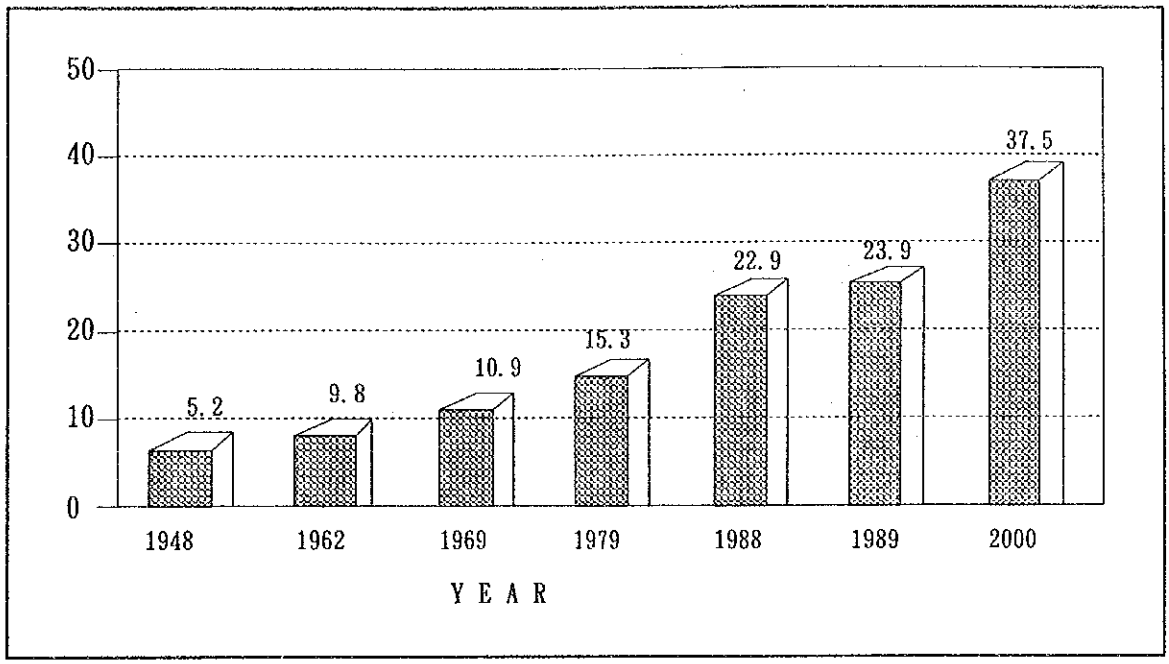


Table 2－1 Population and Density of Pop. at Every Province

Province name	Pop. (1,000pop.)	Area (Km^2)	Density of pop/Km^2
Nairobi Metropolitan	1,429	684	2,089
Central	3,550	13,173	269
Coast	2,065	83,040	24
Eastern	4,193	155,760	26
North Eastern	612	126,902	4
Nyanza	4,174	12,526	333
Rift Valley	5,128	171,108	29
Western	2,732	8,223	332
Total	23,883	571,416	41

Source:「Statistical Abstract 1989」

2.1.3 National Development Plan

In March 1989, the government of Kenya announced its (1989 - 93) Sixth Five-Year Development Plan. The basic underlying concept of this Plan is that of a "participation in development," based on the fact that Kenya has so far been in the process of development and is still a

developing country. The present Five-Year Development Plan corresponds to the first medium-term economic plan of the Economic Management for New Growth in April 1986, a policy envisaging a long-term structural adjustment in anticipation of a result of the year 2000. It is thus seen as the first step towards the achievement of a long-term vision.

The Sixth Five-Year National Development Plan has the following main targets:

① Achievement of a rate of economic growth (5,4% a year) consistent with the country's high rate of population growth.
② Creating employment opportunities
③ Securing food resources
④ Balanced development between the cities and villages
⑤ Economic growth through increased agricultural production and the propulsion of industrialization policies
⑥ Streamlining of the government budgets to ensure a more efficient distribution of the country's scarce resources and attaching great importance to the private sector.

2.1.4 Economics and Finance

Kenya shows that agriculture is the nation's basis. Agriculture and the activities related to agricultural production employ 79 percent of the country's total working force, and their output commands an approximately 30 percent share in Kenya's Gross Domestic Product (GDP). Some 20 percent of Kenya's total wage-earning working population is employed in the agriculture, and agricultural products account for 60 percent of total exports. In recent years, the government has energetically pursued industrial development programs , but industrial growth is still at a low rate of less than 1 percent per year. The basic structure of Kenya's agriculture-dependent economy has not changed so far, with the manufacturing sector contributing only 13.1 percent to the GDP in 1989.

Table 2－2 GDP Standard by Industry (1982 price)

(unit : million lbs)

	1986	1987	1988	1989	1990※
Substial GDP (1982 price)	3,498	3,668	3,859	4,050	4,233
Percentage increse since previous year (%)	5.5	4.9	5.2	5.0	4.5
＜Monetary economy＞	3,296	3,460	3,644	3,827	4,004
Agriculture	1,062	1,108	1,159	1,207(30%)	1,248
Manufacturing industry	449	474	503	532(13%)	560
Construction industry	112	117	122	128(3%)	135
Tourist industry	390	413	436	455(11%)	474
Transportation･Communications	215	225	234	241(6%)	250
Finance･Immovables	261	275	291	313(8%)	333
Housing possession	197	206	212	221(5%)	229
Other services	81	88	101	112(3%)	128
Government services	529	554	586	618(15%)	647
＜Non monetary economy＞	202	09	215	223(6%)	230

Source : 「Economic Survey 1991」 ※ 1990＝Provisional value

The economic trends can be seen from Table 2-3 showing the growth pattern of Kenya's Gross Domestic Product (GDP). As can be seen, the average rate of growth of the nation's GDP stood at a high 6.5 percent during the period from 1964 - 72, and slowed down somewhat to 5.1 percent during 1972 - 79. These figures are evidence of a steady rate of development sustained at a very high level from the time of national independence until the end of the 1970s. Exports were mainly supported by such agricultural products as coffee and tea, accounting for a third of all exports. These items are susceptible to international market influences. At the beginning of the 1980s, the international market for these products slumped, pulling down with it the Kenyan economy.

Table 2－3 Trends in GDP

(Unit : %)

	Agriculture	Industries	Government services	Others	Total
1964～71※	4.2	8.2	9.8	6.9	6.5
1972～79※	4.8	10.2	7.3	4.1	5.1
1980	0.9	5.2	5.6	5.2	3.9
1981	6.1	3.6	5.3	6.9	6.0
1982	11.2	2.2	3.8	1.4	4.8
1983	1.6	4.5	4.2	1.5	2.3
1984	△3.9	4.3	2.9	2.7	0.8
1985	3.7	4.5	4.2	1.5	4.8
1986	4.9	5.8	6.3	5.4	5.5
1987	3.8	5.7	5.7	4.9	4.8

※ Calculated by 1964 price from 1964 to 1971.
Calculated by 1982 price since 1972.
Source : National Development Plan

The international balance of payments (Table 2-4) has shown a continuous trend of deficit since 1985. To mitigate the trade deficit, Kenya has made efforts to expand tourism and transport to attract greater revenue from these sectors. Despite these endeavors, the nation's balance of payments has continued to show deficit since 1987. This has made the Kenyan government more dependent on foreign aid, thereby making the nation the typical pattern of a developing country in its international balance of payments with accumulated debts and repayment obligations.

Table 2－4 International Balance of Payment (1985～1990)

(Unit : million lbs)

	1985	1986	1987	1988	1989	1990 (provisional)
Ordinary balance	Δ76.7	Δ31.1	Δ406.6	Δ408.1	Δ604.2	Δ544.2
Trade balance	Δ273.5	Δ230.7	Δ587.4	Δ696.4	Δ1,067.0	Δ1,139.9
Tourism balance	192.0	228.3	272.1	328.9	404.5	489.4
Assistance balance	157.4	167.9	176.6	307.1	393.5	429.4
Capital balance	Δ22.0	102.2	307.2	344.6	681.4	373.6
Private－Long term	3.8	25.2	37.0	Δ1.6	70.8	26.3
Government－Long term	Δ20.3	3.8	162.3	256.4	389.6	105.1
Government Organ	Δ25.7	56.3	61.6	39.4	166.9	72.6
Short term	20.2	16.9	46.3	50.4	54.2	169.6
Error and omit	10.2	1.9	Δ4.9	4.3	3.3	1.6
Total balance	94.2	73.0	Δ104.4	Δ67.7	80.5	Δ168.9

Source : CBS「Economic Survey 1991」

Kenya's financial/fiscal policies have upheld the sound principle of financial management creating a surplus from a balance of trade remaining in a healthy surplus position throughout the 1970s since its independence. With the beginning of the 1980s, however, the agricultural produce, mainly for coffee and tea, slumped and stagnated. Since then, the government has been forced to pass austerity budgets in an endeavor to reduce ordinary expenditures. The deficit has been increasing year after year forcing extremely severe policies on the government to make up the deficit by borrowing from international aid organizations such as the IMF and the World Bank or with long-term loans from the aid organization of the industrialized nations or with domestic long and short-term borrowings. Table 2-5 gives the national budget for the period from 1988 through 1993. It can be seen that the attainment of the goals set forth in the Sixth Five-Year Plan effective from 1988 will be subject to a budget dependent on foreign aid.

Table 2-5 National Budget

(Unit : million lbs)

	1988/89	1989/90	1990/91	1991/92	1992/93prov.
Total revenue	1,824.9	2,099.5	2,357.7	2,626.7	2,927.9
Total expenditure	2,063.2	2,249.7	2,405.9	2,621.2	2,886.6
Ordinary expenditure	1,287.8	1,416.6	1,528.5	1,665.2	1,833.9
Development expenditure	775.4	833.1	877.4	955.9	1,052.7
Payment of consolidated public loan bonds	492.0	534.6	586.2	644.9	709.5
Foreign grant	367.4	327.0	280.0	280.0	290.0
Total budget defect	362.9	357.8	354.4	359.5	378.2
Source of defect covering					
Foreign long term debt	200.0	223.6	255.0	249.4	256.2
Domestic short and long term debt	162.9	134.2	99.4	110.1	122.0

Source : National Development Plan

2.1.5 Industry and Trade

Table 2-2 shows the structure of Kenya's industry. It can be seen that agriculture (including forestry) accounts for a third of the total economy. This is followed by the manufacturing industry, tourist service sector, finance, transport, communication, and the construction industry. Thus the primary industry sector (agriculture) has an

extremely large share, As can be seen from Table 2-6, the population employed in each of these sectors in 1989 currently stands at 19 percent of the total population for agriculture, 14 percent for the manufacturing industry, and 8 percent for the tourist industry. The breakdown between the population employed by the private and the population employed by the public sector is roughly equal.

Table 2－6 Employment Population by Industries

(unit : 1,000pop.)

	1987	1988	1989	1990※
Private sector				
Agriculture･Forestry	198.8	198.4	195.1	202.4
Mining	6.0	7.6	7.8	7.9
Manufacturing industry	138.2	141.7	141.8	146.1
Electricity･Waterworks	0.2	0.2	0.2	0.5
Construction industry	26.1	31.1	33.4	36.8
Wholesale and retail				
Restaurant･Hotel	97.1	98.3	101.4	104.6
Transportation･Communications	19.7	23.2	24.5	25.9
Finance･Insurance	41.6	44.2	45.3	47.1
Society･Individual service	130.3	137.7	137.7	142.5
Total	658.0	681.8	687.2	713.8
Public sector				
Agriculture･Forestry	54.2	66.7	66.7	65.1
Mining	0.5	0.6	0.6	0.7
Manufacturing industry	36.8	39.1	41.0	41.6
Electricity･Waterworks	19.0	20.2	22.2	21.5
Construction industry	32.1	32.6	35.3	34.6
Wholesale and retail				
Restaurant･Hotel	8.2	8.4	8.9	9.3
Transportation･Communications	44.7	50.4	51.3	48.3
Finance･Insurance	16.3	17.1	18.4	18.2
Society･Individual service	415.6	425.3	441.2	454.6
Total	627.4	660.4	685.6	693.9

Source : CBS「Economic Survey 1991」 ※Provisional

The balance of trade shows some slight changes from year to year, showing a chronic deficit position. This trend has practically remained unchanged since the independence. Exports are largely dependent mainly on products from the primary industry sector, with coffee, tea, and petroleum products account for two thirds of total

export trade. Because of this dependence on the primary industry sector, the trade balance is very sucesptible to international market conditions. Industrial machinery, agricultural machinery, raw materials, and agricultural chemicals are practically all imported so that Kenya is always in short of foreign currency. Kenya also depends on imports for all of its crude oil demand, the essential prerequisite to keep the nation's agricultural and industrial sectors operating. Table 2-7 and 2-8 show the main exports and imports by principal commodities category. For the four-year period from 1986 to 1989, the overall value of exports has remained practically stagnant, while imports rose 67 percent, putting considerable strains on the nation's financial position.

Table 2-7 Export by Main Commodities

(Unit : million lbs)

	1986	1987	1988	1989	1990 (prov.)
Coffee bean	388.5	194.6	244.5	203.8	221.0
Tea	172.8	163.4	185.3	271.9	314.5
Petroleum product	99.0	95.2	110.3	101.9	140.2
Cement	13.4	9.9	10.4	10.9	12.6
Sizal flax	10.9	9.9	11.9	16.3	18.9
Pineapple(canned)	24.2	25.8	25.1	-	-
Total export volume	958.0	753.4	917.8	999.8	1,204.7

Source : 「Economic Survey 1991」

Table 2－8 Import by Main Commodities

(Unit : million lbs)

	1986	1987	1988	1989	1990 (prov.)
Petroleum	207.8	245.1	210.4	299.1	422.0
Industrial equipment	236.7	278.2	395.5	460.2	596.8
Steel	64.4	84.5	120.6	152.0	164.8
Car･Chassis	88.0	107.8	138.1	175.0	195.2
Petroleum product	27.9	33.8	30.0	40.1	55.6
Synthetic resins	41.4	56.4	80.9	75.7	83.5
Medicines	32.7	38.2	43.7	56.2	57.6
Fertilizer	50.0	39.0	49.2	69.4	33.3
Agricultural equipment	19.7	26.7	29.5	26.9	28.0
Paper･Paper product	20.9	21.8	36.2	47.6	41.0
Total import volume	1,337.9	1,430.9	1,765.1	2,239.0	2,545.6

Source : 「Economic Survey 1991」

2.1.6 Aid Received from Foreign Countries

1) Kenya has politically aligned with the West an maintained a relatively stable political profile. Economically, it has consistently adopted a free-market system and thus been able to attract foreign aid from sources such the leading western industrialized nations and international organizations receiving almost 1 billion US dollars a year. The following overview sums up foreign aid received by Kenya from the leading industrialized countries in recent years.

Country	Contents of Aid Received
U.S.A.	USA has given aid to Kenya since 1954, amounting to a cumulative total of 800 million US dollars by 1988. The ratio of grant/loan aid stands at 80/20. In January 1990, the US decided to waive claim of 160 million US dollars. The claim is waived with the progress in Kenya's Structural Adjustment Program.
United Kingdom	Since the independence in 1964, the UK has provided Kenya with over 550 million pound sterling. The aid funds were made available by Britain's Overseas Development Administration (ODA), which has been made grant aid at an average rate of 30 million pounds sterling. a year. A focal point of British aid policy is the UK's interest to support Kenya's Sixth Five-Year Plan.
Former Federal Republic of Germany	FRG extended aid to Kenya on the basis of biennial contracts with a sum of approximately 150 million DM. Kenya's indebtedness toward the FRG reached a cumulative 2.1 billion DM as of 1990. Two thirds of German aid is on a loan basis, and the remainder constitutes grant aid. In its aid policy, the (former) FRG concentrates its attention on support for the policy objectives enunciated in the Sixth Five-Year Plan.
The Netherlands	The Dutch government grants aid to Kenya at a level of 30 - 40 million US dollars a year. In general, Dutch aid is extended in the form of grant. Loan is considered to be supplementary.
Denmark	Until 1990, Kenya's indebtedness towards Denmark amounted to a cumulative total of 250 million US dollars. This includes 100 million US dollars of loan. Aid is granted at a level of 20 - 30 million US dollars a year. Danish aid is provided through DANIDA.
Japan	Aid given to Kenya by Japan stood at total of 205.7 billion yen untill 1990. This breaks downs into (1) 129.5 billion yen of loan, (2) 43.3 billion yen of grant aid, and (3) 32.9 billion yen of technical assistance. (Based on the 1989 figures, Japan's share in total world aid to Kenya stood at 24%, British aid at 12% , and US aid at 10%.) The ratio of loan/grant/technical assistance is 63/21/16%.

Since 1986 aid received by Kenya from the Japanese government under the Overseas Development Assistance was at the highest level of all foreign aid. In 1989, bilateral aid reached approximately 147 million US dollars and accounted for 24 percent of all foreign aid received by Kenya and amounting to 620 million US dollars. Aid support from the International aid organizations such as the World Bank, IDA, and the Arab Countries has also shown a sustained rising trend year after year, reaching a level of 36 percent of total aid. (See Table 2-9.)

Table 2-9 Receiving Account of ODA

(Unit : million dollar)

	1985	1986	1987	1988	1989
U.K.	32.5	34.9	32.2	75.1	72.6
U.S.A.	73.0	29.0	43.0	52.0	59.0
Japan	29.6	49.8	63.7	144.7	147.8
Canada	23.0	25.3	19.6	24.0	22.1
Denmark	24.6	25.9	27.1	35.4	33.9
France	17.2	32.1	29.4	32.2	30.9
Italy	6.4	31.7	33.1	37.6	56.0
Germany	34.5	43.0	52.4	55.9	56.1
Netherlands	19.6	44.4	56.5	56.7	49.0
Total	328.9	382.8	444.1	609.8	620.6
Arab league	21.4	4.7	4.1	3.4	Δ0.4
World Bank	2.5	0.8	—	—	—
IDA	33.4	28.2	69.9	95.0	223.0
International body total	87.7	68.0	123.8	195.3	351.8
Total	438.1	455.5	572.0	808.5	972.0

Source : 「Geographical Distribution of Financial Flow to Developing Countries, 1990」

2) Japanese Financial Aid under the ODA

Cooperation extended by the Japanese government to the Republic of Kenya in the health and medical sectors has taken the form and proportions described later in the table 2-20. Until the end of 1990, Japanese aid reached a cumulative total of 129.5 billion yen in loan and 43.3 billion yen in grant aid as well as 32.9 billion yen in technical assistance.

The purposes for which aid has been granted include a variety of

areas, concentrating in the main on the essential activities such as food, agriculture, health, medical care, forestry, water supply, etc. In addition to the basic sectors, projects to provide a basic infrastructure, including transport, traffic, and telecommunications have also been taken for ODA and so is projects aimed at industrial promotion and export encouragement through Structural Adjustment Aid. Table 2-10 shows Japanese aid for the last five years.

Table 2-10 Actual Result of Japanese ODA

(Unit : million dollar)

year	Grant			Loan		Total
	Grant aid Assistance	Technical Cooperation	sum	Annual expenditure	Original expenditure	
86	17.74 (36)	15.26 (31)	33.00 (66)	21.88	19.79 (34)	52.79 (100)
87	18.19 (29)	20.08 (32)	38.27 (60)	31.35	25.46 (40)	63.73 (100)
88	42.80 (30)	22.15 (15)	64.95 (45)	85.43	79.78 (55)	144.73 (100)
89	42.95 (29)	22.76 (15)	65.71 (44)	87.95	82.10 (56)	147.81 (100)
90	49.59 (53)	25.93 (28)	75.52 (81)	25.73	17.67 (19)	93.19 (100)

Note : ( ) =percentage of each assistance in ODA Total

2.2. Overview of Kenya's Medical and Health Sector

2.2.1 Health Conditions in General

Table 2 - 11 compares the health conditions of various countries with those of countries in the East African region. Kenya's statistics for 1989 give the country's total population as 23.9 million. The population is increasing at a high average rate of growth of 3.4 percent. Infant mortality is given as 64 per 1000. The average life expectancy at birth is 61 years, and has shown signs of a certain improvement in recent years. Compared with the countries of Southeast Asia, this does not indicate a favorable level. Data on mortality and morbidity are extremely scarce for the country as a whole, but a UNICEF report of 1988 states that the main causes of death under the age of five are acute respiratory infections, infections of the digestive organ, and measles. These diseases account for 50 - 55 percent of total mortality. These types of diseases are rooted in the

inadequacies of living conditions, notably a chronic state of malnutrition and a lack of public hygiene. The diseases with the highest incidence are malaria (21.5%), acute inflammation of the respiratory organs (20.5%), skin diseases (10.6%), and intestinal parasitism (5.1%).

Table 2-11 Comparison of Health Indication Between each Countries(1990)

	Population (million)	Birth-rate (/1,000 pop.)	Mortality (/1,000 pop.)	Life expectancy	Infant mortality at birth (/1,000 bir.)
Total	5,292.2	26	9	66	63
Advanced industrial countries	1,206.6	14	10	75	12
Developing countries	4,085.6	30	9	63	70
Africa	642.1	43	13	54	94
East Africa	196.9	48	15	53	103
Burundi	5.5	47	16	50	110
Ethipia	49.2	48	18	47	122
Kenya	24.0	47	10	61	64
Madagascar	12.0	45	13	56	110
Malawi	8.8	55	19	49	138
Mauritius	1.1	17	6	70	20
Mozanbique	15.7	44	17	49	130
Rwanda	7.2	50	16	51	112
Somali	7.5	47	18	47	122
Uganda	18.8	51	14	53	94
Tanzania	27.3	50	13	55	97
Zambia	8.5	50	12	55	72
Zimbabwe	9.7	40	9	61	55
South-East Asia	444.8	28	8	63	55
Cambodia	8.2	37	15	51	116
Indonesia	184.3	27	8	63	65
Laos	4.1	44	15	51	97
Malaysia	17.9	28	5	71	20
Myanmar	41.7	30	9	63	59
Philippines	62.4	30	7	65	40
Vietnam	66.7	30	8	64	54
Japan (1988)	110.0	10.7	6.5	77('85)	4.8

Source : UNFPA Statistics (1990)

2.2.2. Medical and Health Administration

The Kenyan government has established the following specific policies to achieve following main objectives of its Health and

Medical Administration: Qualititative improvement of provincial health care, family planning and maternal and child health, measures to control infectious diseases, and measures to improve hygiene. Through these policy programs the government hopes to make a contribution to the provision of better health and medical care and improved hygiene for the nation. With the objectives, the government of Kenya embraces the goals expressed in the WHO slogan "Health for All Nations by the Year 2000." In more specific terms, the government policies on health are as follows:

a. Securing the funds necessary to extend medical services
b. Bearing the medical costs by the patient. (Kenya has begun to introduce a system requiring the patient to bear the costs of hospitalization and medicine.)
c. Establishing a medical health insurance system.
d. Contribution from private-sector (Expansion of the medical service with the cooperation from private sector)
e. Medical service management (Establishing a management system for medical service, budget policy and budget management)
f. Securing health care personnel
g. Expansion of primary health care services
h. Improvement of the preventive and treatment services (so far, prevention has been given priority, and treatment is now also being emphasized).
i. Improvement in maternal and child health
j. Consideration of improvement of environmental conditions to ensure better health (water, hygiene, pollution, food hygiene)
k. Review of the role of traditional medicine.

The entire medical health service is run by the Ministry of Health whose administration extends to Kenyatta National Hospital, provincial hospital and district hospital and even to the end organs of the medical service system, the health centers and dispensaries. In the metropolitan area of Nairobi, however, the large population concentration and the large number of health centers and dispensaries make it difficult for the Ministry of Health to

exercise direct control so that the Nairobi Municipal Council is the managing and controlling body. In the provinces, people depend on the non-government medical facilities to a large degree. This applies, in particular, to the private medical facilities and the medical services offered by the charity organizations, which play a significant role, offering a total of 7,000 beds, roughly 20 percent of all beds available.

Table 2-12 indicates the trend in number of the beds by region from 1988 to 1990. The number of total beds are increasing, but the number of beds per 100,000 population are decreasing. This occurs due to the fact that the expansion of the facilities can not catch up the increasing population.

Table 2-12 Trend in Number of Beds by Region

	1988		1989	
	Number of beds	Number of beds / 100,000 pop.	Number of beds	Number of beds / 100,000 pop.
Nairobi	5,696	420	5,696	399
Coast	3,186	161	3,276	159
Eastern	4,601	114	4,745	113
North Eastern	414	71	414	68
Central	4,883	143	5,030	142
Rift Valley	6,250	127	6,330	123
Nyanza	4,259	106	4,259	102
Western	2,694	102	2,784	102
Total	31,983	141	32,534	138

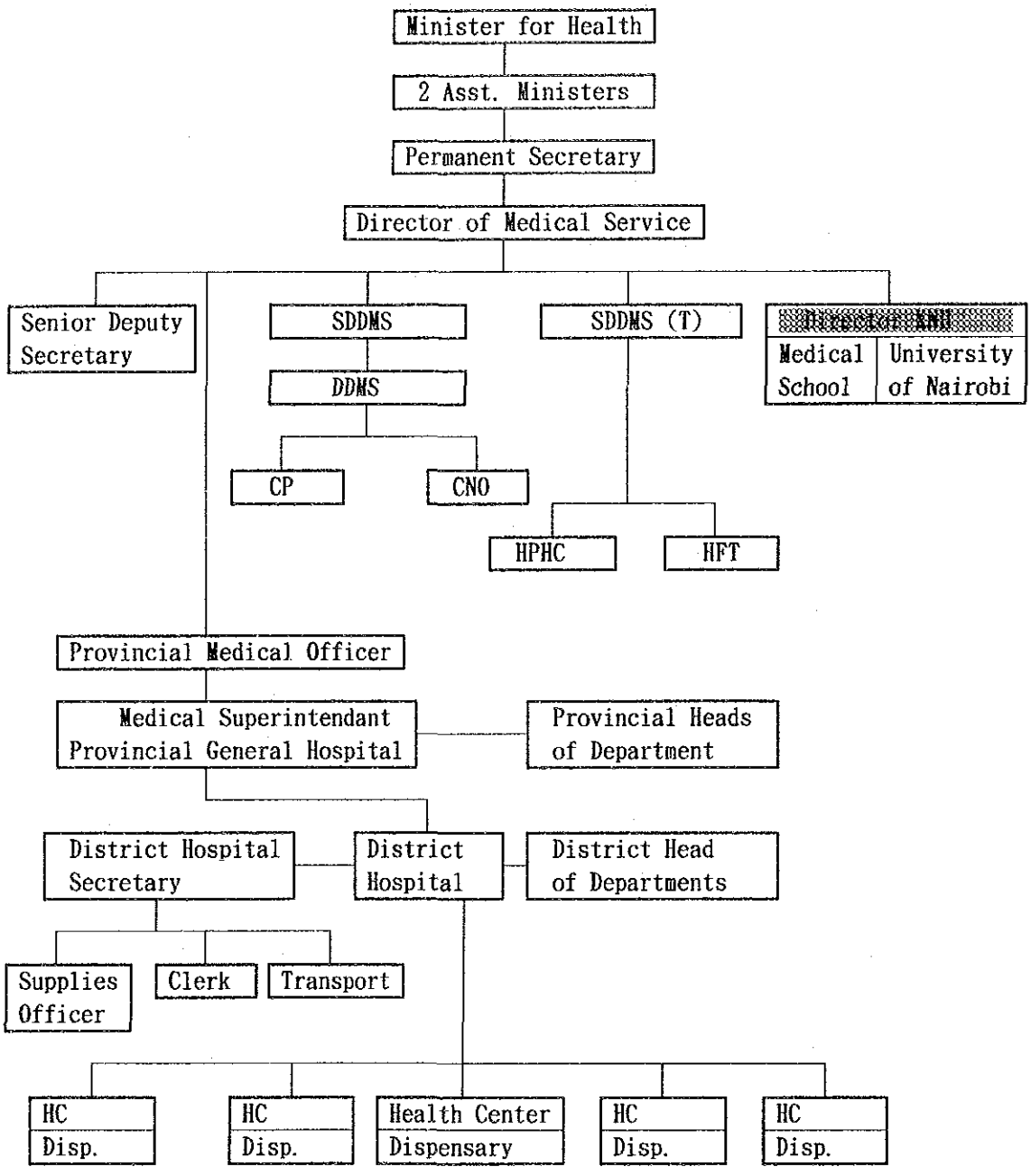
Source : MOH

(1) Oganization and Structure of the Medical Health Administration

Administratively, Kenya consists of one Special Province and seven provinces (Central, Coast, Eastern, North Eastern, Rift Valley, Nyanza, and Western). With exception of the Special province, the metropolitan area of Nairobi, each province is subdivided into 3 - 13 districts.

Fig. 2 - 3 shows the administrative organization in Kenya's medical health system. Excluding the metropolitan area of Nairobi, central government through the Ministry of Health exercises full control of all parts of the health system. The Kenyatta National Hospital, however, differs from other medical insitutions both in its organization and operation, in that it has the position of being a component within the Ministry of Health. It is managed under self-control by the Management Supervision Committee appointed by the Ministry of Health.

Figure 2－3 Health & Medical Administrative Organization in Kenya



Source: MOH

SDDMS: Senior Deputy Director of Medical Services
SDDMS(T): Senior Deputy Director of Medical Services, Training and Primary Health Care Services
DDMS: Deputy Director of Medical Services
CP: Chief Pharmacist
CNO: Chief Nursing Officer
HPHC: Head of Primary Health Care
HFT: Head of Faculty Tutors (Medical Training Centers)
DHS: District Hospital Secretary
HC: Health Center
DISP.: Dispensary

In the structure of the Health and Medical Administration, the Ministry of Health establishes programs, plans, and adjustment measures for the administration of health, medical care, and hygiene. The departments of the Ministry are responsible for the disease prevention and therapeutic services, epidemiology, statistics, the control of infectious diseases, nutrition planning, family planning, nursing, environmental hygiene, pharmaceutical control, inspection services and the many other tasks associated with medical health care. The Provincial Medical Officers throughout the country act under the Ministry of Health and its Departments to provide medical health services through the regional and district Medical Health Offices.

(2) The Kenyan Medical Health System

1) Composition of Medical Facilities

The Medical Health System of Kenya is supported by public, private medical facilities and medical institution established by charity organizations. As of 1984, the number of hospitals was 182. As shown in Table 2-13, 26% of these hospitals, that is, 48, were private medical institutions and 23% or 42 were institutions established by charity organizations. In Kenya, the non-government medical institutions play a very big role in the provincial/regional health services. The Kenyan government intends to improve its health and medical systems by including these private and charity-run medical institutions into its overall medical service programs for the provinces and regions.

Table 2-13 Number of Medical Facilities by Division (1984)

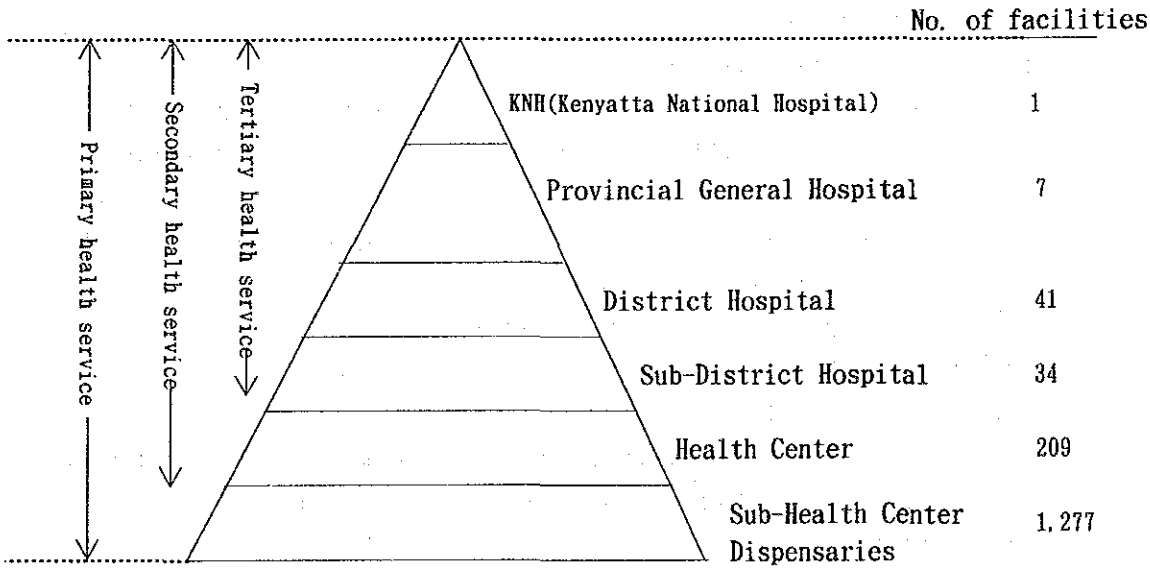
	Hospital	Rate of bed possession against whole beds	Health center	Sub health center Dispensary
Public institution				
MOH control	80	65%	31	1,277
Military Hospital control	2	1	43	
Prison control	9	1	28	
Self governing community control	1	1	107	
Charity institution	42	21	11	237
Private institution	48	11	22	76
Total	182	100%	242	1,590

Source : MOH

2) System of Public Medical Institutions

As stated above, Kenya is divided into eight provinces (regions) and 40 districts. The Medical System is organized on a hierarchical division. At the apex of this hierarchy is the Kenyatta National Hospital. The provincial hospitals and the district hospitals provide services mainly in the secondary and tertiary area of medical service. The Health Centers, Sub Health Centers, and Dispensaries function mainly in the primary medical care service. Appendix 5 shows the number of beds and in-patient numbers for each province.

Figure 2 - 4 Health Organization in Kenya (Government Origin)



3) Role Played by the Medical Facilities

Both the public and private medical service institutions are organized so that their facilities provide a service range covering either all or only part of the medical service ranging from primary through secondary to tertiary medical service. Table 2-14 shows the role each medical institution has within this system. It can also be seen that the Kenyatta National Hospital is both a general national hospital and at the same time, a provincial hospital in Nairobi offering medical services

at the provincial level in the areas of primary and secondary medical service.

Table 2-14 Role Played by the Different Medical Facilities

Name of Medical Facility	Number of Facilities	Number of Beds	Contents of Activities
Kenyatta National Hospital	1	2,000	The only general national hospital in Kenya. being as the top-referral hospital for all hospitals and facilities. Also it is a teaching hospital for medical staff (doctors and nurses) training. Provide high-level, advanced treatment services. It may be considered as fully equipped for its function in terms of bed availability, number of medical departments covered, number of medical staff, variety of medical equipment, and drug availability.
Provincial Hospitals	7	3,100	Approx. 200 - 700 beds each. A few medical specialists and general doctors, nurses laboratory technicians, dentists, and paramedics are available in the general hospitals at the provincial level. X-ray equipment, surgical and laboratory facilities are being equipped. Some facilities train specialists.
District Hospitals	52	12,000	Approximately 50 - 300 beds each. Services are basically identical to those of the provincial hospitals, they provide these serices at the district level. General medical care available with X-ray units and clinical examination facilities.
Sub-District Hospitals	34	Unknown	Approximately 100 beds each. Medical care is offered mainly by medical asistants. Diagnosis with X-ray equipment early diagnosis and therapy of malaria and dysentery. Treatment by medication (chemotherapy).
Health Center	209	—	In addition to general medical care, services include mainly maternal and child health counseling, vaccination, family planning, nutritional expert's advice/guidance and similar primary health care activities. Doctors are normally not stationed . Instead, one each of medical assistants who have graduated from a Medical

Name of Medical Facility	Number of Facilities	Number of Beds	Contents of Activities
Health center			Training Center (<TC), nurses, or public hygiene officers are at the health center as the minimum necessary unit to provide the medical services. These health centers have no in-patient facilities. They are able, however, to accommodate mothers for birth for a short time.
Sub-Health Centers & Dispenaries	1,277	—	The terminal facilities at the fringe of the Kenyan Health Service. They have practically no medical equipment or facilities and are staffed by a diagnostician and a enrolled nurse to provide basic medical and nursing care with medication available to a certain extent for malaria and dysentery patients.
Medical facilities /hospitals run by the missions: 42. health center level: 11. dispensary level:237	290 (incl. hospital facilities: 42)	Approx. 9000 beds (Estimated)	Based on religious activities, these provide medical services in the provinces and regions at the fringe of the health system. Their hospitals have 50 - 200 beds each and are equipped for general medical care.
Medical facilities /hospitals run by the private organizations: 48. At health center level: 22. At dispensary level: 76	146	Approx. 900 beds (Estimated)	As a large private hospital facility, this part of the system offers some 200 beds in the metropolitan area of Nairobi. The AGAKARN, Nairobi and M.P. SHAR hospitals offer medical services, including tertiary service, and so does the Mombassa Hospital (approximately 80 beds). Since these large hospitals are only stationed in the large cities, the number of people benefitting from their services is not so large. The dispensaries of the private medical care system are at about the level of the regional pharmacies.

Source: MOH

(3) State of Medical Staffing

Medical personnel in Kenya was given in 1989 as amounting to 3,266 doctors, 562 dentists, 413 pharmacists, and 10,289 nurses. (See Table 2-15.) Thus, there is one doctor for a population of approximately 7,300.

Table 2-15 Trends in Numbers of Health Personnel

Personnel	1985	1986	1987	1988	1989	No. / 10,000pop.
Doctors	2,842	2,980	3,071	3,176	3,266	1.4
Dentist	384	441	492	527	561	0.2
Pharmaceutist	231	---	362	388	413	0.4
Pharm. tech.	459	493	494	525	559	0.2
Registered nurses	9,377	9,627	9,862	10,009	10,289	4.4
Enrolled nurses	11,248	12,452	13,202	14,078	15,200	6.5
Clinical officer	2,107	2,224	2,355	2,464	2,534	1.1
Public H. officer	420	450	480	515	550	0.2

Source : MOH (1989)

(4) Education of Medical Staff

General education takes 16 year, including eight years at primary school, four years at secondary school, and four years at university or two or three years at a special college.

For becoming a doctor, the educational process entails a six-year course at Nairobi University, Schoold of Medicine after completing secondary school. After the six-year medical course, there is one year of internship education. Nurses, X-ray radiologists, and laboratory technicians receive a three-year training program at a Medical Training College. Assistant Technicians and enrolled Nurses are required to take a two-year course at a Training College.

Students for doctor course are educated currently at the Nairobi University, School of Medicine, which gives about 120 graduates each year. In 1989, the MOI University inaugurated a Medical Department, educating 40 students a year. Paramedical education is provided in 26 training centers. These include the Medical Training Centers of the Nairobi and Mombasa and the Medical Training Schools belonging to the Provincial hospitals. Registered and enrolled nurses, medical assistants, radiologists, clinical examiners, medical work

therapists, and medical physiotherapists are trained at these training facilities. This demonstrates the efforts the Kenyan government is making to train the nation's medical personnel. At present energetic efforts are being made to expand the facilities, mainly the Medical Training Colleges and Medical Training Schools and to train the teaching staff for these training facilities as well as to build new facilities.

(5) Budget Allocated for the Health Sector

According to the data released by the Kenyan government in 1984, the medical health budget is ranked the fifth being 7.1% of the total budget, an indication that it is treated by the government as rather low-priority area. The top four are education (16.6% of the total budget), construction (11.5%), defence (11.4%), and agriculture (11.4%).

In the fiscal year 1990/1991, the allocations made in the national budget to the Ministry of Health amounted to 116.67 million Kenyan pounds (approximately 9.73 billion yen). 75.23 million Kenyan pounds or 64% of the total budget is allocated for medical treatment expenses throughout Kenya, including in particular the Kenyatta National Hospital.

Table 2-16 Budget Contents of MOH (1990/91)

	1989/90 Budget amount	1990/91 Annual Expenditure	1990/91 Assignment of aid	1990/91 Original Expenditure
	(£)	(£)	(£)	(£)
General management expenses and developing cost	3,248,089	3,710,288	231,200	3,479,088
Treatment expenses	70,209,158	93,461,307	18,228,722	75,232,585
Preventive medicine and public health activity expenses	10,936,877	15,346,902	1,709,437	13,637,465
Regional health service expenses	12,328,079	18,622,764	1,200,000	17,422,764
Health training expenses	5,167,972	7,810,115	1,470,310	6,339,805
N.H.I.F.	600,000	2,500,000	2,500,000	—
Other management expenses	737,349	1,280,293	714,000	566,293
Total	102,027,524	142,731,669	26,053,669	116,678,000

Source : MOH

(6) Medical Insurance System

Kenya has now introduced a Medical Insurance System endowed by the National Hospital Insurance Fund. Insurance premiums are complusory collected by way of statutory deductions from the income (wages or salaries) of the insured. The amount of insurance premium payable by the insured is determined by the insured's income. The premium are different in the range from the minimum of 30 Kenyan shillings to the maximum of 320 Kenyan shillings (payable on the monthly income). For low-wage earners, exemption from insurance premium may be granted. For the self-employed, the entry to a private insurance scheme is allowed on their own choise.

In-patients being covered under the medical insurance are generally entitled to receive treatment free of charge and may choose to take a paid bed available on a discounted rate.

Out-patient treatment, radiology, and clinical examinations are generally given on a fee paying basis as the Insurance Fund will not reimburse these costs.

The medical institution can claim the costs for treating patients on the Insurance System to the National Hospital Insurance Fund in accordance with the Insurance Claims Procedures stipulated by the Fund. There are limits, however, on the maximum amount claimable from the Fund. Even for a medical establishment of the highest rank, this amount is limited to 400 Kenyan shillings, a level not even covering 5 - 20 percent of the actual costs incurred. Being different from private medical facilities, the medical facilities of the public health system are compelled to operate their functions at a deficit since their medical services are basically free of charge.

2.2.3. National Health Plan

The Health, Medical Care, and Hygiene Development Programs of the Kenyan Ministry of Health imposes the following main subject:

① Eradication, prevention, and control of diseases

② Provision of appropriate and effective medical care services for the nation as a whole.

③ Promotion and upgrading of medical research

In order to proceed with these main subject, the Ministry has drawn up its Medical Health Policy by highlighting the following five aspects as the most important problems:

① Qualitative improvement of regional health care

In some regions, medical health care is not conducted well as a result of budgetary constraints. To expand the regional care facilities, budget allocations for the expansion should be treated as important priority area so that medical services can be activated at the regional level to help promote the government's measures to prevent diseases.

② Health guidance for maternal and child health and family planning

One of Kenya's problems is the high birth rate, the high maternal and infant mortality. Measures to combat these problems are seen as major issues for Kenya as a whole. Efforts are made to reinforce health counselling and guidance for mothers and child and strengthen family planning.

③ Measures to control infectious diseases (including diseases due to insects carrying and spreading pathogenic bacteria)

The following are the main diseases to which the measures to control infectious diseases are taken.

Cholera, dyphtheria, dysentery, measles, meningitis, whooping cough, rabies, tetanus, trachoma, and anthrax.

A nationwide development program is in progress to establish measures for the prevention and cure of these diseases.

Research on diseases due to germ-carrying insects is being carried out at the Kenyan Medical Research Institute (KEMRI) established in the fiscal year of 1982/1983 with a grant aid by the Japanese government.

④ *Public Hygiene Measures*

Expansion of water supply to all households, improvement of water quality, sewage treatment, garbage disposal are to be promoted.

⑤ Expansion of the National Family Welfare Center

The center provides counselling services on maternal and child health and on family planning, and efforts are made to increase its budget and train staff.

The Five-Year Plan promotes the issues in question and tries to achieve further progress in terms of the target policy of health, medical care, and hygiene and stresses the following areas.

- In addition to the expansion of the public medical care facilities and medical services, the increase in the population will lead to an increase in patient numbers so that measures will be taken to increase the budget to provide more extensive medical services.
- Measures for the inhabitants of remote areas who have no access to the medical health services.
- Measures to overcome the present shortages of staffs who run the health and medical services and the management of facilities.
- Measures to overcome the problem of worsening hospital management efficiency in terms of the extremely high level of bed occupancy
- Programs to educate the public in general with correct medical information on maintaining health and measures to overcome the present inadequacy of educational and training opportunities

2.2.4 Morbidity Condition

(1) Indices of Health and Hygiene Standards

Table 2 - 17 shows the most important data indicative of the nation's state of health and hygiene. In 1974, the United Nations carried out a survey showing that the infant mortality in Kenya would be 64 per population of 1000 in 1990. The same also indicated that mortality under the age of five would be 110 per population of 1000. There have been successive improvements over the year, but there are differences according to the regions. In the coastal areas, in particular, the situation is extremely bad, with mortality and morbidity rates double those in the central regions. Data on the causes of death and the morbidity pattern are scanty. A UNICEF report compiled in 1988 indicates, however, that the main causes of mortality under the age of five are acute infections of the respiratory organs, infections of the digestive organs, and measles. These diseases account for 50 - 55% of total mortality under the age of five. The underlying causal factor, however, is chronic malnutrition.

Table2-17 Health Indication in Kenya

	(1979)	(1990 UNFPA)
Increase rate in population:	+ 3.8%	+ 3.7%
Population:	15,300,000	23,900,000
Life expentacy at birth:	54	61
Birth rate:	52/1000 pop.	47/1000 pop.
Crude death rate:	14/1000 pop.	10/1000 pop.
Infant mortality:	104/1000 pop.	64/1000 pop.

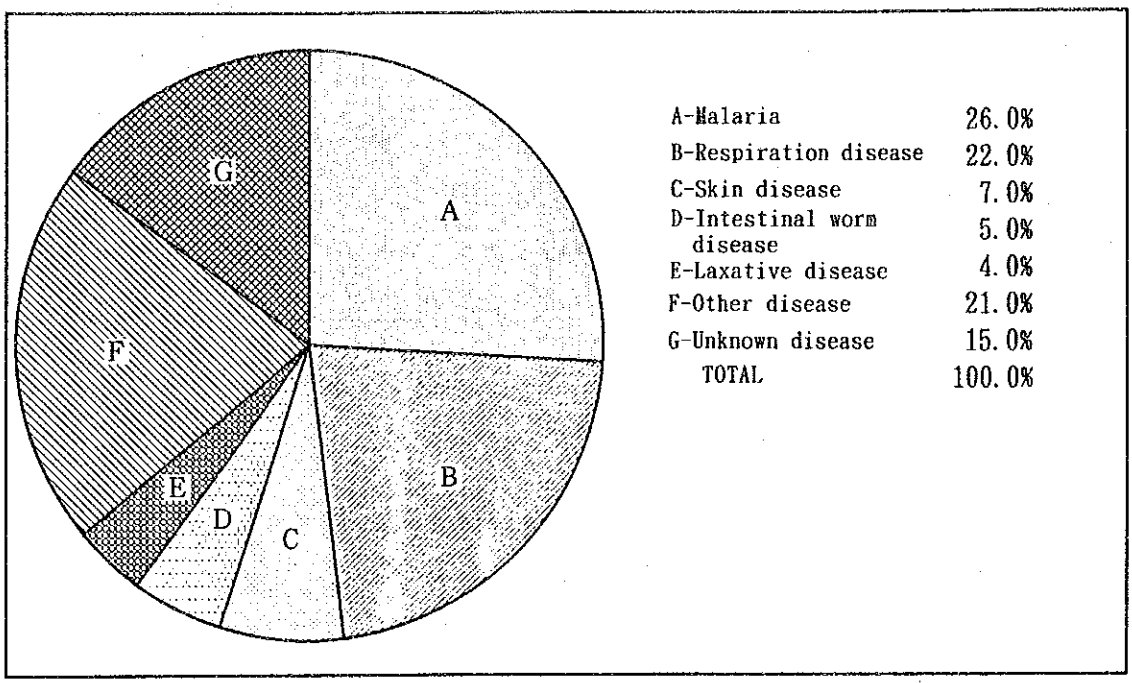
Source : UNFPA Statistics

(2) Current Morbidity Pattern

1) Diseases Composition

Kenya has an inadequate public hygiene infrastructure, Kenya's population does not have sufficient knowledge or awareness of the problems of health and hygiene. As a result, Kenya has a high incidence of diseases caused by infections such as malaria, dysentery/diarrhea, parasitic diseases of the small intestines, infections of the respiratory organs, and contagious hepatitis.Fig. 2 - 5 shows the relative shares of each of these diseases, and Fig. 2 - 6 gives the incidence statistics for these diseases. It can be seen that malaria has the highest incidence of 5.8 million patients in 1989, equivalent to a share of 26% of total morbidity. Kenya has many upland regions with a low distribution of the malaria-bearing mosquito, so that in these areas, there must actually be a low incidence of malaria. It may therefore possible that the reported high incidence of malaria exists in many cases by a mistaken diagnosis for febrile diseases of unknown origin.

Figure 2 – 5 Rate of Main Disease



Source: MOH

Figure 2-6 Top Ten Leading Out-Patient Diagnoses, 1989, Kenya

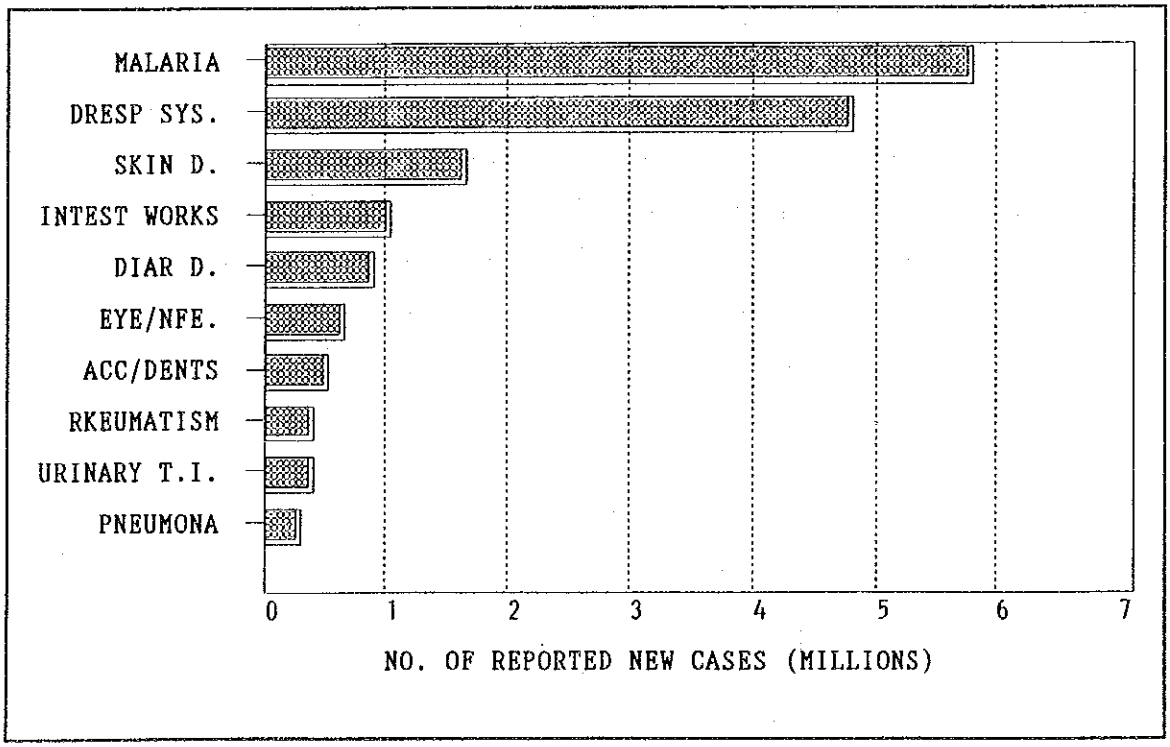


Table 2-18 shows the transitions in the incidence levels for the main diseases over the three year period 1986 - 1988. While there is generally a decrease in the reported patient number and incidences, this does not signify a decrease of the diseases. Rather, this is only an apparent decrease due to the decline in the medical services as a result of dwindling budgetary allocations to the medical care facilities.

Table 2-18 Number of Main Disease, Comparison of Rate of Disease

Disease	1986		1987		1988	
	Number of disease	Rate of disease	Number of disease	Rate of disease	Number of disease	Rate of disease
Malaria	4,574,015	23.95	4,067,572	23.41	4,099,138	23,33
Respiration disease	3,953,557	20.70	3,643,164	20.97	3,418,119	19.46
Skin disease	1,278,684	6.70	1,295,042	7.45	1,289,180	7.34
Laxative disease	1,032,422	5.41	823,595	4.74	823,096	4.69
Intestinal worm	943,896	4.96	823,689	4.74	788,455	4.49
Rheumatoid	405,114	2.12	344,451	1.98	473,275	2.69
Eye disease	507,915	2.66	463,209	2.67	449,123	2.54
Accident	458,501	2.40	393,472	2.26	399,742	2.28
Anemia	401,060	2.17	294,926	1.70	315,166	1.79

Source : MOH

2) Infectious diseases

The main diseases responsible for Kenya's mortality due to infectious diseases are given as enteritic and diarrheal diseases, tuberculosis, cholera, malaria, dysentery, and tetanus. Table 2-19 shows the changes in the officially reported cases of infectious diseases and in the number of deaths due to these diseases during the period from 1983 through 1985. Gonorrhea is conspicuous as a disease claiming the highest incidence, although this is not a lethal disease.

Table 2-19 Number of Reported Main Infection and Death

	1983		1984		1985	
Disease	Case	Death	Case	Death	Case	Death
Enteristis and diarrheal disease	118,169	147	231,924	97	77,120	185
Tuberculous	4,404	147	4,874	164	2,390	162
Cholera	2,527	69	1,608	105	592	74
Dysentery	43,771	31	60,618	44	59,585	44
Malaria	65,414	55	48,738	58	25,888	30
Infectious hepatitis	1,651	10	1,331	13	1,189	22
Eye disease	21,202	---	23,164	---	20,222	29
Tetanus	339	51	246	36	676	16
polio	197	2	115	1	303	17
Rabies	582	13	22	15	17	---
Kala-azar	484	6	574	5	37	---
Schistosomiatis	14,792	---	8,486	1	5,867	---
Amoebiasis	10,108	---	11,480	3	14,630	---
Anthrax	62	---	238	1	114	---
Gonorrhea	150,220	---	143,492	---	88,884	---
Typoid fever	1,177	10	64	8	1	---
Menigitis	949	36	824	56	---	---
Leprosy	581	1	443	---	27	---

Source : MOH

Note : --- = indistinct statistics

2.3. Trends of Aid Organizations

(1) Current Status of International Cooperation in the Area of Health and Medical Care

Table 2-20 sums up the aid extended by the Aid Organizations for Kenya in recent years.

Table 2-20 Bilateral Aid and Aid from International Organizations

Aid-Provider	Name of Project	Amount
World Bank	・Program for the Reconstruction of the Kenyan Medical Health System (1991 - 1997) ① Kenyatta National Hospital Rehabilitation Program (Reduction in the overall budget burden for KNH and increase in costs for prevention and primary care are to help achieve sounder hospital management) ② Provision of a health service infrastructure for the Nairobi metropolitan area ③ Preparations for policy measures, management and improvement in the medical health area of the future	34.5 million US dollars (provided by IDA 31 million US dollars) (22.6 million US dollars) (4.9 million US dollars) (7.0 million US dollars)
Agency for International Development, U.S.A. (USAID)	・Introduction and promotion of the health care finance program, imposing of the users of the system charges payable for the use of public health care facilities, including the Kenyatta National Hospital	15 million US dollars
United Nations International Children's Emergency Fund (UNICEF) World Health Organization (WHO)	Expanded Program of Immunization (EPI) ・To reduce infant morbidity, mortality, and disablement in Kenya, this program has been effective since 1980 to promote immunization against the following six diseases: Tuberculosis, tetanus, dyphtheria, whooping cough, rubeola, and polio	
GTZ (German Government Development Aid Body)	・Program for training hospital maintenance engineers (Opening courses in machine and equipment, including medical equipment, maintenance at the Mombassa Polytech, to train 30 engineering students a years on a three-year course.	
The Netherlands	・ Program for the provision of X-ray radiological diagnostic equipment Installation of X-ray diagnostic equipment at provincial and	20 million US dollars

Aid-Provider	Name of Project	Amount
	district hospitals in all parts of Kenya (approximately 100 units), computerized tomography equipment (2 units), ultrasonic diagnostic equipment (approximately 40 units) and installation of X-ray diagnostic machinery and CT scanners worth approximately 4 million US dollars at the Kenyatta National Hospital in 1991/92.	
Belgium	• Program for the provision of telephone exchangers at the Kenyatta National Hospital Supply and installation in 1990/91 of telephone exchangers for intercom communication in the hospital on the basis of an grant aid fund.	0.8 million US dollars
Japan (Grant Aid)	• 1974: Disaster fund aid (against an outbreak of cholera) (Through the Japanese Red Cross) • 1980: Medical Materials Infrastructure Program • 1982/83: Program for the construction of the Kenya Medical Research Institute (KEMRI) (Technical cooperation) • January 1966 - March 1975: Nakur Hospital (Measures for the Control of Infectious Diseases) • 1967 - 73: EMBU Hospital (Measures for the Control of Infectious Diseases) • January 1970 - March 1978: Kenyatta National Hospital (Measures for the Control of Infectious Diseases) (Technical aid in connection with the start of an intensive care unit and a cardiac surgery department) • March 1979 - March 1984: Measures concerning Research on Infectious Diseases (Cooperation in research on infectious diseases in connection with the establishment of the Kenya Medical Research Institute) • May 1990 - April 1995 Measures concerning Research on Infectious Disease	15 million yen 200 million yen 2,245 million yen

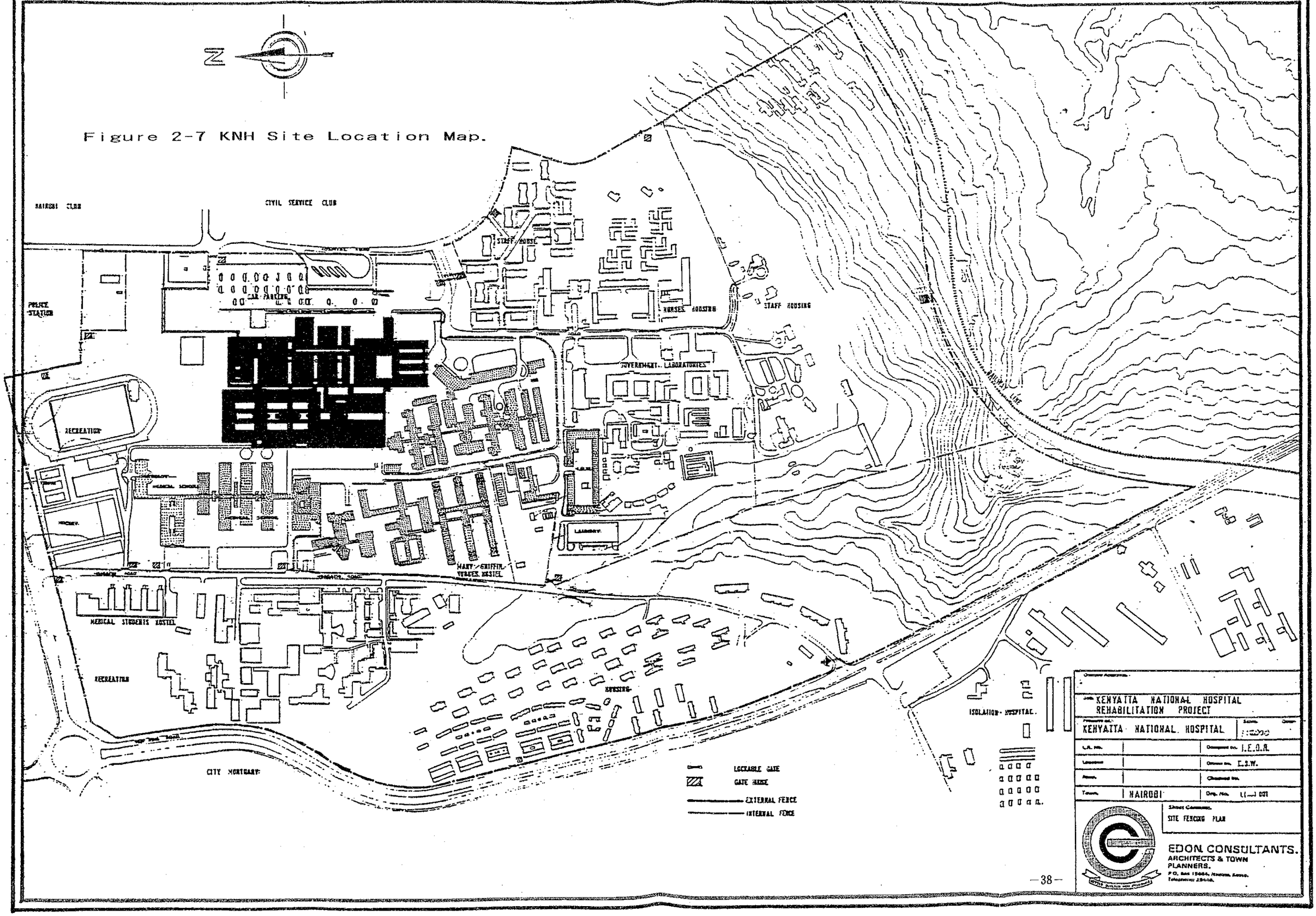
2.4 Outline of Proposed Facilities of this Project

2.4.1 Location of the Proposed Facilities

The Kenyatta National Hospital is located some 2.5 kilometers southwest of the city center of Nairobi. It is situated on the site adjacent to the new ring road and enjoys a relatively peaceful environment with rich green vegetation at a somewhat elevated terrain, as compared with the city center. Its 26.5 hectares of the site are sufficient to accommodate all main hospital facilities, including the hospital buildings with the wards, the examination , administration and medical departments. The hospital with wards for infectious patients is built on 6.25 hectares of the land, The total land area occupied by the above facilities and all adjoining and peripheral facilities such as the accomodation premises for doctors, nurses, and medical students, the research instutions such as the National Public Hygiene Research Institute, and the auxiliary facilities, amounts to 90.25 hectares.

Access to the hospital from the city center is available by public transport by bus services and taxi, and by private car. Near the entrance gate on the east side of the hospital there are four bus terminals. Fig. 2-7 is the site map of the Kenyatta National Hospital.

Figure 2-7 KNH Site Location Map.



KENYATTA NATIONAL HOSPITAL REHABILITATION PROJECT

KENYATTA NATIONAL HOSPITAL

Drawing No. I.E.O.R.

Checked by: I.S.W.

Town: NAIROBI

Sheet Contents: SITE FENCING PLAN

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