BASIC DESIGN STUDY REPORT
ON
THE DISTRIBUTION PROJECT OF MEDICAL EQUIPMENT
IN
THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

OCTOBER, 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to the request of the Government of the Socialist Republic of the Union of Burma, the Government of Japan decided to conduct the Basic Design Study on the Distribution Project of Medical Equipment and entrusted the survey to the Japan International Cooperation Agency. The J.I.C.A. sent to Burma a survey team headed by Dr. Kanji Torizuka, Professor, faculty of medicine, Kyoto University from July 29th to August 15th, 1984.

The team had discussions with the officials concerned of the Government of Burma and conducted a field survey in Rangoon and Mandalay area. After the team returned to Japan, further studies were made and the present report has been prepared.

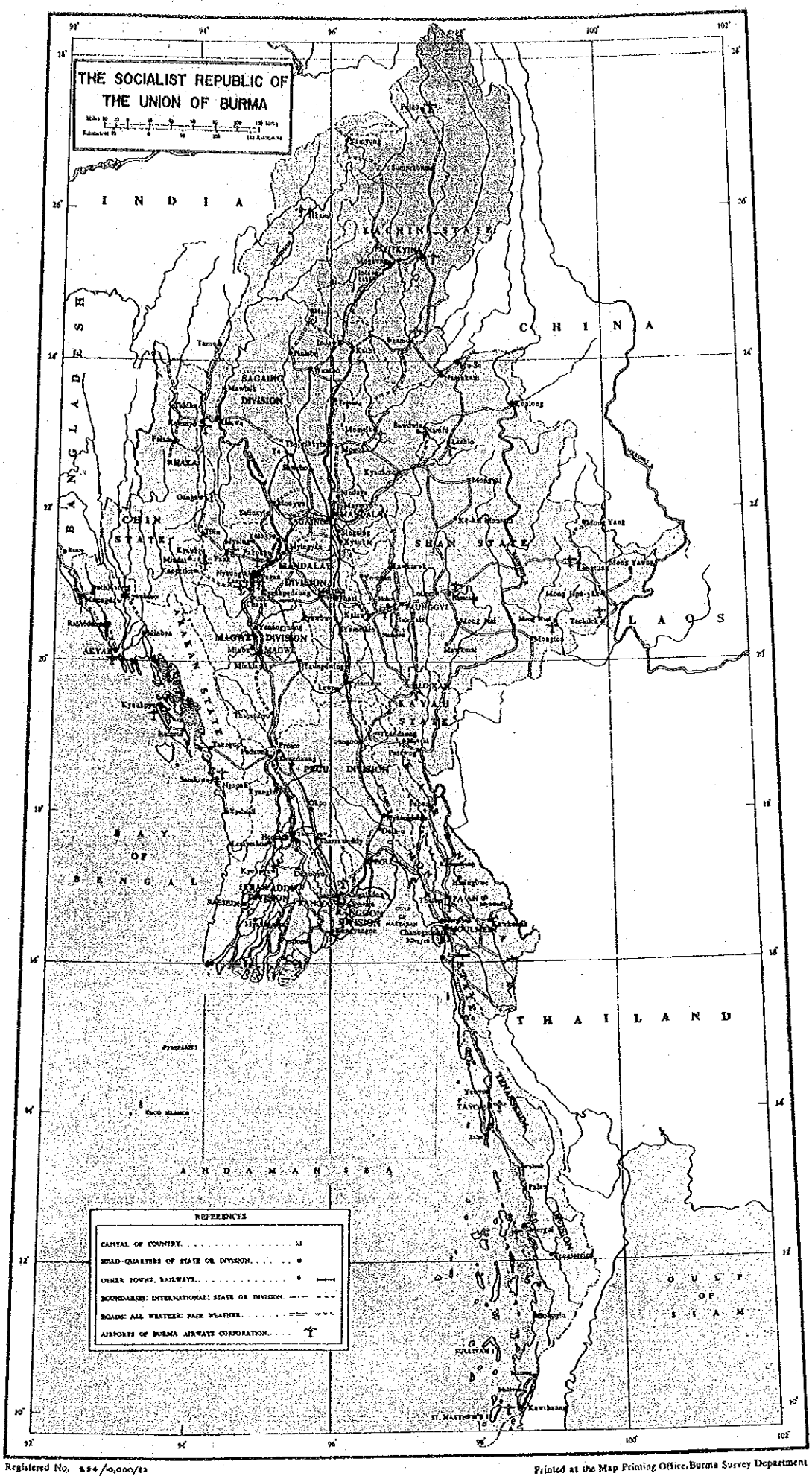
I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Socialist Republic of the Union of Burma for their close cooperation extended to the team.

October, 1984

Keisuke Arita

Keisuke Arita
President
Japan International Cooperation Agency



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SUMMARY

It is a common wish for any nation to enhance the national welfare through an improved level of health care and medical service in order to contribute to a more comfortable society. Burma is no exception.

In accordance with the Country Health Programming advocated by the World Health Organization (W.H.O.), the Socialist Republic of the Union of Burma set up the People's Health Programs with continued efforts to implement it. However, the socioeconomic conditions prevailing in Burma act as a deterrent to self-supporting efforts while the existing circumstances of health care and medical services are far from satisfactory in quality as well as quantity.

For example, medical equipment allocated to health and medical servicing facilities in Burma for the most part fall short in quantity with a noticeable obsolescence that leads to insufficient medical care.

With a view to the background mentioned above, and in an effort to improve in quality fundamental hospital care while preventing the loss and deterioration of people's health due to disease and injury, the Socialist Republic of the Union of Burma has launched on an undertaking which includes the improvement of medical equipment used in major medical centers including Rangoon General Hospital, and the allotment of mobile units distributed to dental and ophthalmic services in community health care. Burma seeks the cooperation of Japan in grant aid for the implementation of this Project.

In response to the request from Burma, the Government of Japan entrusted the Japan International Cooperation Agency (JICA) with the mission to send a team to Burma for an 18-day study from July 29th of 1984 on the Distribution Project for Medical Equipment. Through negotiations with the Government officials concerned, as well as the collection of information and field investigations, the study team identified the details of the request and became well familiar with the background and details of the Project.

The Project is intended to improve the medical equipment to Rangoon General Hospital, Central Women's Hospital, Rangoon Children's Hospital, and Mandalay General Hospital that are playing a key role in the hospital care and medical service of the Socialist Republic of the Union of Burma as well as providing dental and ophthalmic mobile services for community services.

The project in study involves the following categories of hospitals for improvement in medical equipment:

Medical Facilities:

Rangoon General Hospital			
1)	Radio Theraphy	2)	Clinical laboratory
3)	Cardiology	4)	Neurosurgery
5)	Oral, maxillo facial & Plastic surgery Operation theaters		
6)	Ward	7)	Outpatient dental
8)	Uro-surgical	9)	Chest surgery
10)	Operation room		
Central Women's Hospital			
	Delivery		Clinical laboratory
	Neonatal unit		Operation room
	Anesthesiology		
Rangoon Children's Hospital			
1)	Intensive care unit	2)	Pediatrics
3)	Neonatal unit		
Mandalay General Hospital			
1)	Urosurgical	2)	Chest surgery
3)	General surgery	4)	Internal medicine
5)	Clinical laboratory	6)	Obstetrics & Gynecology
7)	Radiology, Darkroom		

Major regional cities
1) Hospitals in 5 major states including Taungi - Project for providing 5 ophthalmic mobile surgical units 2) Central Burma including Monywa - Project for providing 4 dental and X-ray mobile units

The Department of Health under the Ministry of Health of the Government of Burma is responsible for implementation of the Project. When the grant aid takes effect, a total of some 12 months after E/N will be anticipated for the Project to complete installation following the conclusion of the contract.

From the total cost to be incurred for the installation and modification of equipment for the Project, some 1,014,000 Kyats (about ¥28,400,000) will be allotted to the Government of Burma.

Expenses necessary for the operation and maintenance of the Project are estimated at some 505,800 Kyats/year (about ¥15,000,000/year), and should be appropriated from the budget of the Department of Health of the Ministry of Health. The Ministry of Health plans to implement a manpower development program which may help each medical facility to be sequentially staffed by trained personnel. This may prevent major drawbacks to maintenance.

With the subject the Project properly implemented, medical services in regional communities as well as major two cities of Rangoon and Mandalay will be enhanced, thus significantly contributing to the improvement in quality of the medical care of Burma.

The significance of the Project to be implemented through the Japanese Grant Aid is of great importance and a favorable outcome from the contribution is expected.

CONTENTS

CHAPTER 1. INTRODUCTION

Improvement of health care and medical services is of great importance for a country such as Burma which has been plagued with epidemic and endemic diseases in a tropical and subtropical climate. For implemen-tation of the People's Health Programs in compliance with the Country Health Programming advocated by the World Health Organization (WHO), five key programs have been given the highest priority.

These are:

1) Community Health Care Program
2) Hospital Care Program
3) Disease Control Program
4) Environmental Health Program
5) Support Service Program

The Government of Burma planned to improve medical equipment as part of the People's Health Programs, and has recently asked the Government of Japan for a grant aid.

In response to the request, the Government of Japan entrusted a study to the Japan International Cooperation Agency who in turn sent a basic study team to the Socialist Republic of the Union of Burma for an 18-day study from July 29th of 1984 to investigate the validity of the grant aid and the contents of the optimum scale of the Project. (See attached reference 1-1 and 2 for the members and schedule of the study team.)

The study team negotiated with the Government officials concerned, collected information and toured medical facilities for the following reasons.

1. To verify the content of the request for the Project
2. To investigate medical administration
3. To ascertain the whereabouts of higher level projects, or priorities of the Project
4. To verify the contents of the Project itself
5. To verify the maintenance system
6. To collect general data related to medical services

7. To collect of general data on the socioeconomic situation
8. To conduct a field investigation on medical facilities and equipment

The study team negotiated the details of the subject project with officials concerned of the Ministry of Planning and Finance, and with the Department of Health of the Ministry of Health of the Government of Burma. The study team also investigated the medical facilities for the Project and familiarized themselves with the medical care situation by interviewing people involved.

This report is based on the analysis conducted in Japan on the result of the foregoing field study, and contains the background and objective, validity, contents of optimum scale, operating organization and maintenance system of the Project under planning.

CHAPTER 2.
BACKGROUND OF THE PROJECT

2-1 GENERAL

Geographical

Burma is located in the northwest of the Indochinese Peninsula, extending approximately 800 km from east to west and approximately 1,300 km from south to north. Total area is approximately 676,580 km^2, which is 1.8 times as large as Japan, or 1.3 times as large as neighboring Thailand. Down the middle of the country flows through the Irrawaddy River and from the river, bottomlands spread. Near the Thailand, China, India, and Bangladesh borders, i.e., to the east, west, and north of the country, the country is mountainous.

The climate of Burma varies greatly among districts; although most of the country is in the part of the tropic, the climate depends on the geographical features. The rainfall is concentrated in the rainy season, from May to October. As shown on Fig. 2-1 in Appendix, the annual average rainfall of the coastal district of the Andaman Sea or Northern mountain district exceeds 3,000 mm. On the other hand, the average for the middle basin of the Irrawaddy River, such as Pagan, is below 1,000 mm. Fig. 2-2 shows a weather graph for Rangoon and Mandalay. The graph shows climatic differences between coastal districts and inland areas. Generally, a year is divided into three seasons:

Season	Winter		Summer			Rainy					Winter	
Month	1	2	3	4	5	6	7	8	9	10	11	12

As shown in the figures, the climate of central Burma, such as Prome, Mandalay, shows high temperatures and low humidity, although the rest Burma has a tropical monsoon climate. This is one reason that the statistics for eye disease are higher in this district.

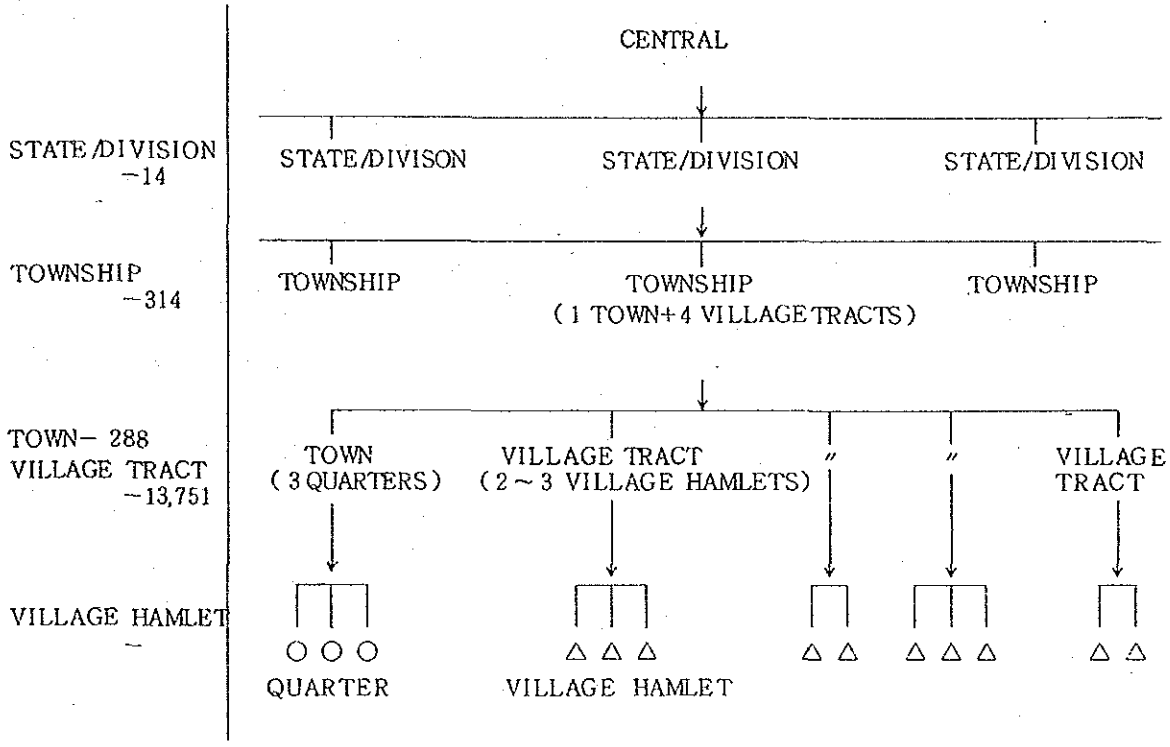
Population

The population of Burma, according to the census of April, 1983, is 35.31 million. This figure is approx. 0.7 million, or 2% higher than the previous year. The rate of increase of 2% has not changed for the last ten years. The overall population density in Burma is 52.2/km^2, which is the lowest level in Southeast Asia. But the urban population ratio is as high as 23.2%. As a whole, as much as 70% of the population is concentrated in 6 divisions located in the basin of the Irrawaddy River. From the ethnological point of view, the population consists of the Burma tribe (68%), Shan tribe (8.9%), 50 minority tribes, and Karen, Indian and Chinese peoples. Burma is a multiracial nation.

Government and Administration

The highest state body is the Pyithu Hluttaw (People's Assembly), which is a single chamber system and consists of 450 members elected from 314 townships all over Burma. As local state bodies, People's Councils are organized in each state, township, and village. The highest administrative agency is the Cabinet Council, which consists of 17 members elected from the Pyithu Hluttaw, and a prime minister and a vice minister are elected from among them. The current prime minister is U Maung Maung Kha, who has been in that position since 1977. From the Pyithu Hluttaw, 29 members are also elected to organize the Council of State and among them, a chairman and an administrative officer are elected. The chairman is the president. Since 1981, U San Yu has been in that position.

The nationwide administration organization comes in three levels; central, state/division, and township. The country is divided into 14 states/divisions; 7 divisions are in the land located around the Irrawaddy River basin where the Burma tribe live mainly, 7 states are in the peripheral areas where minority tribes live. A state consists of townships. There are 314 townships in the country. A township is further divided into cities, towns and village tracts. Generally, a township consists of a quarter and 4 village tracts. The configura-tion of the administration is shown in the following figure.



Economy and Trade

The economy of Burma is characterized by generally stagnant economic activities under a highly isolativist socialist regime. Table 2-1 shows that the per Capita GNP for 1981 is $190 and that the average annual increase since 1960 is as low as 1.4%, which is extremely low compared with the rest of the world. 47% of the GNP comes from Agriculture sector while only 13% comes from the industrial sector. Accordingly, as shown in Fig. 2-2, of 14.50 million which formed the Active Labour Force in 1983 (41% of the total population) 66% are engaged in Agriculture, Forestry, and Fishery sector, while only 9.7% are engaged in Trade Sector, and 8.3% are in Manufacturing sector. This proportion has not shown a significant change for the past ten years. These facts indicate a stagnant economy in Burma.

Imports to Burma far exceed exports, resulting in a chronic deficit. Particularly, the third four-year development plan activated foreign assistance and increased imports to Burma, causing a large chronic deficit to the amount of K35,300 million (105,900 million yen) in 1982. In this year, the balance of foreign credit also reached its highest level of $1,960 million, while the foreign currency reserve was $630 million marking the lowest level. (See Table 2-3.)

Table 2-4 describes imports. The import of capital goods, such as machinery, construction materials, occupies more than 50% of the total. The imports of raw materials and spares for inter-industry use occupies 40%. Under a suppressive policy, consumers goods are low. Imports from Japan reaches as high as 40%, while exports to Japan reaches only 10%.

2-2 MEDICAL SERVICES

2-2-1 General SITUATION

Crude death rate in 1981 was 13 per 1,000 population; infant (0-1 years) mortality rate was 98 per 1,000 live births and childhood (1-4 years) mortality rate was 12 per 1,000 children. The expectation of life at birth was 53 years (see Table 2-5). These figures shows that the health and medical conditions in Burma is lower, even compared with other countries in Southeast Asia.

Mortality Patterns

The numbers of deaths in 159 towns (there are 288 towns in the country) in 1978 was approximately 58,000. The ten leading causes of death are shown in Table 2-6. Infectious diseases such as pheumonia, intestinal infections, and T.B. occupy the top levels, similar to other developing countries. Other top items are cancer and disease of the heart. Another study conducted over 435 township hospitals in 1981 shows that the greater proportion of the ten leading causes of death were from infectious diseases. Particularly, malaria and T.B. are higher than 10%, indicating a high rate. Table 2-7 shows the distribution of death by age group in 159 towns. The death rate for children under 4 years old is 27% and the death rate for people over 55 years old is 37%.

Those two occupy 64% of the total number of deaths, which indicates a high rate in the young and old age groups. Causes of death in the lower age group include pheumonia, intestinal disease as well as birth deaths. Causes of death in the higher age group includes T.B. cancer, heart disease, and cerebral hemorrhage. A distinct difference can be seen between the two groups.

Morbidity Patterns

The single leading causes of out-patient morbidity based on 10% samples in 1981 are shown in Table 2-8. Except for supervision of pregnancy and puerperium, the main causes include ill-defined intestinal infections, bronchitis, malaria and other infectious diseases, similar to the mortality patterns. In addition to these, anaemia and helminthiasis which may be caused by protein and calorie deficiencies are included in the main causes. The single leading causes of in-patient morbidity based on 10% samples of 435 township hospitals conducted in the same year indicate malaria (14.8%) at the top followed by digestive system and respiratory system infections, excepting normal delivery. This is also similar to the mortality patterns, and unspecified abortions are also among the leading causes of morbidity.

This low conditions of health and medical services, however, is being improved through the "People's Health Programmes" (described later) these days. Yet the improvement rate is still lower than other countries in Southeast Asia and it becomes more important to correct imbalances in the medical services between urban and rural areas, as well as to improving the level of medical services over the whole country.

2-2-2 Administration for Medical Care

Ministry of Health (M.O.H.)

The health and medical services in Burma are administered by the Ministry of Health. Fig. 2-4 shows that the ministry is headed by a minister and deputy minister. The ministry consists of the following four departments each controlled by the director-general.

Name of Department		No. of staff
Ministry of Health		50
1*	Dept. of Health	41,886
2*	Dept. of Medical Education	1,859
3*	Dept. of Medical Research	347
4	Dept. of Sports and Physical Education	654
Total		44,796

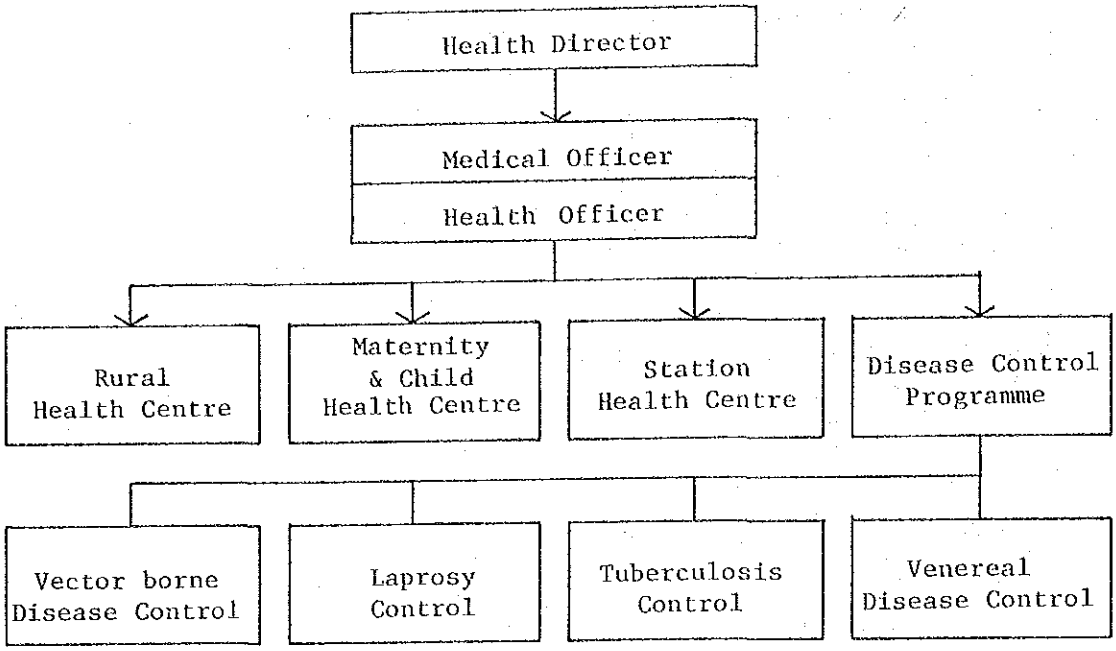
Note: * These organizations were visited during this study.
Source: Ministry of Health statistics

(1) Department of Health (D.O.H.)

This department is the center of the Ministry of Health, consisting of the following five divisions each operating under a director. A division is subdivided into 2 - 4 sections each operating under a deputy director. The department of health is the implementing organization of the Project in Burma.

1. Planning, Admini., Finance and Training
2. Medical Care
3. Public Health
4. Disease Control
5. Laboratory

Local administration of health and medical services is under a health director and structured as follows:



SOURCE: Data of Department of Health

(2) Department of Medical Education (D.O.M.E.)

This department is responsible for medical education in institutes and post-graduate schools, and training of dental technicians and school dental nurses. Detailed information is given in 2-2-5.

(3) Department of Medical Research (D.O.M.R.)

This department is responsible for supervising and promoting medical research in Burma, and training research workers. Four main fields of research are:

1. Nutrition and Nutrition-Infection Interaction Nutritional anaemia, Goitre, Growth in children, Breast milk, Weaning foods, Energy expenditures
2. Communicable Diseases Malaria, Dengue haemorrhagic fever, Intestinal infections, Viral hepatitis, leprosy
3. Other Special Areas Snake-bite, indigenous drugs, Health service research
4. Infrastructure for Research

This department comprises 13 research divisions, including bacteriology, biochemistry, and epidemiology, and research service divisions, including instrumentation and a library.

In the Department of Medical Research located in Rangoon, main buildings such as the biomedical research center building and library building were constructed by Japan's grant aid. These buildings support high level research for basic medical services in Burma.

(4) Department of Sports and Physical Education

This department is responsible for sports and fitness activities for health improvement.

Other Health-related Administrations

Other health-related administrations are described below:

- Ministry of Planning and Finance:

  Deals with international and bilateral assistance, approval and release of health budget, approval of health equipments to be purchased and the matter doaling with drug abuse control.

- Ministry of Foreign Affairs:

  Coordinates Bilateral Assistance.

- Ministry of Industry No. 1:

  Its Burma Pharmaceutical Industry produces Pharmaceutical and biological products.

- Ministry of Information:

  Its information and broadcasting department and other corporations are responsible for information services, including diasemination of health information.

- Ministry of Transport and Communication:

  It has interface with communication and transportation of medical supplies.

Budget

The following list shows the allocation of the budget for the Ministry of Health in 1982/83:

Recurrent Expenditure/Capital Expenditure

(Ks. Millions)

Department	Recurrent expenditure	Capital expenditure	Total	Percentage (%)
Ministry of Health	348.49	189.73	538.22	100.0
Dept of Health	324.18	121.76	445.94	82.9
Dept of Medical Education	11.71	14.80	26.51	4.9
Dept of Medical Research	5.87	6.37	12.24	2.3
Dept. of Sports and Physical Education	6.07	46.70	52.77	9.8

Source: Data of D.O.H.

The Department of Health where 94% of the total staff work takes 83% of the total budget for the ministry. The budget for the ministry takes 7.9% of the national budget, and per capital health expenditure is 14.77 K. (approx. 413 yen), and is slightly increasing. Of the total budget for the ministry, 90% of the recurrent expenditure is taken by personnel or service costs, and only 4.6% is taken by costs for maintaining medical equipment.

(Ks. Millions)

Details of the Budget for D.O.H. 82/83		
Items	Amount	%
Personnel	145.41	44.9
Repairs and Maintenance	14.93	4.6
Consumables and Services	147.27	45.4
Others	16.58	5.1
Total:	324.18	100.0

Source: Data of D.O.H.

2-2-3 Organization for Medical Care

The health service is conducted by the following four divisions of D.O.H. of the Ministry of Health:

Division	Service
Public Health	Public Health Service
Disease Control	Disease Control Service
Medical Care	Hospital/Medical Service
Laboratory	Research Service

These divisions are closely related to the "People's Health Programmes" and serve as its executing organization.

Public Health Services

Nationwide basic health services such as delivery provision, vaccination, and tooth decay prevention, are conducted by health centers and other institution described below:

1. Primary Health Care System
2. Rural Health Centers
3. Urban Health Centers
4. Maternal & Child Health Centers
5. School Health Services
6. Occupational Health Services
7. Environmental Health Services

Detials of the health center which plays an important role in these activities are shown in Table 2-9.

Disease Control

Communicable or non-communicable disease control is carried at the central level by the Central Epidemiological Unit of D.O.H. and at the peripheral level by the staff of Preliminary Health Care and Basic Health Services. The Disease Control Services cover the following items and each is accompanied by the cost in 82/83.

(Ks. Thousands)

Vector-borne disease control	6,048
Tuberculosis control programme	4,491
Leprosy control programme	4,542
Trachoma control programme	2,114
Venereal disease control	1,732
Epidemiological services	

Source: Report to the Pyithu Hluttaw 1984/85

Research Service

The National Health Laboratory (NHL) in Rangoon is the central reference laboratory with three divisions, viz., Public Health Division, Chemical, Food and Drug Division and Clinical Division. Besides the National Health Laboratory, the following are provided:

Laboratory	No.	Remark
Teaching/Specialist Hospital Lab.	18	located in some general and specialist hospitals in Rangoon and Mandalay.
Type A Lab.	16	located in division hospitals.
Type B Lab.	35	located in township hospitals.
Type C Lab.	87	
Type D Lab.	271	

Hospital Services

The nationwide structure of hospitals basically corresponds to the administration structure. See the following table.

Central	Teaching Hospitals	R.G.H (1500beds) M.G.H (800beds) C.W.H (800beds) R.C.H (550beds) etc,
State/Division	↓ Division Hospitals	↓ One or more General Hospitals are located in each S/D 150 - 350beds
Township	↓ Township Hospitals	↓ 150,100,50,25,or16beds depending on the scale of the Township
Village Tract	↓ Station Hospitals	↓ Less than 15beds
	Rural Health Centre	3 or 4 Rural Health Centres are located in each township. One of them may be upgraded to Station Hospital.

The teaching hospital is a top level hospital which also serves as an education institute for medical colleges or graduate schools located in Rangoon and Mandalay. The five hospitals which require medical equipment assistance this time are all of this type.

The total number of hospitals in 1980 was 514 (see Table 2-10). Of 500 hospitals under the Ministry of Health, 483 are general hospitals, and 17 are specialist hospitals. Of these general hospitals, more than 80% are small scale township or station hospitals each having less than 25 beds. A township hospital with less than 25 beds consists of an assistant surgeon and three nurses. A station hospital consists of a physician and a nurse.

Table 2-11 shows the scale of each hospital, and Table 2-12 and 2-13 show the name and scale of general hospitals and specialist hospitals by state/division. These lists reveals that the four hospital to be assisted this time (Rangoon General Hospital, Central Women's Hospital, Rangoon Children's Hospital, and Mandalay General Hospital) are all top level hospitals in Burma (New Rangoon General Hospital is excluded from the list, because it was under construction in 1980) and that more than 50% of the specialist hospitals and general hospitals with 200 beds or more are concentrated on Rangoon and Mandalay.

On the other hand, the level of the hospital service can be measured in terms of the number of beds. As shown in Table 2-14, annual average increase rates since 1950 were 6.6%, 6%, and 2.5%, indicating a rapid reduction. Especially, between 1970 - 1980, the population per bed has increased, i.e., the increase in beds cannot cover the increase in population. Comparing the population per bed in Burma with that of other countries in Southeast Asia, it can be seen that the service level in Burma is significantly low.

2-2-4 Personnel for Medical Care

Health personnel in Burma comes in two categories: hospital medical service staff, including doctors and nurses, and public health service staff (see Table 2-15). Doctors including dental surgeons can be divided into two categories: public and private. Most private hospitals employ only one doctor. The total number of doctors was 8,381 and the number of nurses was 4,607 in 1982/1983. The average increase rate of nurses was around 3 - 6%, while that for doctors was around 7%. Table 2-16 shows the number of doctors per million people. The table reveals that the number of doctors in Burma is higher than in other countries in Southeast Asia, leading to the conclusion that the service is relatively filled up in terms of the number of doctors. Table 2-17 shows the distribution pattern of manpower within the jurisdiction of the Ministry of Health and reveals the following trends:

38% of the doctors, 26% of the X-ray technicians, and 48% of paramedicals concentrate on Rangoon State (population concentration is 11%).

Dental surgeons and nurses are distributed corresponding to the population pattern. However, the overall shortage of them is one of the bottlenecks in the staffing of the health service.

2-2-5 Institutes for Medical Education

The education system in Burma consists of 5 years primary school, 4 years middle school and 3 years high school forming the basic education course. In addition to this, higher education including university and college or vacational school is provided. Medical education is within the jurisdiction of the Ministry of Health, not the Ministry of Education. Table 2-18 and 19 show institutions producing health workers by category. Further, some medical colleges are within the jurisdiction of the Medical Education Department and others are within the jurisdiction of the Health Department.

Roles of the Department of Medical Education

The department of Medical Education controls three medical colleges, one dental college, and five graduate schools for doctors (see Fig. 2-5). In this system the nursing schools are not included. Lectures in Institutes places emphasis on the development of primary health care doctors. Advanced special education is conducted as part of the graduate course in the three medical colleges and the other five graduate schools, including the public health course. The institute holds nine diploma courses (1 - 2 year), and 14 M.Sc. Courses. The courses at the three medical colleges are for four years, and at the dental college is four and a half years. The number of persons who graduate annually from the medical colleges is 450 - 500 and from the dental college is 50.

Nursing Training

From the seven nursing training schools which are under the Dept. of Health, 150 trainees graduate a year. The course is for three years after graduation from high school. From the 16 midwifery schools, 450 graduate per year, and the course is one year and a half after graduation form middle school.

2-3 National Development Plan and Foreign Assistance

2-3-1 National Plan for the Socio-Economic Development

Economic development in Burma has been based on the "New 20 years program" (specified period is 74/75 - 93/94) started in 1974. The long-term national plan is divided into five medium-term four-year plans, and the program is now in the fourth four-year plan.

After the First Four-Year Plan was abondoned due to the stagnant economy, the Second (74/75 - 77/78), and the Third (78/79 - 81/82) Plan were conducted. During these terms, the growth rate of GNP marked 4.7%, and 6.5%, respectively, which is an indication that

the economy of Burma was out of the chronic depression after the revolution. This was accomplished by over-investment and positive introduction of foreign funds, causing other problems, such as the rapid increase in the foreign credit balance, and a bigger financial deficit.

The Fourth Four-Year Plan (82/83 - 83/85) aims to attain an average 6.2% increase in the GDP with public investments of 37.1 billion K, which indicates a 50% increase over the Third Four-Year Plan. Therefore, these financial problems are likely to enlarge in the near future.

The amount of public investment in the Social Services Sector (Education, Health, Social welfare) is shown in Table 2-20. The amount in 1983/84 decreased 0.6% compared with previous year, while the Social Services Sector makred a 30.4% increase, and occupies 7.7% of the total public investment. As shown in the table, the Health Division in the Social Services Sector receives 29% of the original allotment of K.583.5 million, or 2.1% of the entire public investment budget of 1983/84. The amount of actual investment in the Social Services Sector in 1983/84 was K.628.7 million, which was an 8% increase over the expected investment. The increased expenditure was due to the construction of Nurses Training Center, the construction of Youth Training Center, implementation of the School Textbook and Exercise Book Development Project (both financed by Japan's grand aid) and completion of the construction of Indoor Stadium I (financed by the People's Republic of China loan).

Social Sector Public Investment Budget in 1983/84

Sector	Budget (Ks. Millions)	(%)
Education	275.6	47
Health	168.7	29
Social Welfare	139.2	24
Total:	583.5	100

Source: Burma Annual Report (1984)

2-3-2 Health Development Programme

The health development programme in the national plan for the economic develoment of Burma has specified goals and budget allocations within a frame of the four-year plan. The Health component of the four-year plan is prepared in the Division of Planning, Finance, Administration and Training (P.F.A. division) of the Department of Health, after consultations within the central level.

National Health Policy

The National Plan for the Economic Development of Burma has the following health sector policies based on the Health Policy Guidelines laid down by the Burmese Socialist Programme Party:

(1) To raise the health standards of the working peopole and to provide efficient treatment for all diseases within the country.

(2) To give priority to preventive measures.

(3) To narrow the gap between rural and urban areas in the availability of health services.

(4) To establish more hospitals, dispensaries and rural health centers.

Health Development Programme

After the CHP exercise, there came into existence the Developmental Programme (as identified by Country Health Programming), and regular programs of the Health Services in the country. The developmental programs consisted of four service projects and four support programs. The regular programs are those which existed before the CHP exercise was carried out and are continuing at present, viz;

1. The Hospital Services
2. Central Epidemilogy Unit
3. Tuberculosis Control Programme
4. Anti-VD Programme
5. Leprosy Control Programme
6. Trachoma and Blindness Control Programme
7. Occupational Health
8. Nutrition
9. Health Education Work, etc.

People's Health Programmes (P.H.P.)

After the first People's Health Programme based on the C.H.P. in 1976 the second People's Health Program was determined in 1980 and is now in effect. The term is scheduled from 1982 to 1986 which is the same as the fourth four-year plan, and is the core of the health policy in Burma. This programme consists of the following four services and four support programmes.

1. Community Health Care Programme
2. Hospital Care Programme
3. Disease Control Programme
4. Environmental Health Programme
5. Support Services Programme
    1) The Laboratory Service
    2) Health Education
    3) Health Manpower Development

4) Production, Supply Logistics, Maintenance and Repair Services

Each service has the following objectives:

(1) Community Health Care (CHC) Programme

o Objectives

To expand the functional coverage and quality of community health care giving priority to mothers and children. To expand village coverage of primary health care by midwife, community health workers, traditional medicine practitioner, from 30 to 46% and Maternal and Child Health Care by midwife/Auxiliary Midwife of Traditional Birth Attendants from 80 to 100% at the end of 1986.

(2) Hospital Care Programme

o Objectives

Provision of adequate and essential medical care for prevailing diseases and injuries in order to prevent or reduce the loss of production potentials of the citizens.

o Strategies

1. Expansion of total bed strength for hospital care to alleviate the shortage as population increase.
2. Improvement of the quality of hospital care services.
3. Development of an equitable communication and referral system.
4. Development of special care services dealing with emerge health problems.

(3) Disease Control Programme

o Objectives

To strengthen the existing epidemiological surveillance activities for early diagnosis, reporting and notification of the communicable diseases including diseases aimed at early recognition and timely prevention, control and treatment of diseases by appropriate measures.

To expand the immunization activities to 72 townships, during the planned period 1982 - 86, covering 80 percent of the specific population groups in these townships.

To expand the activities related to vector-control and vector borned discase so as to reduce morbidity and mortality due to Malaria, Dengue Haemorrhagic Fever, Japanese Encephalitis and Filariasis.

(4) Environmental Health Programme

o Objectives

To oincrease the percentage of population served by safe water supply from 22% in 1981 - 82 to 35% in 1985 - 86 in rural areas.

Details of the budget required by the Ministry of Health indicates that 63% of the total amount is allocated to hospital services, and 23% to the community health care program. These services are the center of the programme.

2-3-3 Trends of Foreign Assistance

The government of Burma started to introduce foreign assitance positively at the establishment of the civil administration in 1974. In 1978, two years after the formation of an assistant country group, 1976, the amount of foreign assistance for national development in Burma reached $273.8 million, a 170% increase over the last year. The cumulative amount in the period 76 - 82 was $1,721.8 million. 41% of the total amount is shared by Japan, 12% each is shared by IDA (International Development Association) and West Germany, and 9% is shared by ADB (Asian Developmet Bank). Japan is leading benefactor of Burma, but the amount has been decreased since 1980 to 33% in 1982.

The mining and manufacturing industries and infrastructures (transportation, communications, power, water-supplies and others) are the main objects for assistance.

The amount of assistance from Japan, 1976 - 1982 is $711.7 million and the ratio of grant aid to credit is 1 to 3. Credit is used for oil or gas development, and plant construction, i.e., project credit. Grant aid is used mainly for social sector, i.e., health/medical care, education, public facilities, etc.

For medical assistance, Japan also shares the largest part. This medical assistance includes the construction of the Biomedical Research Center. 1975 - 78 (3,500 million yen), the construction of a pharmaceutical manufacturing research center, in 1980 (2,000 million yen), the construction of the New Rangoon General Hospital 1981 - 82 (3,500 million yen), and the construction of Nursing Training Center 1983, (1,890 million yen). In addition to these, assistance covers technical assistance, including receiving trainees, dispatch of advisors, and medical assistance. In 1979 grant aid for medical equipments of 600 million yen was given to the both Rangoon and Mandalay General Hospitals.

During the study of each hospital, medical equipments located with assistance from UNICEF, Canada, or West Germany were found. Although the assistance of the United Nations including UNICEF is systematic and well-scheduled, the emphasis is placed on local health activities such as materials and personnel, rather than medical equipment. On the other hand the bilateral assistance offered by European Countries is small in scale and lacks any schedule, and is mainly materials supply. Only Japan is providing aid for the construction of facilities and technical assistance on a wide and consistent basis.

Recently, the Asian Development Bank announced the construction project of a general hospital with 660 beds and a medical school, and also released a plan of a large-scale medical equipments supply for peripheral hospitals. The United States has started assistance in 1980. Assisting countries are becoming diversified today.

CHAPTER 3.
THE CONTENTS OF THE REQUEST

The Government of Burma has requested Japan's assistance for the Project to medical equipment which involves Linear Accelerator, Whole Body CT Scanner, Artificial Kidney Units, Auto-Analyzer Systems for Clinical Laboratory, Ultrasonic Diagnostic Equipment, Apparatus for Cardiovascular Function Tests, Patient Monitoring Systems, Sterilizer Units, Microscopic Equipment and Instruments for surgical operation. Thus, the Project covers a wide range of medical equipment from that which requires very minute care and a high level of technology to the normal equipment for daily use and medical mobile units.

3-1 The Contents and Purpose of the Project

The contents and purpose of the Project requested by the Government of Burma are explained hereafter according to the priority of the requests.

(1) New Rangoon General Hospital (220 beds)

It requires a Whole Body CT scanner for gastroenterology, a Gamma Counter to diagnose liver troubles and measure HB antigen antic bodies and hormones of various digestive organs, and a Gamma Counter for Scintigram of the liver, pancreas and gall passage in order to improve on diagnosis of digestive diseases in Radiology. The requested equipment are essential to accomplish the initial objectives of the hospital.

(2) Rangoon General Hospital (1,500 beds)

Equipment for use in the Radio Theraphy Department, Clinical Laboratory, Cardiology, Surgery (Neuro Surgery, Oral Maxillo, Facial & Plastic Surgery, Uro Surgery and Chest Surgery), Dental Department and Operation Room is requested.

(2)-1 Two Covalt 60 are used in the Radio Theraphy Department now to treat more than 100 patients a day. A Linear

Accelerator has been requested to treat more patients. Space for the equipment has been prepared and the construction to prevent X-ray leakage has already been finished.

(2)-2 The Clinical Laboratory has various fundamental test equipment, however, it does not have any Analysis Units which are highly precise and operated automatically. The Analysis Units for Clinical Chemistry Tests, Hematology Tests and Immuno-serology Tests are needed to analyze more tests and contribute to early treatment through accurate diagnosis.

(2)-3 The Cardiology requests a Angiocardiography System to do cardiac catheterization, cardiac intra cavity tests and coronary angiography for cardiac disease (apriority or acquired), and Apparatus for Cardiovascular Function Test Unit, Holter Electro-cardiograph Unit and Monitoring Systems to do cardiac load tests, find irregular pulse at the time of attack, diagnosis angina pectoris and determine daily programs in rehabilitation for those who suffer from cardiac disease.

(2)-4 Two doctors who studied high technology and theory at Tokyo University for 20 years now work in the Neurosurgery with its own operation room.

The treatment breakdown is 40% for brain injuries, 30% for brain tumors and 10% for ameurysm and other brain abscesses. There are an especially great number of infant patients with anterior encephalosis (an organic disease of the cerebrum having degeneration which occurs peculiarly in the districts of Thailand, Vietnam and Burma). To perform craniotomy on these patients quickly and accurately, and complete intensive care, an Operating Microscope, Microsurgical Instruments, After Operation Patient Monitoring Systems including an Emergency Resuscitator and a Surgical laser and so forth are requested.

(2)-5 The Surgery Department requests replacement of basic medical equipment, mainly operating equipment, which are too old to use, limited in number or not actually possessed, to support their daily diagnosis activities. The requested replacements include Endoscopes, Operating Room Lights, Operating Tables and Electrosurgical Units. In addition, Air Conditioners, Boiling Sterilizers and Electric Suction Units for the Surgical Ward are included.

(2)-6 The Dental Department for outpatients requests diagnostic and treatment equipment such as Dental Treatment Units to replace for old equipment. Automatic Ventilators and 4 Anesthesia apparatuses are greatly needed in the general operation rooms.

(3) Central Women's Hospital (800 beds)

To improve and expand the hospital facilities to oeprate as a center for women's disease treatments in Burma, it requests medical equipment related to Intensive Care Units for new-born babies who are born with abnormalities, Incubators to monitor premature babies, Surgical Instrument for women's operations, Electrosurgical Units to stop bleeding during operation, Cryo-surgical Equipment used to treat metrelcosis and uterus erosion and so forth, Medical Equipment to check pregnant women and embryos, and Test Equipment for histopathology of general women's diseases to replace the conventional equipment in the Delivery Rooms, Newborn Baby Room, Operation Rooms, Anesthesiology Department and Clinical Laboratory. Peculiarly an Operating Microscope for microsurgery operations of tuboplasty and a Closed Circuit TV System for medical education are requested.

(4) Rangoon Children's Hospital (550 beds)

There are few intensive care units for premature babies in this hospital though it is a center of children's hospitals

and this problem must be solved quickly as Burma has a high infant death rate. Patient Monitoring Systems, Ventilators, Electrocardio-graphs, Defibrillators, Resuscitators, Inculators including an Oxygen Analyzer, Blood Gas Analyzers to check patient's respiration by measuring acid-base balance, PO_2, PCO_2 of blood, and a Plasma Exchanger and an Artificial Kidney Unit are requested.

(5) **Mandalay General Hospital (800 beds)**

Considering the current status of hospitalization and treatment, this hospital is lacking in medical lequipment. To solve this problem, the plan is formulated to improve and expand the medical equipment mainly for the following five departments: The Uro-Surgery, the Chest-Surgery, the Geneal Surgery, the Internal Medicine, the Clinical Laboratory and the Obstetrics and Gynecology.

(5)-1 Fibre-Optics to perform endoscope tests and Electro-surgical Units are requested by the Uro-Surgery.

(5)-2 Fibre-Optic for biopsy and Suction Unit are requested by the Chest-Surgery.

(5)-3 Fibre-Optics for endoscope test of gastroenterology and a Locker for endoscope are requested by the General Surgery.

(5)-4 Ultrasonic Diagnostic Equipment in Cardiology and D.C. Defibrillators are requested by the Internal Medicine Department.

(5)-5 The same equipment requested by Clinical Laboratory at Rangoon General Hospital is requested by Clinical Laboratory at this hospital though the requested amount is different.

(5)-6 Suction Units for Obstetrics and Gynecology, Resuscitators and Physician's Office Scales which are fundamental equipment are requested by the Obstetrics and Gynecology.

* The locations of the above five hospitals in Rangoon and Mandalay are shown in Fig. 3-1.

(6) **Development of ICU & CCU at the Strategically Located General Hospitals**

Patient Monitoring Units, Ventilators and Cardiac Resuscitators requested to expand the equipment to monitor serious cases, manage respiration and perform emergency treatment. The five general hospitals are Taunggyi General Hospital, Bassein General Hospital, Moulmein General Hospital, Akyab General Hospital and Magwe General Hospital. (Fig. 3-2)

(7) **Development of Dental and X-ray Mobile Services**

The People's Health Programs applies to the expansion of Community Health Medical Care along with the expansion of hospital medical work. The purpose is to provide mobile dental treatment including oral hygiene guidance. The mobile unit is 4WD and to be equipped with an Air Router, a Scaler, a Dental X-ray Unit, Suction Apparatus and a Generator to operate the equipment. Japanese authorities may choose to provide dental instrument as well. These units will be set up in the 5 cities of Taunggyi, Bassein, Moulmein, Sittwe (Akyab) and Magwe. (Fig. 3-2)

(8) **Prosthetic/Orthotic Services - Community Program for Disability Prevention and Rehabilitation Project**

The establishment of a National Institute for the Physically Handicapped (120 to 160 beds) including medical equipment and a residence for those who are engaged in medical care in Rangoon are requested.

- The establishment of a Rehabilitation Hospital (50 beds) including medical equipment and a residence for those engaged in medical care in Mandalay.
- The establishment of Rehabilitation Hospitals (16 beds) in Mitkina, Monywa, Lashio, Taunggyi, Meiktila, Magwe, Prome and Moulmein.

- Long-term or short-term technical instruction for physical therapists and rehabilitation therapists.
- Ambulances which are to be supplied to the above hospitals.

This project does not detail the requests for all equipment. (Fig. 3-3)

(9) Development of Kidney Unit in Rangoon General Hospital

Artificial Kidney Units to treat those who suffer from chronic renal insufficiency, acute renal insufficiency, dropsical swelling and nephritis, a Scale Bed to check the weights of the patients before/after dialysis, a Dialysis Bed, a Water Softener Unit using the iron exchange resin method and a Water Strainer for water treatment are requested. All these treatments are for temporary recovery of renal function, in particular for social rehabilitation of patients in their productive years. (Fig. 3-1)

(10) Essential Equipment and Instruments for Ophthalmic Mobile Surgical Unit

This is requested to expand the Toracoma and Loss of Eyesight Counterplan involved in Regular Programs of People's Health Programs in making early checks and diagnosis of eye diseases occuring in the middle and southern parts of Burma. This plan will make it easier to provide ealry checks and timely diagnosis in the rural provinces where residential areas are far from medical centers.

The Ophthalmic Mobile Unit may be equipped with fundamental ophthalmic medical equipment, a portable sterilizer and a generator and operating instrument for entropion, glaucoma and cataract. 16 doctors and 20 nurses will be engaged in this Project using 4 mobile units based at divisional hospitals in Mandalay, Monywa, Maiktila and Pegu and at sub-divisional hospitals in the surrounding area. (Fig. 3-4)

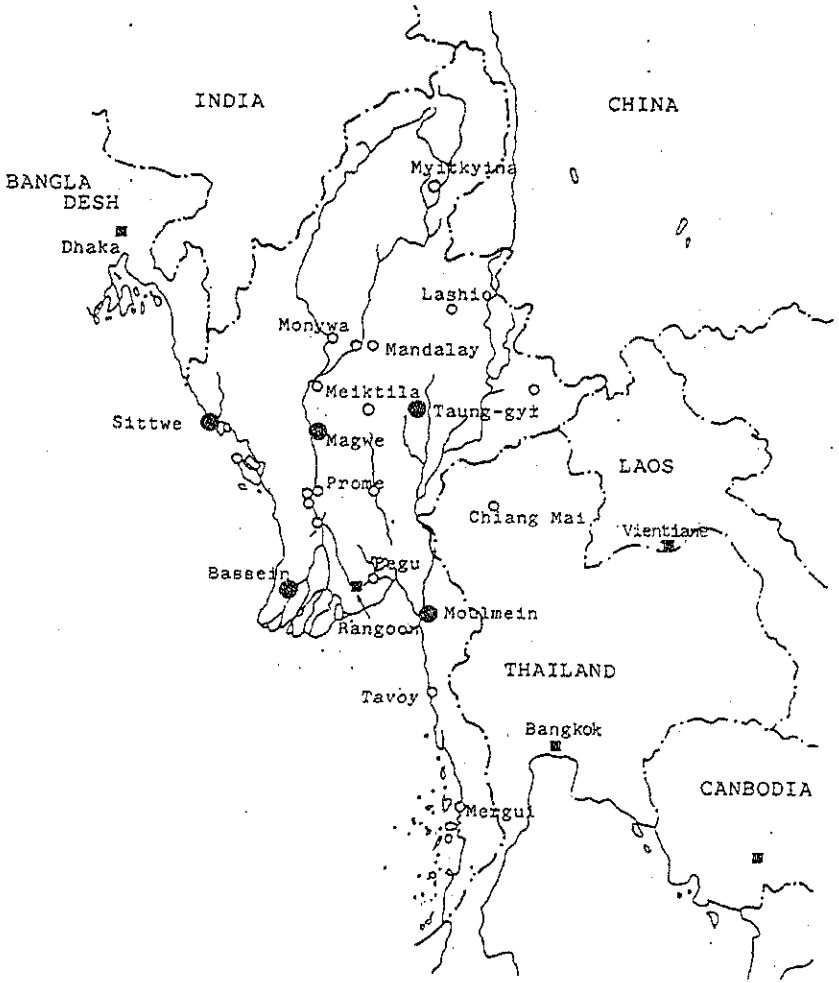


Fig.3-2 (6)ICU,CCU Development Project Sites
(7)Dental & X-Ray Mobile Units Project Sites

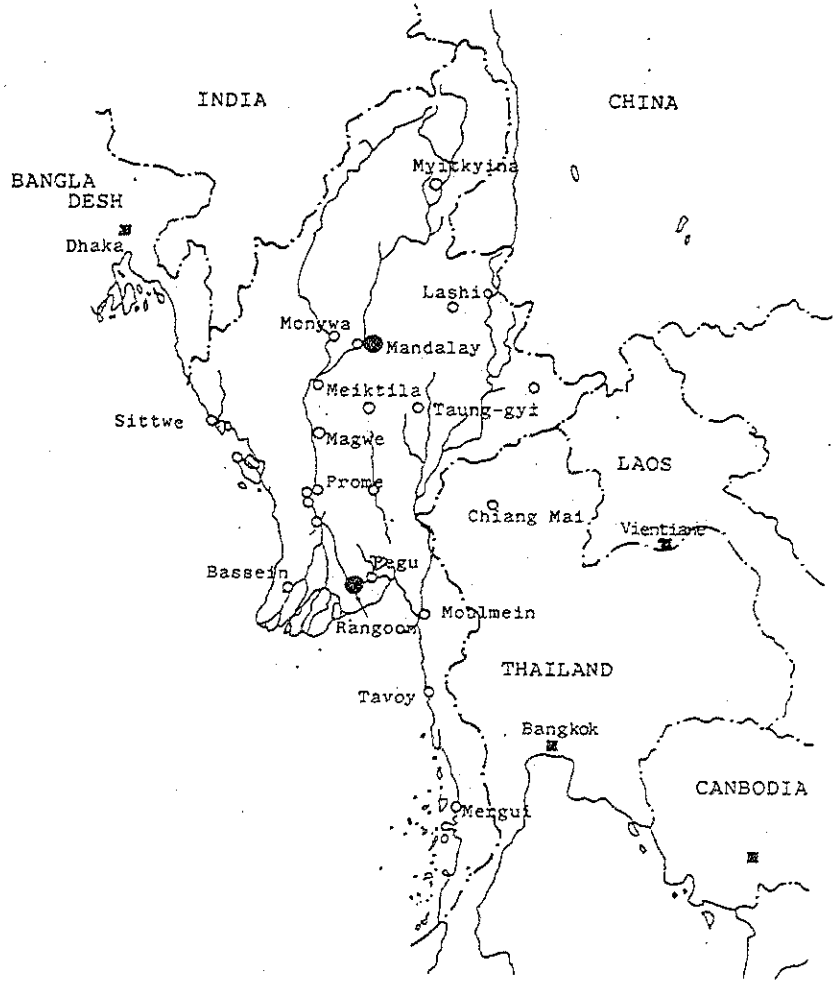


Fig.3-1 (1),(2),(3),(4),(5) Each Hospital Location
(9) Kidney Unit Project Site (in R.G.H)

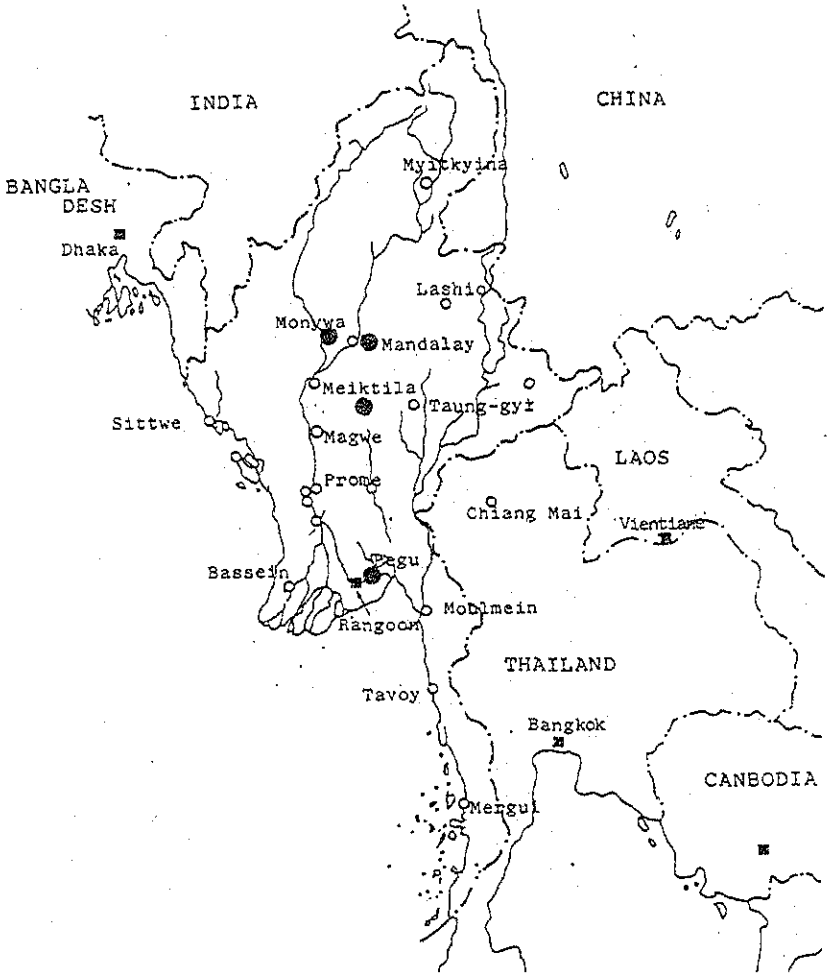


Fig.3-4 Ophthalmic Mobile Units Project Sites

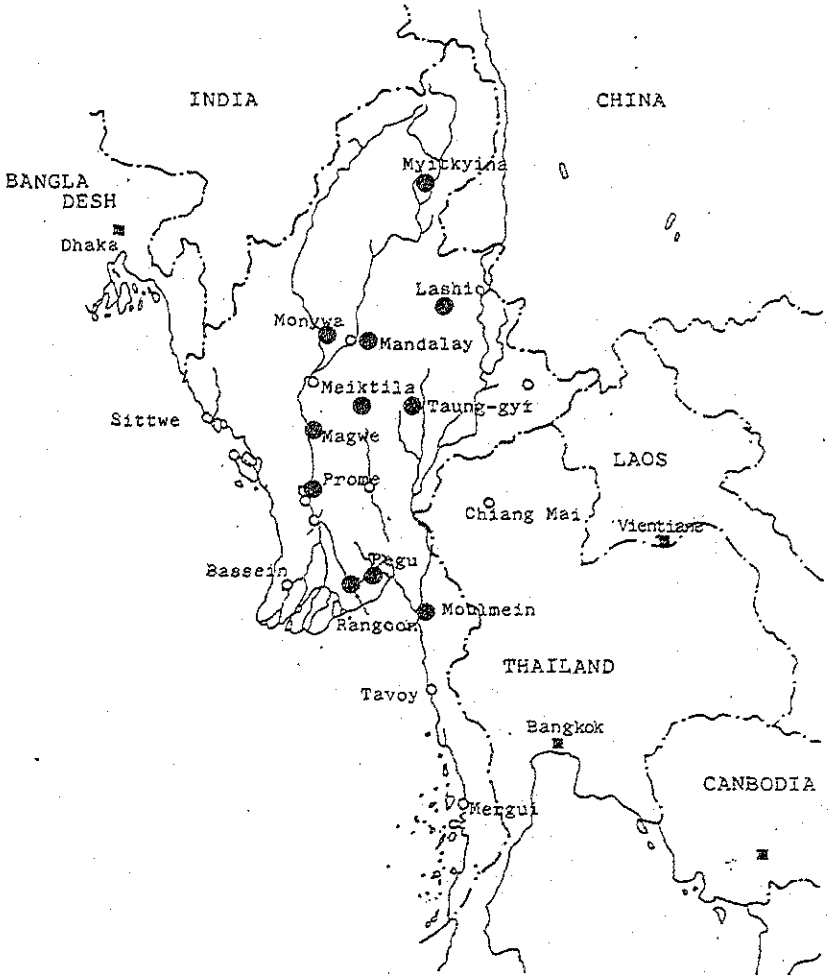


Fig.3-3 (8)Disability Prevention & Rehabilitation Project Sites

3-2 The Role of the Project in the People's Health Programs

Improving Hospital Medical Care as part of the Hospital Care Program of the People's Health Programs in accordance with the Country Health Programming advocated by the World Health Organization is the primary goal of this Project. Medical equipment has been rapidly modernized and the technical ability of those engaged in medical treatment has been improved. The purpose of this Project is to facilitate accurate diagnosis and quick treatment for people with disease and injury by supplying necessary and sufficient medical equipment to decrease national losses by disease and injury, and thereby contribute to the welfare and health of the people.

3-3 Outlines of the Hospitals under the Project

New Rangoon General Hospital, Rangoon General Hospital, Central Women's Hospital, Rangoon Children's Hospital in Rangoon and Mandalay General Hospital in Mandalay, these 5 hospitals have been chosen for the project.

The outlines of each hospital are as follows:

3-3-1 New Rangoon General Hospital

It was constructed with a Japan's Grant Aid Assistance and has 220 beds. It includes a 4 story building for outpatients and wards 2 story buildings for the X-ray, operation theater, and for Laboratory, etc.

It is considered a teaching hospital, diagnosis center and general hospital, putting emphasis on gastroenterology.

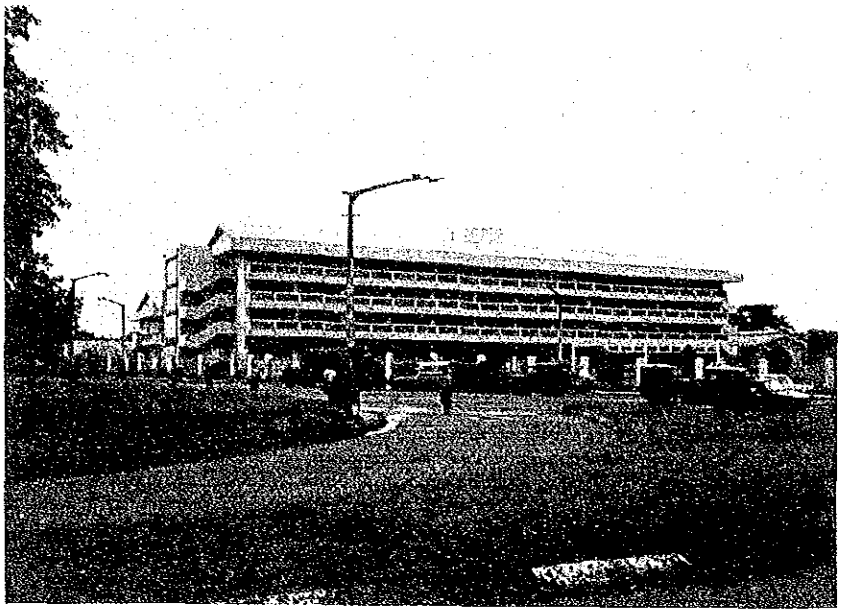
It had not yet opened when the study team visited in August, 1984, though it was due to open in March of the year. The staff will include 60 doctors and 40 nurses.

The functions of this hospital consist of 1. administration division, 2. outpatient treatment division, 3. ward division, 4. central treatment divisions (X-ray Division and operation), 5. laboratory and special care divisions (Clinical Pathology and ICU).

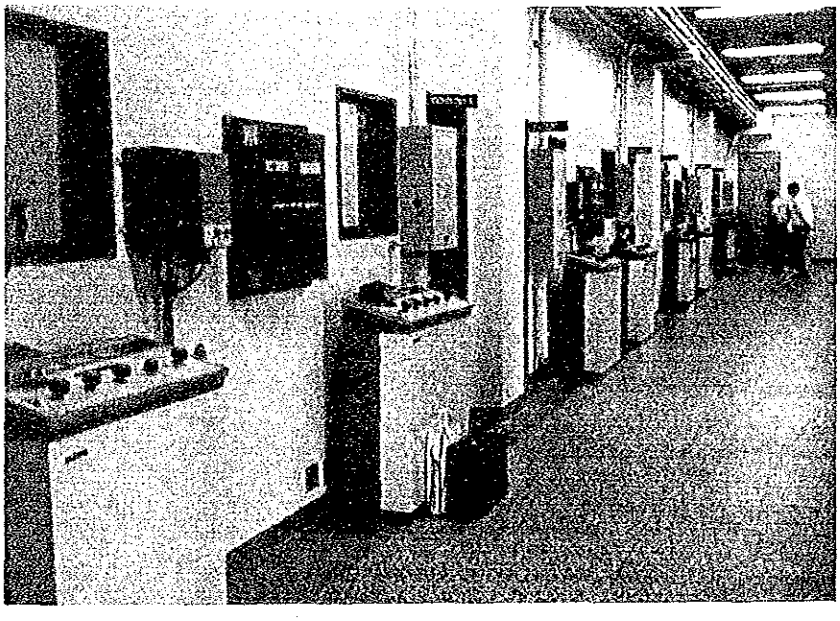
The project proposal is for the X-ray diagnosis department and the clinical pathology department, with an emphasis on X-ray, RI diagnosis and laboratory functions, mainly in the nuclear medicine which had been left as a future plan at the time of its basic design.

3-3-2 Rangoon General Hospital (R.G.H.)

It is the largest general hospital in Burma with about 60 buildings including wards with 1,500 beds and residences for hospital workers. The hospital is located at two sites divided by BOGYO AUNG SAN street, and is also the largest teaching hospital in the country. Following the construction of the New Rangoon General Hospital, which has been already completed, the project of a new hospital (including a medical school) with 660 beds is planned at the old-jail site through funds from the Asian Development Bank.



External view of New Rangoon General Hospital



Control corridor of the X-ray dept.

(1) Main Index

- Number of inpatients: 39,189/year
- Number of inpatients: 1,678/day
- Number of outpatients: 691/day
- Staff

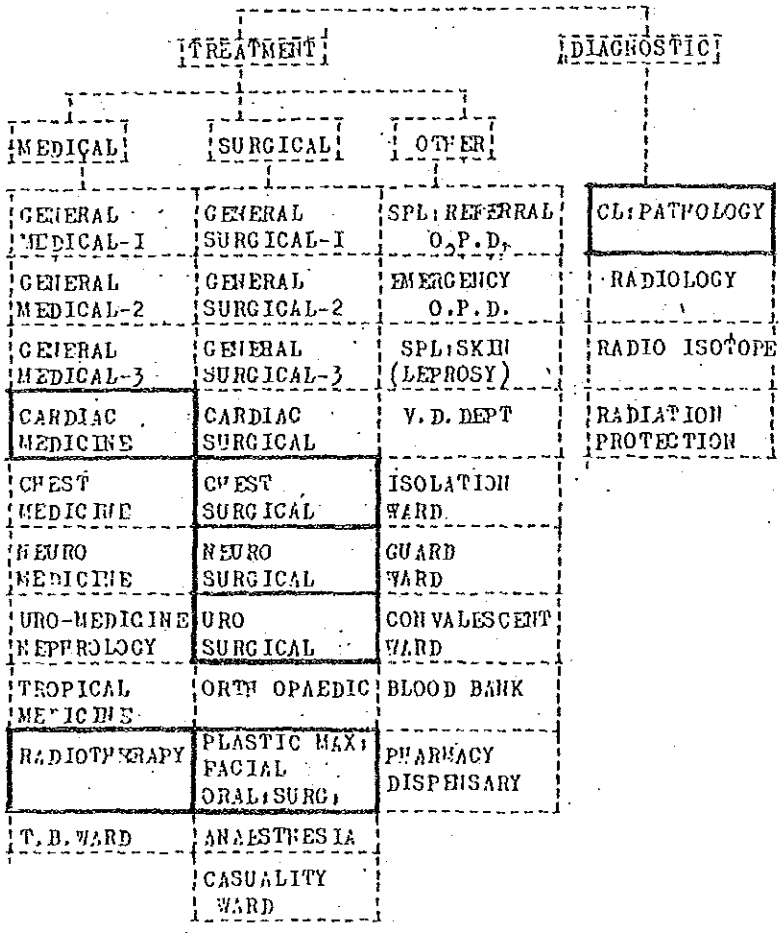
• Medical Superintendent:	1
• Deputy Medi al Superintendent:	2
• Physicians:	9
• Dentists:	2
• Other specialists:	15
• General assistant doctors:	126
• Live-in surgeons:	70
Total:	(237)
• Nursing Superintendent:	1
• Assistant Nursing Superintendent:	1
• Sisters:	27
• Staff Nurses:	60
• Trained Nurses:	230
• Trainees:	340
• Nurse Aids:	27
Total:	(686)
• Technicians:	134
• Clerical Staff:	80
• Workers:	660
Total:	(874)

· Budget (1984 - 85 budget allotment)

		Kyats
1.	Pay and Allowances	58,50,000
2.	Travelling Allowances	35,000
3.	Expenditure on Purchases of goods wages and services	23,70,800
4.	Maintenances of buildings and equipment, etc.	10,20,850
5.	Transfer Payment	2,000
6.	Entertainment, Expenditure	1,000
	Total:	92,79,650

· Organization of the hospital

The overall organization is shown in Appendix 3-1. The composition of the Treatment and the Diagnostic Dept. is as follows:



The departments enclosed by squares presented requests. Appendix 3-1 shows the treatment results of these departments and so forth.

(2) Infrastructure

The water is supplied by the Municipal Corporation to each building, using a overhead water tank.

The flow capacity and the amount of water are not satisfactory at all since the pipe is corroded and fur forms in it.

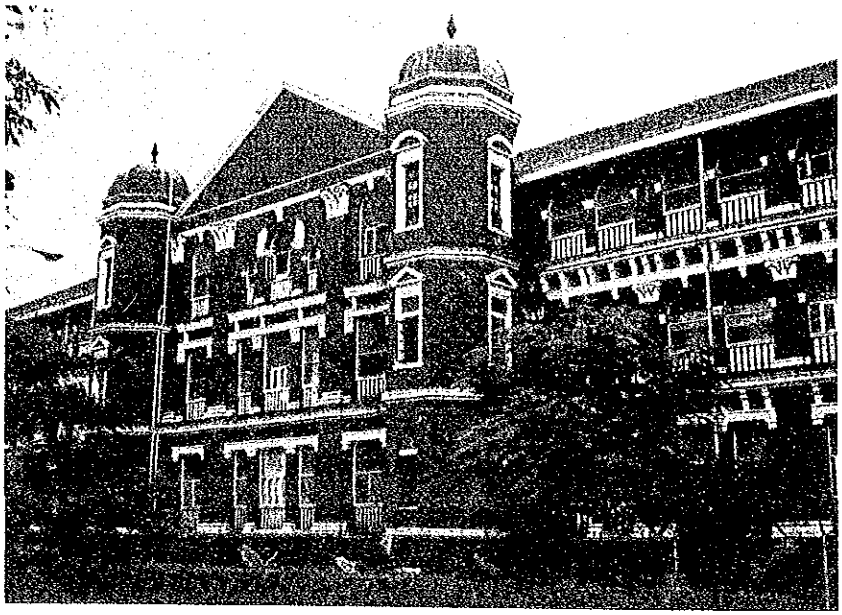
Water is not filtered nor sterilized and pure water is not produced.

The power conditions of each department is shown as follows:

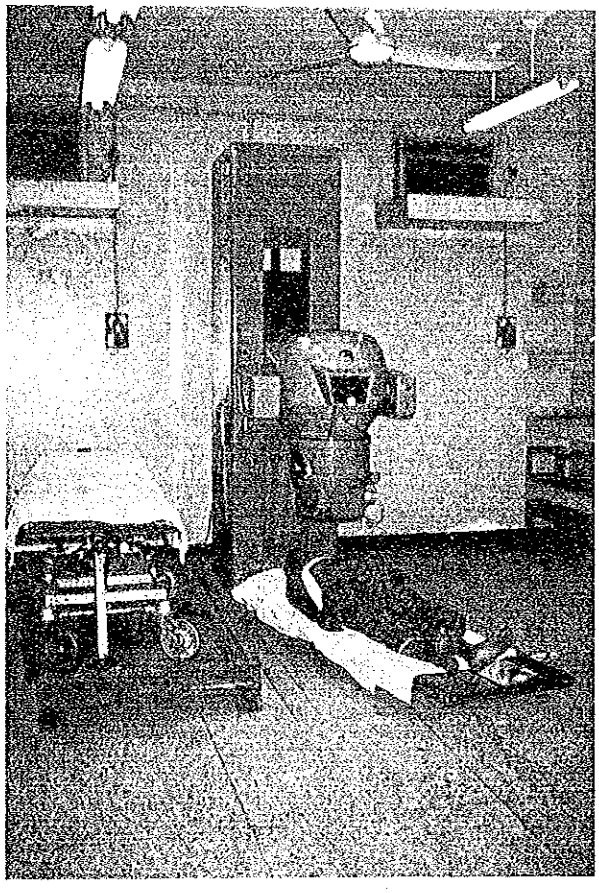
Department	Motive Power Line	General Line	Emergency Power supply
Radio Isotope	3ø-400V.25KVA	3ø-400V.35KVA	-
Radio Therapy	-	3ø-400V.50KVA	-
Uro-surgical Ward	1ø-230V.5KVA	3ø-400V.40KVA	1ø-230V.5KVA
X-Ray	3ø-400V.150KVA	3ø-400V.150KVA	-
Cardiac Medical	3ø-400V.25KVA	3ø-400V.30KVA	-
Neuro-Surgical Ward	-	3ø-400V.60KVA	-
Microbiology	-	3ø-400V.40KVA	-
Hematology	-	3ø-400V.30KVA	-

In general, the Motive Power Line is 3ø-400V and the General Line is 1ø-230V based on the British standard.

The older the hospital is, the worse the power condition is. The electric current is interrupted several times a month in



External view of R.G.H



Radiotherapy Dept. of R.G.H

Rangoon and the General line has a voltage drop between 180V and 220V. Except for Uro-surgical, there is no emergency line, air conditioners are fixed on the windows and many of them are out of order while the air conditioner is of the central supply type only in the Cardiac Ward with CCU. As for the protection of the rooms equipped with X-ray equipment, only the control-box is enclosed by concrete walls (many control windows have no glass), however, the windows and doors are not shielded.

Most of the doors facing corridor used as waiting rooms are left open because some of air conditioners are out of order.

3-3-3 Central Women's Hospital (C.W.H.)

Central Women's Hospital, facing Mission Road in the center of Rangoon, was founded in 1898. Since then, wards and treatment wards have been extended and there are about 10 out-buildings including worker's residences. It has also the role of a teaching hospital for students of Institute of Medicine and others.

(1) Main Index

- Average number of outpatients: 189/day
- " " : 5,670/month
- Number of beds

Adult	- Obstetrics:	310	
	- Gynaecology:	240 beds	Total: 550 beds
Infants	- Normal:	150 beds	
	- Special:	100 beds	Total: 250 beds
	Total sum:		800 beds

- Operations: 16/day, 346/month
- Number of operating theaters

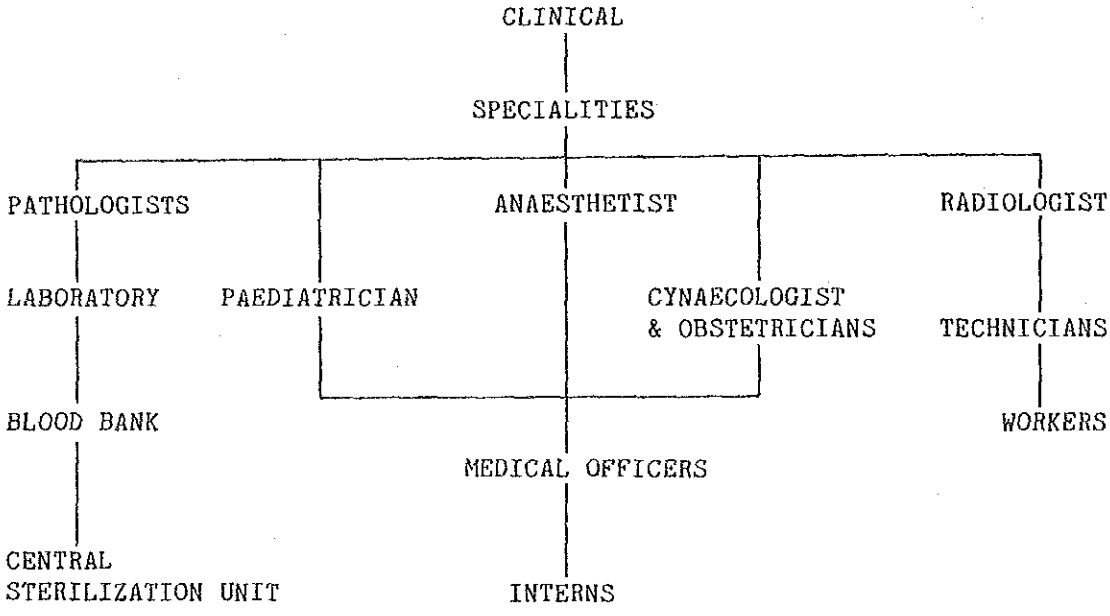
Operating theaters:	4
Delivery rooms:	6

· Staff

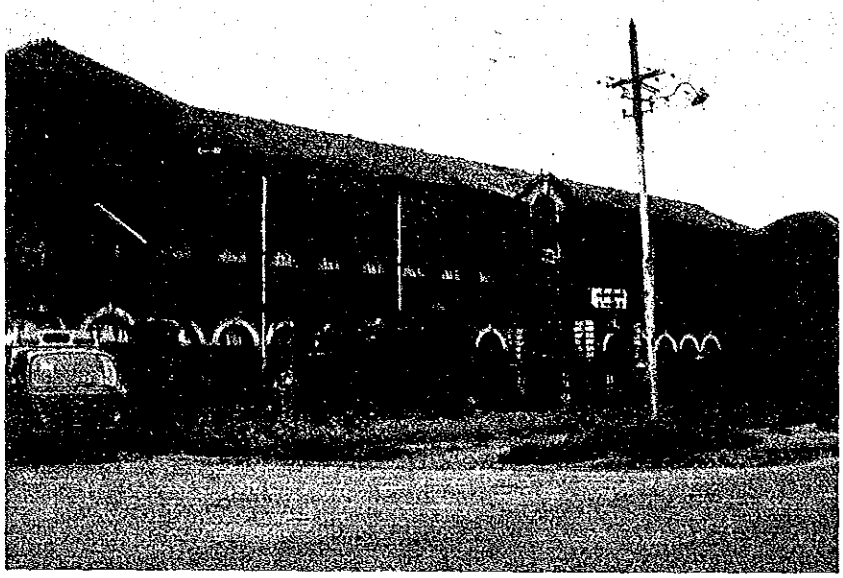
Doctors:	56
Nurses	138
Technicians	24
Administrators	4
Others	255
Total:	477

· Organization of the Hospital

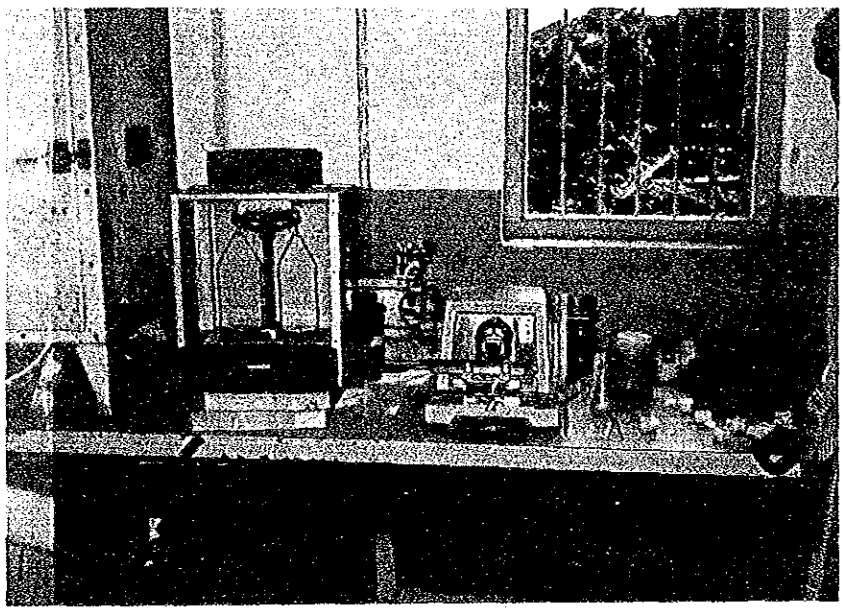
Appendix 3-2 shows the overall organization of the hospital, but the composition of the Clinical department as follows:



Main diseases, operations and the staff in each department are shown in Appendix.



External view of C.W.H



Clinical Pathlogy Dept. of C.W.H

(2) Infrastructure

Well water is supplied to an underground water tank and pumped up to two overhead water tanks. Water filters are installed. However, the water is not sterilized. The power supply is 6,600V which is converted to 3ø-400V · 200KVA and 1ø-220V · 200KVA and the emergency power generator is 3ø-400V · 32KVA, 1ø230V · 32KVA.

3-3-4 Rangoon Children's Hospital (R.C.H.)

Rangoon Children's Hospital is located to the north of the Women's hospital on the other side of a railway running between the two. It was established in 1978, separated from the Women's hospital and the building is a 5-story reinforced concrete structure. This hospital is also used as a teaching hospital for medical students and nurses. It is the only children's hospital in Burma for children with very serious diseases.

(1) Main Index

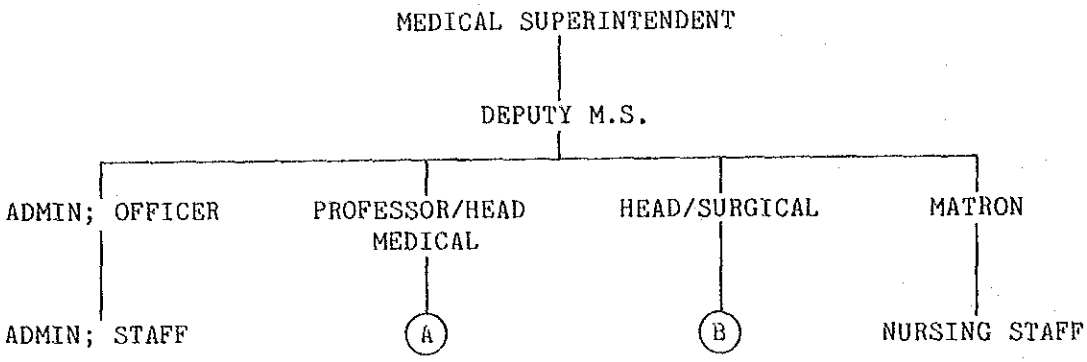
- No. of beds: 550
- No. of outpatients: Avrage 343/day, 10,297/month
- Operations: 20/day; 400/month
  All major operations including neonatal surgery except cardiac and neurosurgery.
- No. of staff:

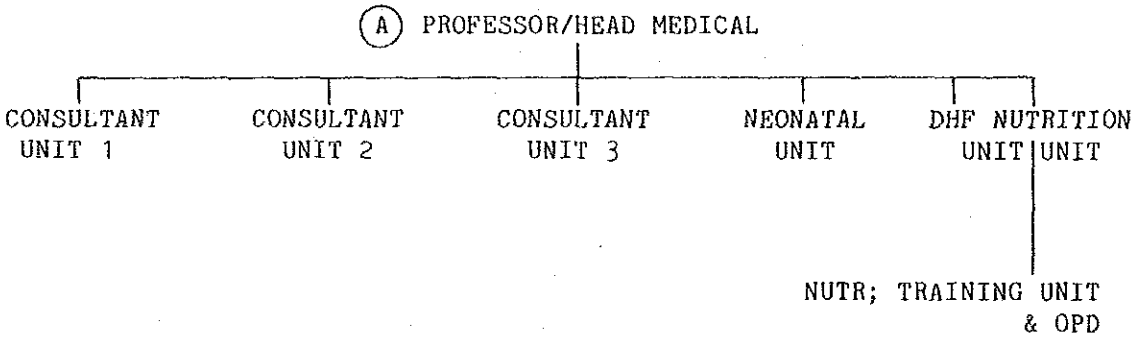
Doctors:	49		
Nurses:	134		
Technicians:	19		
Administrators:	15		
Others:	219	Total:	436

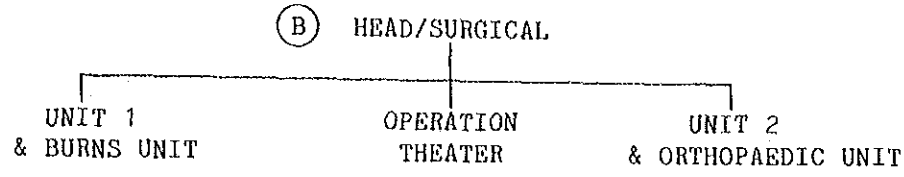
· Budget (1983 - 84 Budget allotment)

		Kyats	%
1.	Pay	1,693,000	70.4
2.	Maintenance	277,800	11.6
3.	Others	433,900	18.0
	Total:	2,404,700	100%

· Oeganization of the hospital







· Disease patterns and others are shown in Appendix 3-3.

(2) Infrastructure

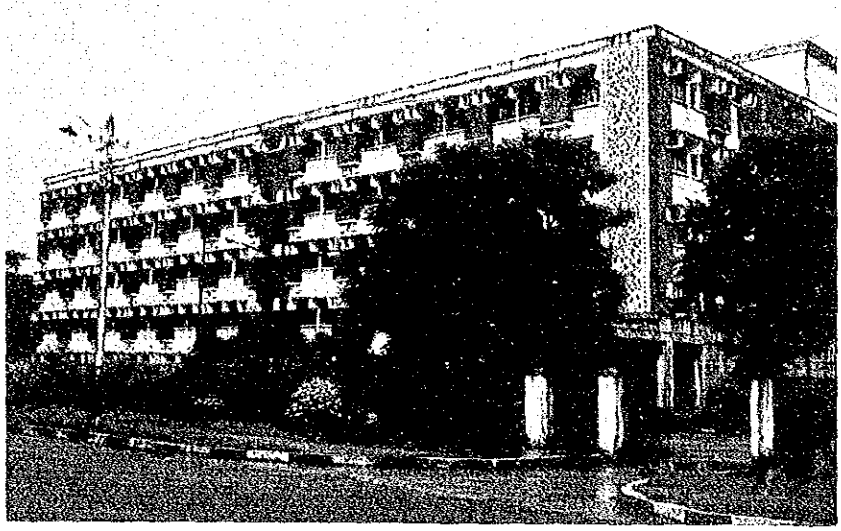
Water is supplied from the well, using an overhead water tank. However, it is not filtered nor sterilized. Also, drainage is not disinfected or neutralized.

The power capacity is 3ø-400V, 500KVA and 1ø-230V, 500KVA and the emergency power supply unit (diesel generator) has a capacity of only 1ø-230V, 5KVA.

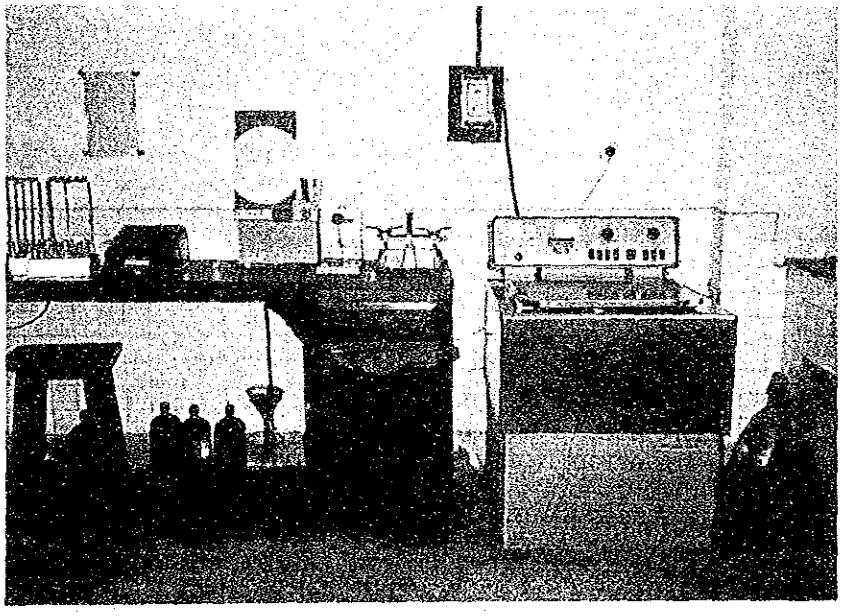
Air conditioners are only fixed in the X-ray room, Telephone room and Operation Theater Rooms independently.

The first plan for the ICU was not acceptable as it would have had a passage through it. A meeting was held and the plan was then modified to install the ICU at the end of the passage. There may be some difference in thinking on the ICU.

Figure 3-5 shows the locations of principal hospitals in Rangoon including the above 4 hospitals.



External view of R.C.H.



Clinical Pathology Dept. of R.C.H.

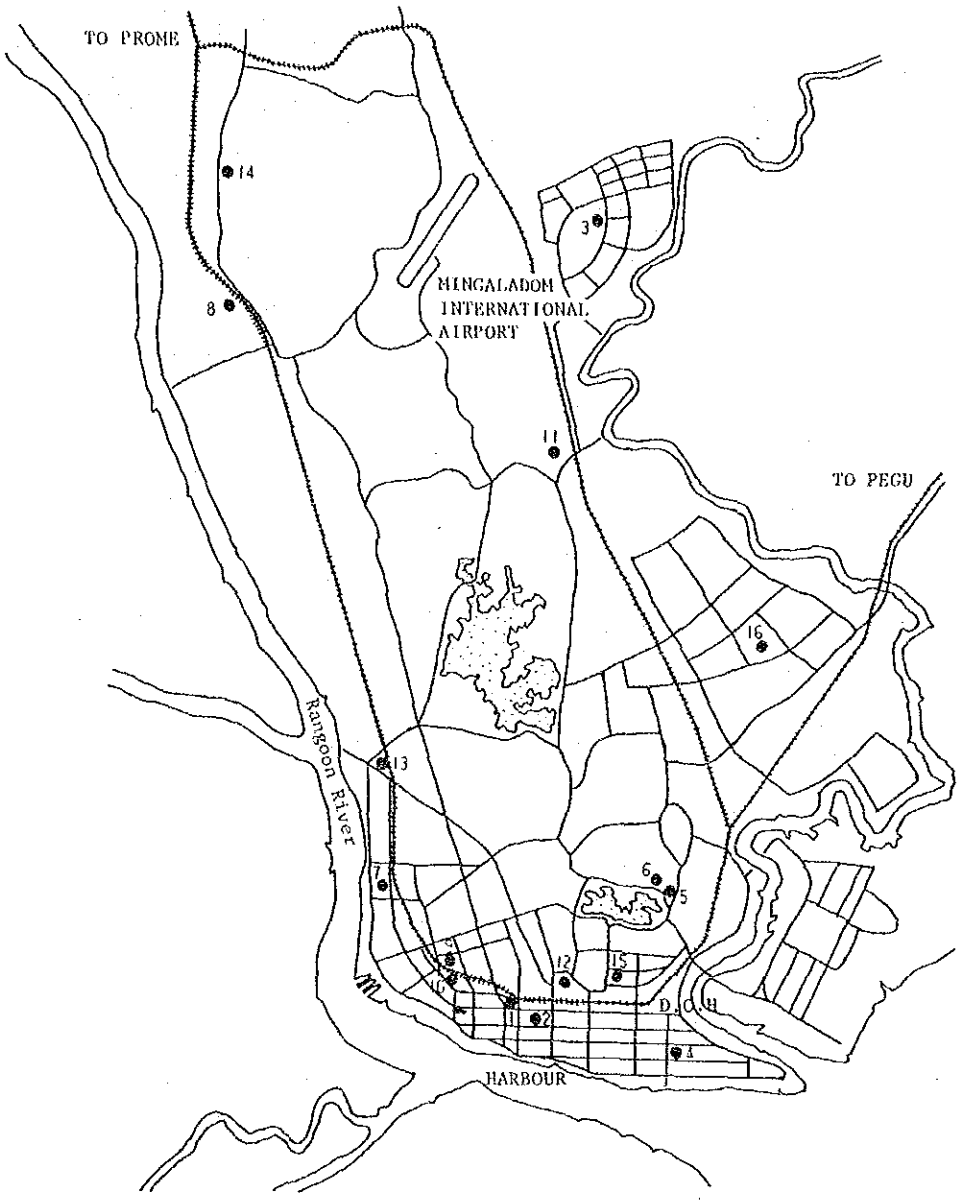


Fig. 3 — 5 LOCATION OF PRINCIPAL HOSPITALS IN RANGOON

GENERAL HOSPITALS			SPECIALIST HOSPITALS		
		beds			
1	NEW RANGOON GENERAL HOSP.	220	9	CENTRAL WOMEN'S HOSP.	800
2	RANGOON GENERAL HOSP.	1,500	10	RANGOON CHILDREN'S HOSP.	550
3	NORTH OKKALAPA HOSP.	250	11	PSYCHIATRIC HOSP.	1,200
4	EAST RANGOON HOSP.	200	12	EENT HOSP.	150
5	WORKERS' HOSP.	200	13	ORTHOPAEDIC HOSP.	400
6	KANDAWGYI HOSP.	12	14	AUNG SAN T.B. HOSP.	300
7	WEST RANGOON HOSP.	200	15	INFECTIOUS DISEASE HOSP.	200
8	INSEIN HOSP.	150	16	WOMEN & CHILDREN HOSP.	150

2-2-5 Mandalay General Hospital (M.G.H.)

In the year 1925 Mandalay Municipal Authority had established a General Hospital with a bed strength of 250 for Mandalay Town. In 1937 this hospital was subsidised by the Government. Just before the 2nd World War this bed-strength was increased to 350.

During the 2nd World War, all the Hospital buildings were demolished, (except the main operation theater) as a result M.G.H. was temprarily shifted to the St. Peters' Boys High School (now No. -9- S.H.S.).

Only after renovating buildings up to present status in 1952, M.G.H. was again shifted back to present compound.

During 1954 Mandalay medical College was opened and M.G.H. was in corporated as a teaching hospital. In June 1965 M.G.H. bed strength was sanctioned to present of 800 beds.

(1) Main Index

- No. of outpatients annually (1982)

New outpatients:	98,810
Old outpatients:	114,430
Total:	213,240

- No. of inpatients annually (1982): 44,698 (Death 1,071)
- No. of beds: 800 (in practice 1,020 beds are available)
- Operations (1982); 9,599 elective surgical operations
  7,876 emergency surgical operations
- Staff

Consultants (specialist)	21
Medical Officers (C.A.S.)	104
Medical Administrators	2
Nursing Staff	181
Technicians	94
Others (including Manual Workers)	387
	780

· Budget

The total budget for medical affairs in M.G.H. is Kyats 6 million and the budget allocation for overall maintenance occupies about 10% as follows:

Fiscal year	1981 - 1982	K. 761,790
	1982 - 1983	K. 760,000
	1983 - 1984	K. 600,000

· Organization of the hospital

There are all together 18 Major Department.

- Department of Medicine (3 Units)*
- Department of Surgery (3 Units)*
- Department of Obstetrics & Gynaecology (3 Units)*
- Department of Paediatric (3 Units) including Neonate
- Department of Orthopaedic
- Department of Urology (Surgery)*
- Intensive Care Unit & Traumatic Unit
- General O.P.D. & Emergency O.P.D. Unit
- Department of Skin & Special Skin Unit
- Dental Unit
- Department of Clinical Pathology*
- Department of Forensic Pathology (Forensic Medicine)
- Department of Radio Diagnostic
- Department of Radiotherapy
- Department of Physical Medicine
- Department of Psychiatric
- General Administrative Department

The * marked represent departments that have requested project. Chest Surgery is included in Department of Surgery (3 Units).

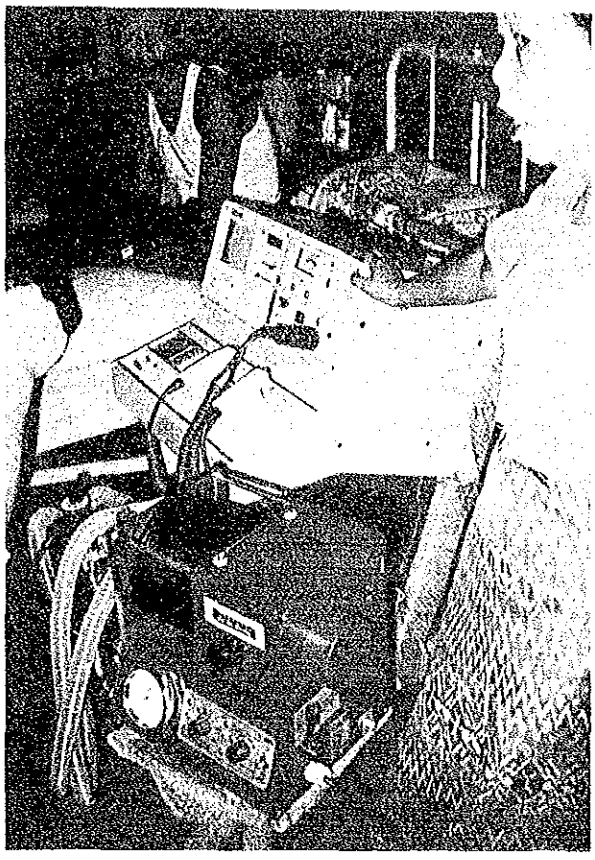
The main diseases treated at this hospital are shown in Appendix 3-4.

(2) Infrastructure

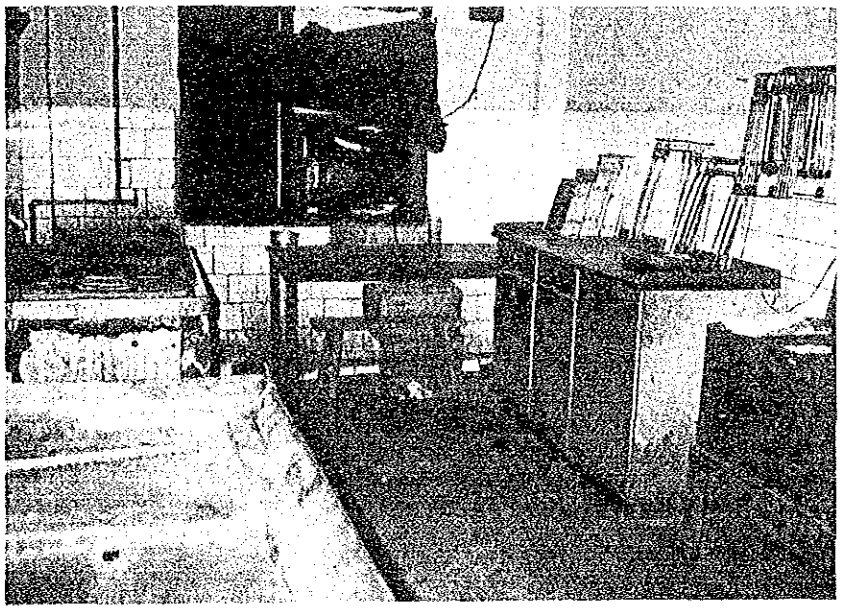
The infrastructure conditions of M.G.H. is worse than for the hospitals in Rangoon. Water is supplied from a well, pumped up to an overhead water tank. However, the water is not filtered nor sterilized. 4 lit./h of distilled water is produced in the Clinical Pathology Laboratory.

The power capacity is 3ø-400V, 750KVA and the emergency power is 3ø-400V, 18.75KVA. As a whole the power is not sufficient. The electric current is often interrupted even for whole days. Many equipments are not grounded. Therefore, there is the possibility of shorting and damage. This may also be the case in other hospitals.

The X-ray rooms do not have enough protective barriers against radiation and many rooms do not have air conditioners.



Medical Equipment in Ward



Development room for X-ray films in M.G.H

CHAPTER 4. BASIC DESIGN

4-1 Policy for Equipment Selection

The approach to selection of medical equipment was determined on the basis of a study on the current medical situation in the Socialist Republic of the Union of Burma according to the following criteria.

(1) The need for the services performed in each hospital.

(2) The performance of hardware and software equivalent to the levels of medical service provided by each hospital.

(3) The Burmese ability to maintain and operate that equipment, or the potential to improve that ability after short-term technical instruction.

(4) The need for large-scale construction work and utility work before equipment installation.

(5) The potential risk of accidents and environmental pollution after equipment installation.

4-2 List of Equipment Selection

The study team evaluated the contents of the request of the Government of Burma and prepared the following list on the basis of the selection criteria described in the previous section. (O indicates equipment selected; X, equipment omitted; and ⊙, equipment added.)

SECTION		REQUIRED MEDICAL INSTRUMENT	STANDARD 1	2	3	4	5	RESULT OF SELECTION
1. NEW RANGOON GENERAL HOSPITAL (220 Beds)								
*RADIOLOGY	1	Whole Body CT Scanner				X	X	x
	2	Remote Controlled Cassetteless X-ray Diagnostic T.V. System				x	x	x
	3	Film Drive System				x	x	x
	4	Gamma Camera System				x	x	x
	5	Auto Multi Gamma Counter				x	x	x
*CLINICAL LABORATORY	6	Autoanalyzer						x
	7	Blood Gas Analyzer						x
2. RANGOON GENERAL HOSPITAL (1500 Beds)								
*RADIO THERAPHY	8	Linear Accelerator						O
*CLINICAL LABORATORY	9	Platelet Counter and Accessories						O
	10	W.B.C. Counter and Accessories						O
	11	Automatic Dilutor						O
	12	Ion Analyzer and Accessories for Na, K, Cl and CO_2						O
	13	Blood Gas Analyzer and Accessories						O
	14	Double Channel Auto Analyzer with Recorder and Accessories						O
	15	Autoanalyzer						O
	16	Prothrombinometer and Accessories						O
	17	Fluorescent Microscope with Camera Attachment						O
	18	Immuno-electrophoresis Apparatus and Accessories						O
*CARDIOLOGY	19	Pan Angiography		X	X	X	X	X
	20	Echo Cardiogram						O
	21	Treadmill Monitoring ECG						O

SECTION	REQUIRED MEDICAL INSTRUMENT		STANDARD					RESULT OF SELECTION
			1	2	3	4	5	
*CARDIOLOGY	22	Analyzer of Holter Monitoring System including Holter						O
*NEURO SURGERY	23-31	Operating Microscope System for Neuro-surgery						O
	32-49	Microsurgical Instrument						O
	50-54	Micro Instrument for Vessel Surgery						O
	55-60	Instrument for Transpheniodal Hypophysectomy						O
	62-64	Stryker Craniotome Instrument						O
	65	Laser Surgery Equipment	X		X			X
	66	Patient Monitor for I.C.U.						O
	67	Intracranial Pressure Monitoring System a Complete Set .						O
	68	D.C. Defibrillator with Trolley						O
	69	Wrights Respirometer						O
	70	Portable Electric Suction for Neuro-surgery						O
	71	Sterilizer						O
	72	Electronic Blood Gas Analyzer						O
	73	Air Conditioner						O
*ORAL, MAXILLO FACIAL & PLASTIC SURGERY OPERATING THEATRES	74	Operating Table						O
	75	Measure Operating Light						O
	76	Portable Operating Light						O
	77	Strong Suction Apparatus						O
	78	Diathermy Sets (Portable)						O
*IN-PATIENT WARDS	79	Instrument Sterilizers for Ward Use						O
	80	Suction Apparatus for Ward Use and Out-Patient Department						O
	81	Dressing Trolleys						O
	82	Air Conditioner for Dressing Room						O

SECTION	REQUIRED MEDICAL INSTRUMENT		STANDARD					RESULT OF SELECTION
			1	2	3	4	5	
*OUT-PATIENT DENTAL DEPT.	83	Complete Dental Unit with Chair, Light, Air Roter with Built-in Compressor						O
	84	Complete Set of Portable Dental X-ray Unit						O
	85	Complete Set of Portable Developing Unit						O
	86	Complete Range of Dental X-ray Films						O
	87	Sterilizer						O
*URO-SURGERY	88	Nephroscope & Accessories for Biopsy						O
	89	Lecture Scope						O
	90	Bioling Sterilizer						O
*CHEST SURGERY	91	Fiber Bronchoscope						O
	92	Fiber-Esophagoscope						O
	93	Endoscope Locker						O
	94	Fiber Teaching Attachment						O
	95	Endoscope Illuminator						O
	96	Low Pressure Suction Unit						O
	97	Suction Apparatus						O
	98	Nakayama Gastric Clamps (+4,000 clips)						O
	99	Pneumonectomy Set						O
	100	Endoscopic Electrohydraulic Table						O
*OPERATION ROOM	101-1	Ventilators for Operation Theatre						O
	101-2	Anesthetic Machine	O	O				◉

SECTION		REQUIRED MEDICAL INSTRUMENT	STANDARD					RESULT OF SELECTION
			1	2	3	4	5	
3. CENTRAL WOMEN'S HOSPITAL (800 Beds)								
*DELIVERY UNIT *CLINICAL LABORATORY *NEONATAL UNIT *OPERATION ROOM *ANESTHESIOLOGY	102	Delivery Tables						O
	103	Neonatal Resuscitation Unit with Suction & O_2 Attached						O
	104	Electrical Bowl Sterilizer						O
	105	Electric Suction Apparatus (Adults)						O
	106	Electric Suction Apparatus (Neonates)						O
	107	Automatic Tissue Processor						O
	108	Blood Bank Refrigerator						O
	109	Fowler's Beds						O
	110	Oxytocin Drip Regulator - Electronic with Tocodynamometer						O
	111	Ultra Violet Spectrophotometer						O
	112	Coloriemeter						O
	113	CVP Monitor with PCO_2 Analyzer,Adults						O
	114	Incubators for Babies						O
	115	Conduction Analgesia Set Continuous Epidual Set (Disposable)						O
	116	Electric Cortery						O
	117	Cryosurgical Set						O
	118	Microsurgical Tuboplasty Instruments Complete Set with Operating Microscope						O
	119	Electric Vacuum Extractor with Suction Curette						O
	120	Ultrasound Linear Scanner						O
	121	Sonocaids (Doppler)						O
	122	Dilatation and Curette Instruments						O
	123	Hysterectomy Set (Instruments)						O
	124	Caesarean Section Set (Instruments)						O

SECTION		REQUIRED MEDICAL INSTRUMENT	STANDARD					RESULT OF SELECTION
			1	2	3	4	5	
	125	Ambu Resuscitator for Adults and Neonates						O
	126	CCTV with 2 way Communication System	X	X	X			X
	127	Microscope Trinocular						O
	128	Microscope Binocular						O
	129	Microscope with Microphotography						O
	130	ECG Machine						O
	131	Freezing Microtome with Sharpener						O
4. CHILDREN'S HOSPITAL, RANGOON (550 Beds)								
*INTENSIVE CARE UNIT	132	Minimonitor Cardioscope						O
	133	Cardiac Monitoring System						O
	134	Cardiac Resuscitation System						O
	135	Skin Blood Gas Analyzer						O
	136	Thermister Electrical Thermometer	X					X
	137-1	Suction Machine, Low Type						O
	137-2	Suction Machine, High Type						O
	138	Respirators and Mechanical Air Compressors for Neonates & Infants						O
	139	Respirators and Mechanical Air Compressor for Older Children						O
	140	Incubator						O
	141	Computor Monitor Infusion Pump						O
	142	Oxygen Analyzer (For Incubator)	X					X
	143	Autoanalyzer for Electrolytos with Recorder for Na, K, Cl						O
	144	37°C Water Bath (For Blood Warming)						O
	145	X-ray View Box (Triple) with Trolley						O
	146	E.C.G.						O

SECTION	REQUIREE MEDICAL INSTRUMENT		STANDARD					RESULT OF SELECTION
			1	2	3	4	5	
*PEDIATRICS	147	Echo Vision (Ultrasonic Diagnostic Equipment)						O
	148	Bronchoscope (Non-rigid) with Accessories, Neonates & Children						O
	149	Cystourethroscope with Accessories (Including Resectoscope) Two Sizes						O
	150	Portable X-ray Unit						O
	151	Fibre Optic Colonoscope						O
	152	Blood Gas Analyzer						O
	153	Echocardiogram						O
	154-1	Suction Machine, Low Type						O
	154-2	Suction Machine, High Type						O
	155	X-ray View Box (Triple) with Trolley						O
	156	Ultrasonic Nebuliser						O
	157	E.C.G. Machine						O
*NEONATAL UNIT	158	Incubator						O
	159	Apnoea Monitor						O
	160	Oxiemeter (Direct Reading)						O
	161	Reflectance Meter for Blood Glucose Estimation						O
	162	Phototherapy Unit						O
	163	Bilirubinometer						O
	164	Infusion Pump						O
	165	Oxygen Piping System	X	X		X		X
	166	Oxygen Synthesizer Plant	X	X		X		X
	167	Plasma Exchanger & Haemodialysis Machine		X	X			X

SECTION		REQUIRED MEDICAL INSTRUMENT	STANDARD 1	2	3	4	5	RESULT OF SELECTION
5. MANDALAY GENERAL HOSPITAL (800 Beds)								
*URO-SURGERY	168	Fibre Optic Iglesias's Resectoscope						O
	169	Fibre Optic Rotating Resectoscope						O
	170	Electro-surgical Unit Solid State Type, Combined with Fibre-optic Light Source						O
	171	Randall's Kidney Stone Forceps Stainless Steel, 4 kinds of Curve						O
*THORACIC SURGERY	172	Bronchofibrescope for Biopsy						O
	173	Suction Unit with Standard Accessories and Spare Bottles (4) 220V, 50Hz						O
*GENERAL SURGERY	174	Pan View Fibrescope						O
	175	Colonoscope						O
	176	Peritoneoscope						O
	177	Endoscope Locker						O
*INTERNAL MEDICINE	178	Echo Cardiogram						O
	179	Electric Suction Unit						O
	180	Monitor Difibrilator						O
*CLINICAL LABORATORY	181	W.B.C. Counter						O
	182	Platelet Counter and Accessories						O
	183	Autoanalyzer and Accessories for Na, K, Cl and CO_2						O
	184	Prothrombinometer and Accessories						O
	185	Double Channel Autoanalyzer with Recorder and Accessories						O
	186	Autoanalyzer						O
	187	Blood Gas Analyzer and Accessories						O

SECTION		REQUIRED MEDICAL INSTRUMENT	STANDARD					RESULT OF SELECTION
			1	2	3	4	5	
*OBSTETRICS AND GYNAECOLOGY	188	Vacuum Extractor						O
	189	Super Suction Curettes						O
	190	Aspirator, Supplied with Abortion Cannula Set and Tube & Standard Accessories						O
	191	Polaroid Type 611 Black & White Land Film		X				X
	192	Resuscitator (For Neonates)						O
	193	Miller's Laryngoscope Set for Neonatal and Paediatric Care Use						O
	194	Disposable Endotracheal Tubes		X				X
	195	Y Adapters (Disposable)		X				X
	196	Endoscopic Examining Chair	X					X
	197	Kobak's Needle (For Paracervical and Pudendal Nerve Blocking)						O
	198	Physician's Office Scale						O
*X-RAY DEPARTMENT (DARK ROOM)	199	Automatic X-ray Developing Machine	O	O				◉
6. DEVELOPMENT OF ICU & CCU AT THE STRATEGICALLY LOCATED GENERAL HOSPITAL			X	X	X	X	X	X
7. MOBILE SERVICE UNIT	202	Dental and X-ray Mobile Unit						O
8. PROSTHETIC/ORTHOTIC SERVICES-COMMUNITY PROGRAME FOR DISABILITY PREVENTION AND REHABILITATION PROJECT					X	X		X
9. DEVELOPMENT OF KIDNEY UNIT IN RANGOON GENERAL HOSPITAL				X	X	X		X
10. MOBILE SERVICE UNIT	203	Ophthalmic Mobile Surgical Unit						O

The reasons for equipment selection are described in the following sections.

4-3 Examination on Equipment Selection

The equipment requested by the Government of Burma include Precision Clinical Equipment, Automatic Chemical Analyzer, Diagnosis/Analysis Equipment. The study team reached the following conclusions on the basis of an analysis of the equipment need, the suitability of equipment to the medical level, the management capability of the staff, the need for large-scale construction and utility works, and safety requirements.

(1) New Rangoon General Hospital

This hospital is an integrated training hospital, which serves as a clinical research center. The focus of the Project is on early medical treatment of gastroenterology. The equipment requested is necessary to provide basic operation of this hospital and to allow it to serve as a medical center for gastroenterology.

⊙ Before installation of the X-ray Diagnostic Unit (Whole Body CT Scanner [No. 1], Remote-controlled X-ray TV Unit [No. 2], and Film Driving System [No. 3]), work is required to improve and reinforce the floor to support the equipment load, to provide RC flooring to prevent X-ray exposure and the large-scale interior work such as the wood core wall (including the X-ray barriers of lead-lined plates and the lead-plate door).

⊙ For installation of the Radio Theraphy equipment (Gamma Camera [No. 4] and Gamma Counter [No. 5]), law and regulations applicable to radio theraphy equipment and facilities are lacking in Burma. This equipment should be

installed based on the WHO X-ray Protection Standard. It is extremely difficult to install the equipment in the existing facilities without measures to prevent contamination and pollution. This will involve problems such as storage of nuclear materials used for the examination, disposal of used nuclear materials, treatment of nuclear contaminants, maintenance of the treatment facility, treatment of contaminated water, and treatment facility for contaminated patients and operators.

Before installation of the X-ray Diagnostic Unit, Radio Theraphy Equipment in the existing facility, these problems should be solved.

Thus, to assure safety and provide effective clinical service, a new building should be constructed at this hospital site. In addition to other examination equipment (Automatic Chemical Analyzer [No. 6], and Blood Gas Analyzer [No. 7]), the requested equipment should be installed in the new building.

(2) Rangoon General Hospital

⊙ The Cardioangiographic X-ray Diagnostic Apparatus [No. 19] used for the cardiology should be installed in a clean zone, equivalent to operating room conditions. The catheterization of cardiac disease (apriority and acquired), or cardiac intra cavity tests, coronary angiography, and other examinations (abdominal angiography and brain and cervical selective angiography, etc.), which are performed by catheterization require the high-level techniques and experience by the doctors. To properly conduct these examinations the Burmese doctors, X-ray technicians, and nurses should receive long-term training. In consideration of the current situation, it is still premature to introduce this equipment.

⊙ Surgical Laser for Neurosurgery is not considered essential nuerosurgical equipment. Since the maintenance system for the laser is not ready, it should be omitted.

⊙ For the Operation Room, the Anesthetic Machine, which was the focus of an oral request, as well as the Ventilators for Operation Room should be introduced. The existing equipment were damaged, in disrepair, and are cannot be used. The anethesia control performed by the anesthesian is a key to life support of a patient during a operation, as well as breathing apparatus. This equipment should be completely provided.

(3) Central Women's Hospital

The introduction of the Closed Circuit TV System [No. 126], the instruction system, which communicates between the Operation Room and other locations, requires change or replacement of the existing equipment (for example, converting from the Operating Light to the light with a build-in TV camera). Since a TV system is not essential for medical treatment itself, it is omitted from this Project.

(4) Rangoon Children's Hospital

⊙ The Thermister Electrical Thermometer [No. 136] and the Oxygen Analyzer [No. 142] included in the request table have been omitted because these are standard built-in devices in the Incubator [No. 140].

⊙ The Medical Oxygen Piping System [No. 165] and the Oxygen Synthetic Plant have been omitted because large-scale facility work is required and oxygen cylinder supply meets the current demand.

⊙ The introduction of the Plasma Exchanger and the Hemodialysis Machine are pending an evaluation of the supply of hemodialyzer, which are consumables, and the techniques and skills of doctors and nurses.

(5) **Mandalay General Hospital**

In the Obstetrics and Gynecology, the clinical report and other data are correctly maintained. Although the equipment and the materials requested by this department are a general-purpose unit, Film [No. 191] and Endotracheal tube [No. 194], Y adapter [No. 195]; which are consumables, have been omitted. The Chair for Endoscopy [No. 197] is not essential and is not a specially design medical chair. A general-purpose chair is available for this need.

⊙ The Automatic Developing Machine [No. 199] should be introduced as it is an indispensable device in the darkroom. The existing developing machine is obsolete, and the manual device is damaged. To perform precise diagnosis using X-rays, the film image must be processed clearly. The Automatic Developing Machine should be installed to improve the current situation.

(6) **Development of ICU & CCU at the Strategically Located General Hospitals**

This project is not a definite proposal, and a study of the candidate cities was not made of the special circumstances of Burmese. ICU and CCU Medical Systems. These require personnel with higher techniques and skills than conventional medical treatment. With a view to immature phase of the plan, this project of interest should be considered to be a topic of another project term by reviewing the existing plan.

(7) Prosthetic/Orthotic Services - Community Program for Disability Prevention and Rehabilitation Project

This project is considered to be by far out of the region of an distribution project for medical equipment, and consists of three key pillars; construction, distribution in medical equipment, and technical assistance as described in Chapter 3, 3-1 "The contents and purpose of the Project". This is why the all-out promotion of the program was ruled out of the subject of the current improvement program and was postponed for later review.

(8) Development of Kidney Unit in Rangoon General Hospital

The existing Rangoon General Hospital has insufficient space for 10 artificial dialyzers and related equipment. According to the Government of Burma, there is no building accommodating these equipment but an available for space of land. To execute this project, the planning should include the building construction plan.

For Artificial Kidney Units, a team of skilled doctors and nurses or skilled dialysis technicians will provide high-level clinical treatment for the patients. Before implementation of this project, a study should be made on problems such as location and the techniques.

Based on these examination the following section describes equipment list in the Basic Design.