

BASIC DESIGN STUDY  
ON  
THE MEDICAL EQUIPMENT SUPPLY PROJECT  
IN  
PAPUA NEW GUINEA

MARCH 1987

JAPAN INTERNATIONAL COOPERATION AGENCY



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**ON**  
**THE MEDICAL EQUIPMENT SUPPLY PROJECT**  
**IN**  
**PAPUA NEW GUINEA**

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**MARCH 1987**

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## PREFACE

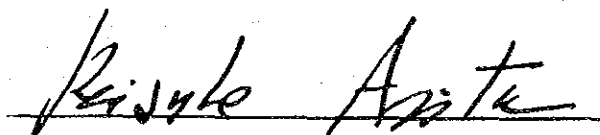
In response to the request of the Government of Papua New Guinea, the Government of Japan has decided to conduct a basic design study on the Medical Equipment Supply Project and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Papua New Guinea a study team headed by Mr. Hiroyoshi IHARA, Senior Assistant, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs from November 30th to December 24th, 1986.

The team had discussions on the Project with the officials concerned of the Government of Papua New Guinea and conducted a field survey at 13 Provincial Hospitals. 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 Papua New Guinea for their close cooperation extended to the team.

March, 1987

A handwritten signature in black ink, reading "Keisuke Arita", written over a horizontal line.

Keisuke Arita

President

Japan International Cooperation Agency



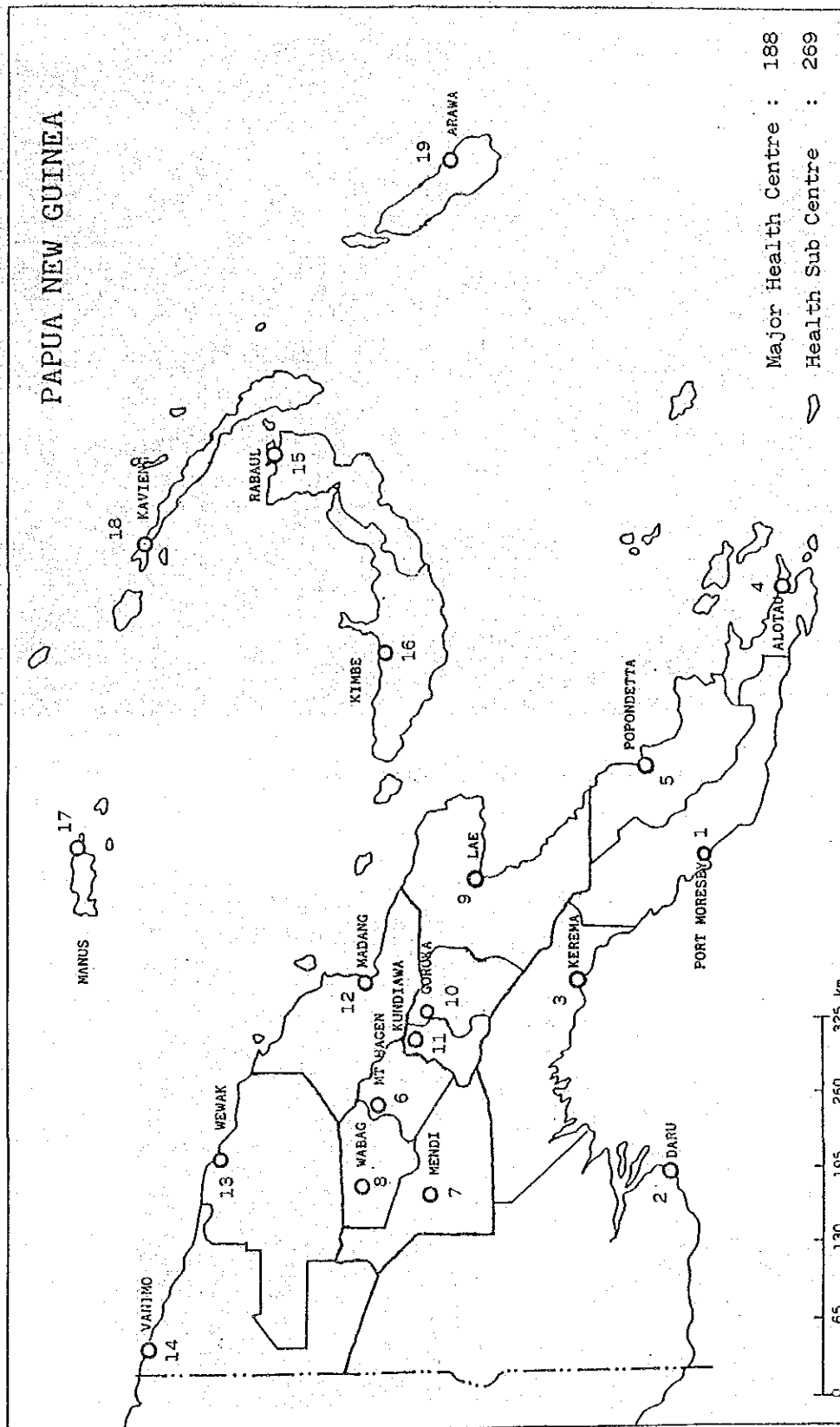
## A B B R E V I A T I O N S

A D B	Asian Development Bank
A P O	Aid Post Orderly
A V A	Australian Volunteer Association
C H C	Church Health Centre
C H S	Church Health Sub-Centre
C U S O	Canadian University Services Overseas
D E N T O F F	Dental Officer
D E N T O R D	Dental Orderly
D E N T T E C H	Dental Technician
D E N T T H E R	Dental Therapist
D I S P	Dispenser
E C	European Communities
F A S	First Assistant Secretary
G D P	Gross Domestic Product
G N P	Gross National Product
G V S	German Volunteer Services
H C	Health Centre
H E O	Health Extension Officer
H G U	Mt. Hagen
H L T H I N S P	Health Inspector
H O S P O R D	Hospital Orderly
H S C	Health Sub-Centre
I B R D	International Bank for Reconstruction and Development
I V S	International Volunteer Services
J O C V	Japan Overseas Cooperation Volunteers
K	Kina = 160 Yen
M A F	Medical Assistance Fund
M A G	Madang
M C H	Maternal and Child Health
M E D L A B A S S T	Medical Laboratory Assistant
M E D L A B T E C	Medical Laboratory Technician
M E D T E C H	Medical Technologist
M E D O F F	Medical Officer

NCD	National Capital District
NURS AIDE	Nurse Aide
NURS OFF	Nursing Officer
OCC THER	Occident Therapist
OED	Overseas Economic Development
PMGH	Port Moresby General Hospital
PNG	Papua New Guinea
POM	Port Moresby
RAB	Rabaul
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Family Planning Association
UNICEF	United Nations Children's Fund
UNV	United Nations Volunteer
USAID	United States Agency for International Development
VSO	Volunteer Services Organization
WHO	World Health Organization
WWK	Wewak



# PAPUA NEW GUINEA



Major Health Centre : 188  
Health Sub Centre : 269

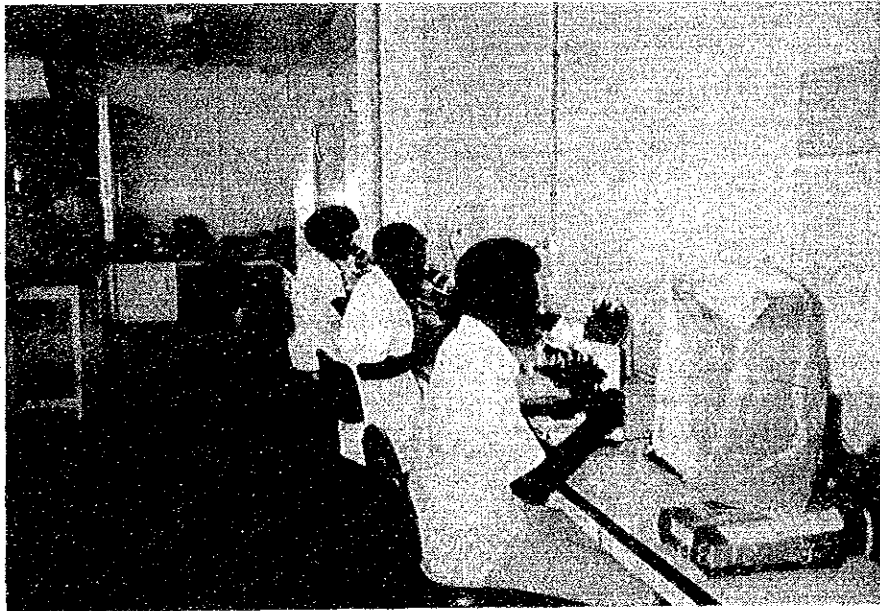
- |                              |                            |                             |                            |
|------------------------------|----------------------------|-----------------------------|----------------------------|
| 1. PNG General Hospital      | 6. Mt. Hagen Base Hospital | 11. Kundiawa Prov. Hospital | 16. Kimbe Prov. Hospital   |
| 2. Daru Prov. Hospital       | 7. Mendi Prov. Hospital    | 12. Madang Prov. Hospital   | 17. Manus Prov. Hospital   |
| 3. Kerema Prov. Hospital     | 8. Wabag Prov. Hospital    | 13. Wewak Prov. Hospital    | 18. Kavieng Prov. Hospital |
| 4. Alotau Prov. Hospital     | 9. Lae Base Hospital       | 14. Vanio Prov. Hospital    | 19. Arawa Prov. Hospital   |
| 5. Popondetta Prov. Hospital | 10. Goroka Base Hospital   | 15. Rabaul Base Hospital    |                            |



Port Moresby General Hospital



Pediatric Ward



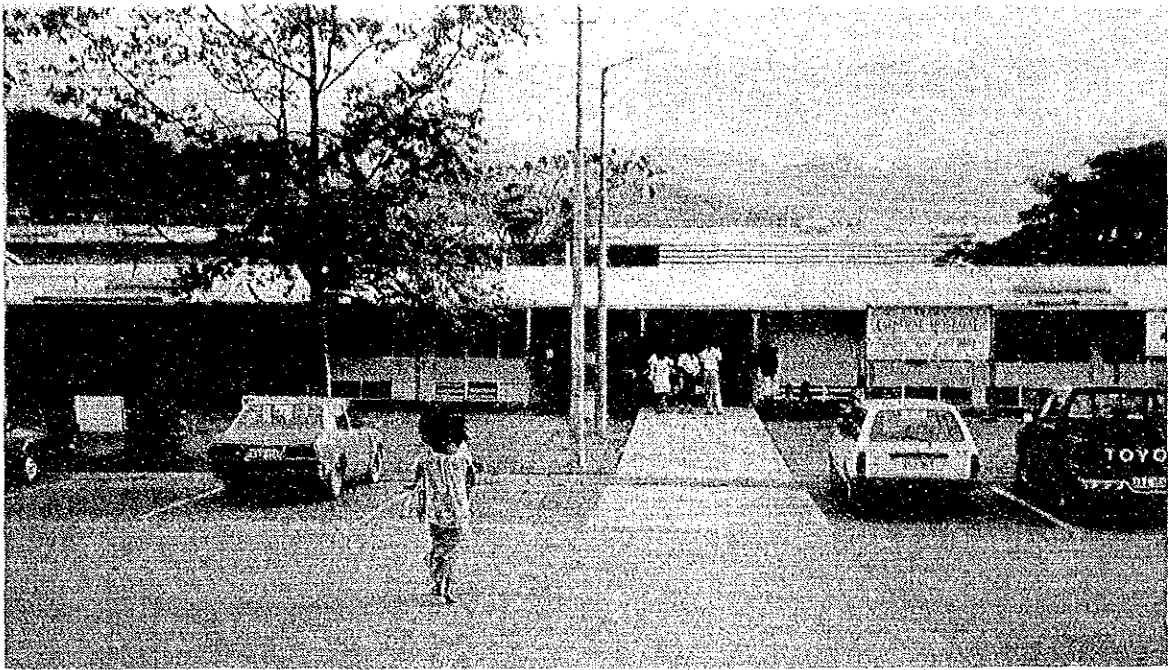
Laboratory



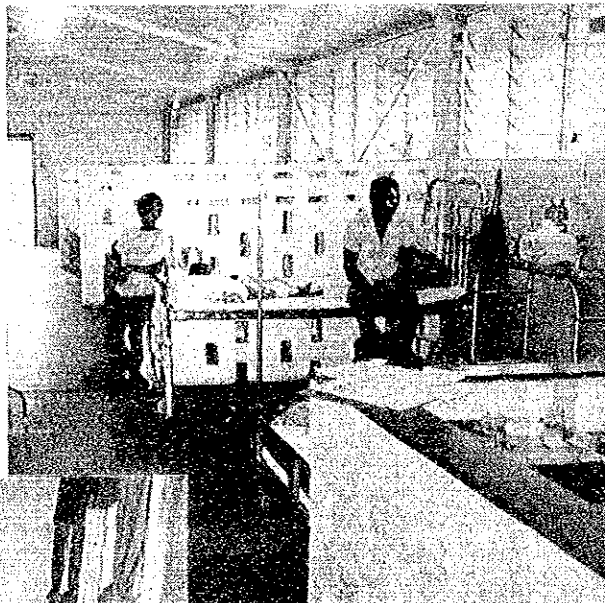
I C U Ward



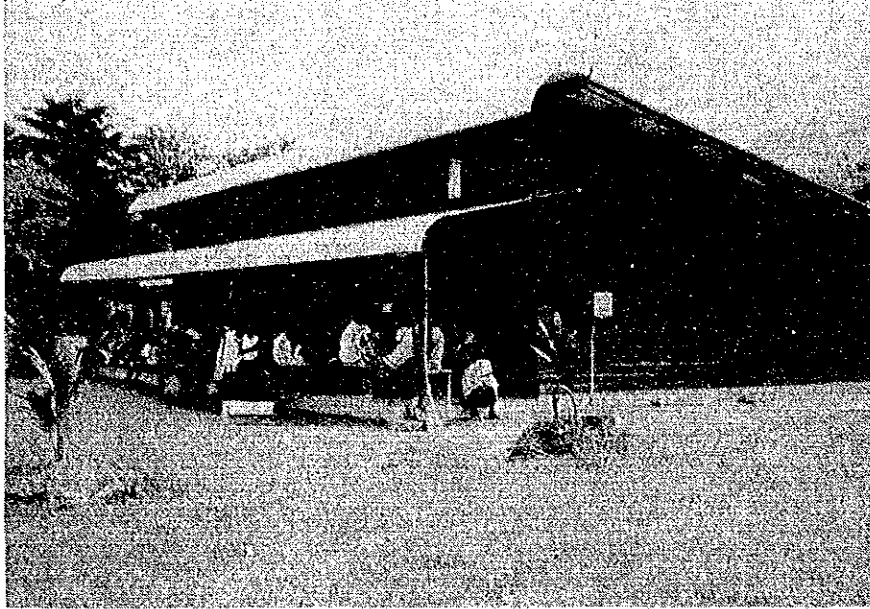
Surgical Ward



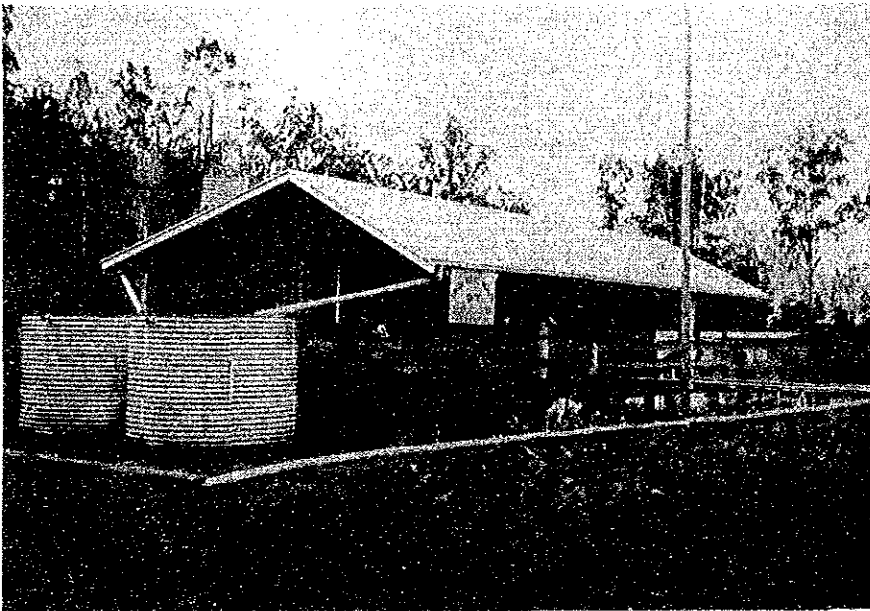
Arawa General Hospital



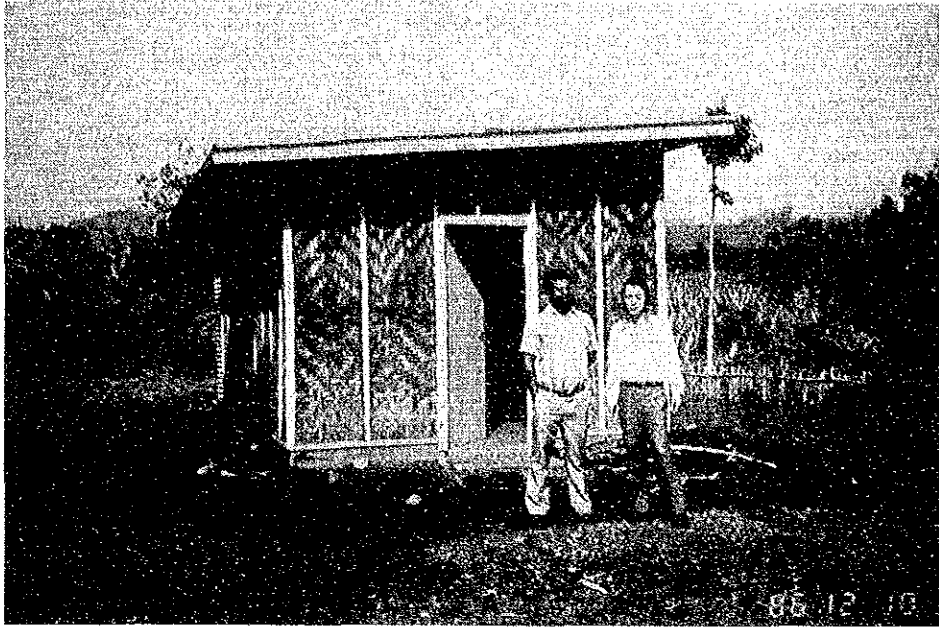
Treatment



Health Centre



Health Sub Centre



Aid Post



Medical Store





## SUMMARY

Papua New Guinea since its independence in 1975, has aggressively endeavoured to improve its economic and social conditions. Accordingly, as shown in annual rises in GNP, it has achieved a consecutive upward economic development. However, under the specific circumstances that a considerable portion of the national finance has had to rely on foreign aid, and that the exports of primary products of the agriculture and mining sectors of this country have been sluggish due to recent stagnation of the world economy and international market, strict performance of the national finance has resulted in a lower progress of its national economic development programme.

Despite the above-mentioned financial situation, however, Papua New Guinea has been making serious efforts in the field of health and medical services based on the Government policy of equalization of national benefit and public welfare among the population. Efforts are being made to increase the number of rural hospitals and medical clinics, and to provide them with better medical equipment through close cooperation with WHO and other related organizations. As a result of these efforts, the average life span in the past decade has increased remarkably from 40.6 years in 1971 to 49.6 years in 1980. Being encouraged by such success, Papua New Guinea formulated the Second National Health Project (1986~1990) in order to strengthen medical services to the public by improving existing medical facilities in rural areas.

In June 1986, Papua New Guinea requested the Government of Japan for Grant Aid for a project to improve equipment of medical facilities and local hospitals in order to achieve the objective of the Second National Health Project of the country.

In compliance with this request, the Government of Japan decided to carry out a basic design study and sent, through the Japan International Cooperation Agency, a basic design study team to Papua New Guinea from 30 November to 24 December 1986. In consulting with the Papua New Guinean officials concerned, the team collected necessary information and data, and conducted a field (facility) survey. The team prepared a basic design of the Project based on the analyses of the findings of the survey, and taking into account the results of the above-mentioned consultations.

The followings are the outline of the conclusion of the study.

Medical service activities in Papua New Guinea are carried out by the government organizations in close cooperation with church missions, and the Government of Papua New Guinea renders financial support to these activities. There are also a small number of hospitals and medical clinics operated by private enterprises or individuals.

According to 1984 statistics, numbers of health and medical staff are 283 doctors, 2,514 nursing officers, 4,827 nurse aides, hospital and aid post orderlies, 332 health extension officers and 164 health inspectors. 48.7% of the above-mentioned doctors are foreigners.

There are 19 hospitals, 468 health centres and sub-centres, and 2,231 aid posts, with average number of beds per one facility of 241 in the case of hospitals, 17 in the case of health centres/health sub-centres, respectively. But no hospitalization facility is available in the case of aid posts.

Numbers of the main medical equipment installed in 13 existing medical facilities confirmed by the basic design study team through its field survey are 20 X-ray units, 4 dental X-ray units, 1 cobalt therapy unit, 2 ultrasound scanners, 3 electrocardiographs, 3 defibrillators, 1 auto-analyser, 41 microscopes, 7 anesthetizers, 45 high pressure sterilizers, 18 freezers and others. However, as a large number of the above-mentioned equipment belonged mainly to the Port Moresby General Hospital, which is the largest and best equipped general hospital in the country, it can be said that the numbers of medical equipment installed in the medical facilities of Papua New Guinea as a whole is not sufficient.

Main diseases prevailing in Papua New Guinea are pneumonia, malaria, diarrhea of various etiologies, tuberculosis, leprosy, some kinds of skin disease, diseases arising from pregnancy, malnutrition, sexually transmitted diseases, mental diseases, dental diseases, and tumors, as well as injuries resulting from traffic or other accidents. The patients suffering from these diseases are increasing according to statistics being published since 1960. Patients of pneumonia, malaria, various kinds of diarrhea and communicable diseases are many in number. Many patients of pneumonia are seen in the southern highland area, and malaria is prevailing in coastal swamp areas and in the islands. Recently, tuberculosis has been increasing in many urban areas and in the 3 provinces of Mandy, East Sepik

and West Sepik. Many leprosy cases are seen in the middle highland area, especially in urban settlements. Mental diseases and accidents attributable to drinking are also increasing. Changes of life style and diet seem to be reflected in increased cases of malignant tumor, heart disease, diabetes and hypertension.

As for foreign economic and technical assistances in the field of health and medical services, 7 countries, namely Australia, Austria, Canada, West Germany, Japan, Netherland and New Zealand are rendering financial assistance under bilateral agreements. In addition to the above, international organizations such as UNDP, UNESCO, UNFPA, UNICEF, WHO, World Bank and Asian Development Bank have also rendered financial assistance to Papua New Guinea totalling \$12,965,000 , \$2,784,000 and \$2,247,000 in 1982, 1983 and 1984 respectively.

Despite its tight financial situation, Papua New Guinea has achieved a commendable level of success under its own policies on health services. With a view of achieving the objective of creating a healthy nation by extending expanded health services to rural areas, Papua New Guinea has newly formulated the Second National Health Project. Through this project the Government of Papua New Guinea aims at reinforcement of existing medical facilities providing them with additional medical equipment in rural areas in order to make medical welfare available to the general population.

Taking into account the above-mentioned background, and in keeping with the guidelines set out below, the team has prepared a basic design with regard to the Medical Equipment Supply Project in Papua New Guinea:

- (1) Project should be implemented within the scope of existing medical facilities, as well as numbers and technical level of current medical staff.
- (2) Project should be implemented without changing the existing organizational and management system.

According to this basic design, achievement of maximum results in the field of health service activities may be expected with a minimum financial burden on the part of Government of Papua New Guinea. The Project is implementable within the scope of the Government's current financial, organizational and logistic capabilities.

Type and quantity of medical equipment to be supplied for each medical facility proposed in the Basic Design Study Report on the Project are shown below.

Summary of Proposed Medical Equipment Supply

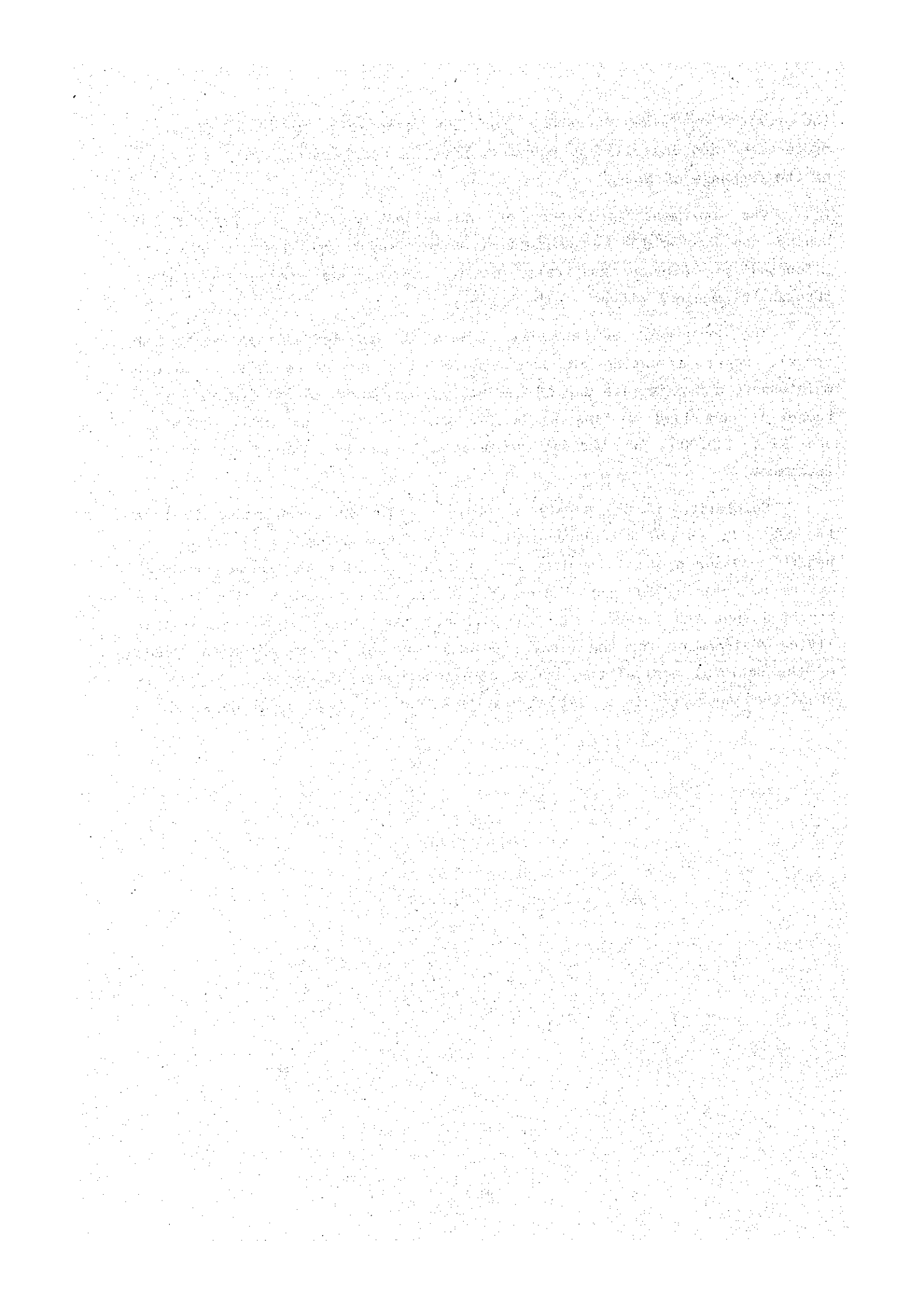
Facility	Equipment	Quantity
Port Moresby General Hospital (1 hospital)	Ultrasound Scanner	1
	Standard Patient Bed	10
	A.A. Spectrophotometer	1
	Dental Equipment	5
	Others	
Provincial Hospital (19 hospitals)	Mobile X-Ray Unit	12
	Gynecological Examining Table	4
	Standard Patient Bed	630
	Spot Lamp for Wards	100
	Top Pan Balance	18
	Others	
Health Centre (199 centres)	Stethoscope	199
	Spygmomanometer (Mercury Type)	199
	Minor Surgical Instrument Set	199
	Others	
Health Sub-Centre (296 centres)	Stethoscope	296
	Spygmomanometer (Mercury Type)	296
	Minor Surgical Instrument Set	296
	Binocular Research Microscope	296
	Others	

The period of time necessary for the completion of the equipment procurement and installation works will be 10 months after the conclusion of the Exchange of Notes.

The implementation agency of the Project will be the Ministry of Health and the medical equipment provided under the Project will be allocated to relevant hospitals, health centres and health sub-centres through the medical stores of the Ministry.

The Government of Papua New Guinea is expected to appropriate an annual budget amounting to Kina 200,000 in order to ensure smooth maintenance and effective use of the medical equipment to be supplied; this budget is comprised of Kina 10,000 for electric, fuel and water expenses; and Kina 190,000 for medical consumables expenses related to medical equipment.

Completion of the supply of medical equipment as proposed in this Project will enable the Government of Papua New Guinea to activate its health services along its policy with neither changing the present medical system nor placing further burdens on its financial situation. It is thus expected that the Project will contribute to the realization of healthful living environment for the rural population as well as to the enhancement of the national medical and health services. Accordingly, the Project is considered appropriate for implementation under the Grant Aid Programme.



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## **CHAPTER I. INTRODUCTION**



## CHAPTER I

### INTRODUCTION

Papua New Guinea (hereinafter referred to as "PNG") has been aiming at equalization of national benefit and public welfare as one of its national development objectives since its independence in 1975. In the field of public welfare, a high priority has been placed, under the cooperation of the World Health Organization and other organizations concerned, on the reinforcement of medical facilities in local areas by establishing an increased number of hospitals and medical clinics. These efforts resulted in a remarkable improvement of average life span of the population from 40.6 years to 49.6 years during the last 10 years from 1971 to 1980.

PNG, reviewing the past 10 years since its independence, is now aiming at reinforcement of medical services in rural areas, through the Second National Health Project (1986~1890), the basic policy of which is to improve operation and maintenance of the existing medical facilities.

However, this project will be difficult to obtain good result as planned because of tight budgetary situation due to a reduction in export earning of agricultural, mineral and other primary commodities under the long-term stagnation of the world economy and international markets.

Therefore, the Government of PNG requested the Government of Japan in June 1986, for Grand Aid to carry out the project for improving medical equipment in rural hospitals and similar institutes in order to develop and reinforce rural medical activities as well as the rural medical health system.

In compliance with the above request, the Government of Japan decided to perform a basic design study and dispatched, through the Japan International Cooperation Agency, from 30 November to 24 December 1986 to PNG a basic design study team headed by Mr. Hiroyoshi Ihara, Senior Assistant, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs.

The team examined the contents of the request, purposes and implementation plan of the Project; surveyed medical facilities and other related medical institutions, and current status of health staff and

planning of future health services; and studied the health services operational system.

The team analysed the information and data collected and results of the study. In the process of this analysis, the team excluded a Cobalt Therapy unit and large type of X-ray units from the supply list because of a delay in preparation work of the recipient site and PNG's intention of taking separate budgetary steps to obtain them. This report describes project components, scope, implementation programme, implementation schedule and project evaluation.

## **CHAPTER II. BACKGROUND OF THE PROJECT**





## CHAPTER II

### BACKGROUND OF THE PROJECT

#### 2.1 Brief Description about PNG

##### (1) Geographical Situation

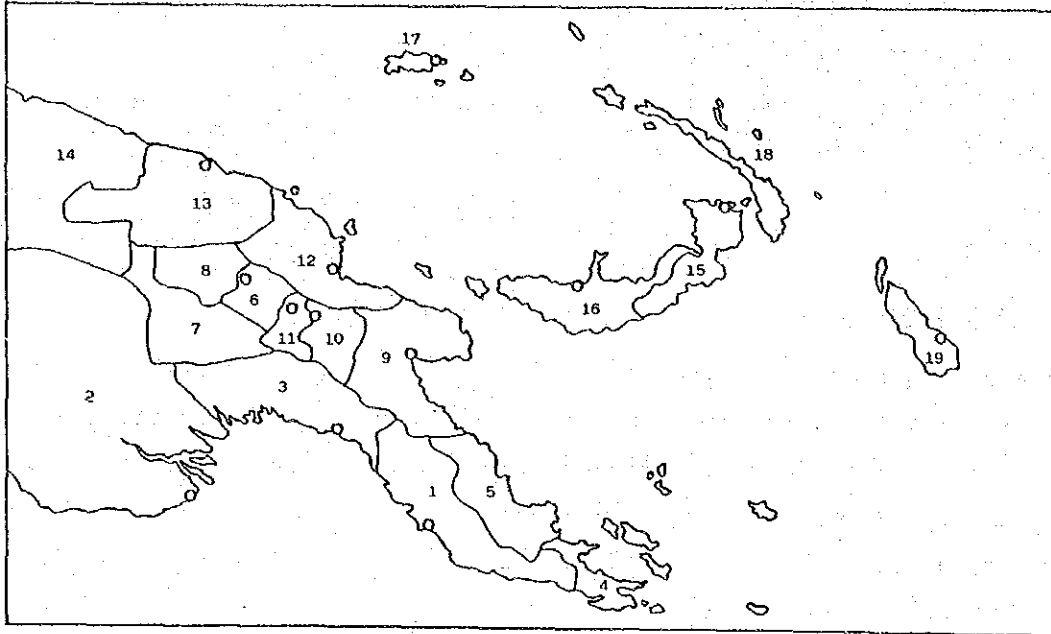
PNG is located under the Equator at  $0^{\circ}\sim 12^{\circ}\text{S}$  and  $141^{\circ}\sim 160^{\circ}\text{E}$ . The west side of the main island of New Guinea is bordered by Indonesia. The northeastern coast of Australia is at a distance of about 130km to the south of PNG.

##### (2) Topography

PNG encompasses a total area of 460,000 square kilometers, or about one and a quarter (1.25) times the size of Japan, and it consists of the main island of New Guinea, and Woodlark Island, Rossel Island, Tagula Island, Misima Island and Irobreiland Island in the south and New Britain Island, New Ireland Island, Bougainville Island and Manus Island in the north. A precipitous mountain range extends in the centre of the mainland of New Guinea, the highest peak of which is Mt. Wilhelm at 4,706 meters. A flat and mostly swampy area stretches around Papua Bay in the south of the main island.

(3) Administrative Divisions

PNG consists of the following 19 provinces:



- |                               |                               |
|-------------------------------|-------------------------------|
| 1) Central Province           | 11) Simbu Province            |
| 2) Western Province           | 12) Madang Province           |
| 3) Gulf Province              | 13) East Sepik Province       |
| 4) Milne Bay Province         | 14) West Sepik Province       |
| 5) Oro Province               | 15) East New Britain Province |
| 6) Western Highland Province  | 16) West New Britain Province |
| 7) Southern Highland Province | 17) Manus Province            |
| 8) Enmga Province             | 18) New Ireland Province      |
| 9) Morobe Province            | 19) North Solomons Province   |
| 10) Eastern Highland Province |                               |

#### (4) Climate

With the exception of the middle highlands and a part of the southern coastal area, PNG belongs to the tropical rainy zone. The wet season is from December to April, when the north-west or west monsoon blows and temperature is between 24° and 36°C with humidity of 85~98%. The dry season is from May to October, when the south-east monsoon prevails and temperature is between 22° and 30°C with humidity of about 60%. Average annual rainfall is 2,000mm. However, the gulf area specifically, where annual rainfall is over 5,000mm, constitutes one of the most rainy areas in the world.

### 2.2 General Socio-economic Situation

The political system of PNG is a constitutional monarchy with the British Queen as the sovereign. The Governor General elected from among the PNG nationals performs the state acts for the Queen. It is a democratic country with separation of the three powers of legislation, administration and judicature. The main religion in PNG is Christianity, sects of which are diverse including the Church of England, Catholic Church, United Church, Luther Evangelical Church, etc. However, traditional faiths such as ancestor worship and soul worship are still preserved.

#### (1) Population, Race and Language

Although accurate figures are not available, population is estimated at 3,000,000 as of 1980. The highland area is most densely populated where an estimated one half of the population is living. Annual average rate of increase in population is estimated at 2.3~2.6%, and it is anticipated to exceed 4,600,000 by the year 2,000. Most of the people of PNG are roughly classified as of Melanesian descent, with lesser numbers of Micronesian and Polynesian stocks. Melanesians are roughly divided into the Papua and Melanesian groups. In PNG, more than 500 different tribes speak over 700 different languages. English is an official language, while Pidgin English and Hiri Motu are spoken as common languages.

(2) Schools and Education

Primary education in PNG is 6 grades (enrollment begins from 7 years of age) and is provided in public and private schools (run by religious missions). The percentage of school attendance is estimated to be about 56% of total children of school age. Secondary education is provided by the public middle schools of 4 grades, 2 national high schools of 2 grades in which only those graduates of the public middle schools who have passed examinations are enrolled, and 9 technical colleges of which eligibility is given only to the graduates of public middle schools. As for higher education, PNG has the State University of PNG, Technical College of PNG and such colleges as Primary Teachers College (8 schools) and Bulolo Forestry College.

(3) The Economy

The economy of PNG has a dual structure consisting of a self-sufficient economy (70%) and a monetary/coin economy (30%). As for the structure of industry, the principal sector is shifting from agriculture to mining since copper production was begun in fiscal year 1972 on Bougainville Island. According to 1983 statistics, the total number of wage workers in the country was about 208,000 occupying only about 6% of the total population. Number of governmental staff and workers at public works are largest at about 70,000 people (about 33%), followed by about 52,000 workers (about 25%) in tertiary industries such as commerce and transportation, and about 36,000 workers (about 17%) in secondary industries such as manufacturing. The national budget in 1985 was Kina 930,000,000 both for revenue and expenditure. In the breakdown of revenue sources, domestic revenue such as taxation was only 55%; grant aid by Australia was 26%, loans from overseas private financial agencies was 9%, governmental loans under bilateral agreements and loans from international agencies such as World Bank and ADB was 3%, and fund raised from the other sources was 7%. In the breakdown of expenditure, 49% was allocated to the ministries of the government, 7% for public works, 4% for expenditures for capital maintenance, 6% for expenditures allocated to the local governments and governmental organizations, 4% for commercial investment made by the government, 18% for repayment of debts and 12% for other expenses.

The following is an outline of national budget for 1985 (monetary unit: 1,000,000 Kina; figures in brackets indicate the budget at the beginning of fiscal year 1984).

(i) Revenue

Domestic revenue	510.6 (445.3)
Grant aid by Australia	243.2 (225.9)
Loans	32.7 (60.6)
Loans from overseas private financial agencies	80.1 (58.4)
Others	63.5 (22.7)
Total *	930.1 (812.9)

(ii) Expenditures

Ministries	456.1 (415.7)
Public works	68.1 (51.7)
Maintenance of fund	38.4 (30.3)
Local government and governmental organizations	58.8 (70.0)
Commercial investments	34.4 (27.8)
Repayment of debts	168.6 (114.4)
Others	105.7 (103.0)
Total *	930.1 (812.9)

\* Equivalent to 148,800 million yen in 1985 and 130,000 million yen in 1984 approximately

(4) Trade Balance

According to 1984 statistics, total amount of export was Kina 813,000,000, which represented an increase of 17.7% over the previous year. By export item, mine products such as copper, gold and silver occupied 55.8% of the total amount, followed by coffee (14.1%), forest products such as lumber (8.2%), and agriculture and fisheries products such as copra (6.6%), cocoa (6.2%), palm oil (3.6%), and fish (1.4%). Japan is the biggest destination occupying 35.3% of the total amount of export followed by West Germany (25.8%) and Australia (7.5%).

Total amount of import was Kina 770,000,000. Machinery and transportation equipment such as motorcars occupied 28.6% followed by fuel such as petroleum (20.5%), food (16.5%) and manufactured goods (16.0%). Historical and geographical reasons have made Australia the biggest exporter to PNG, accounting for 39.5% of the total amount of imports, followed by Japan (15.4%), Singapore (13.4%) and the United States (9.9%).

With respect to the balance of trade, a deficit situation shifted to a surplus in 1984.

(5) GNP and Rising Rate of Prices

Per capita GNP during each of the 8 years from 1977 to 1984 was \$510, \$620, \$650, \$720 (estimation), \$790, \$820, \$780 and \$840, respectively, which indicates a steady upward trend.

As for the rising rate of prices, if prices in 1975 are assumed at 100, those in 1985 were 111.5, indicating an average price increase of 1.28% during the past 10 years.

(6) International Relations of PNG

Following independence in 1975, countries such as Japan, Australia, the United States, New Zealand, United Kingdom, Indonesia, the Philippines, Soviet Union, and People's Republic of China immediately and formally recognized PNG. As of November 1984, it maintains diplomatic relations with 62 countries including Japan. In October 1975, PNG became the 142nd member country of the United Nations. It is also a member country of such main international organizations as ICAO, IMF, IBRD, IDA, FAO and WHO.

## 2.3 National Economic Development Plan

### 2.3.1 Outline of Plan

The Government of PNG has moved to formulate the 2nd Five Year Economic Development Plan as a step to materialize 8 guidelines announced in 1974 constituting the basic principle for the economic development policies of PNG as a whole. The contents of these guidelines are as follows:

- (a) To increase the participation of PNG nationals as well as their roles in management in the economic sector of the country;
- (b) To realize equal distribution of income and social and other services;
- (c) To decentralize economic activities;
- (d) To promote small scale business activities;
- (e) To establish a self-supporting economy;
- (f) To realize self-supported national finance;
- (g) To promote the active participation of women in economic and social activities; and
- (h) To establish government participation in and control over economic activities.

The Government of PNG has followed the above-mentioned guidelines in formulating national and economic development policies. One of the said national development policies provides that promotion of rural development should be given a higher priority, while acknowledging the importance of promoting modern industries and large scale projects for natural resources development.

Furthermore, the Government of PNG continues to have a keen willingness to pursue economic development and has recently formulated and announced a new 5 year plan based on the aforementioned national development strategy which is scheduled to start from 1987.

### 2.3.2 Budget

The economic development strategies of PNG can be grasped from the budgetary expenditures by sector from 1984 to 1987 shown as follows:

SUMMARY OF EXPENDITURE BY SECTOR AND SELECTED AGENCIES IN 1984-1987

	1984 (Actual)	1985 (Actual)	1986-a (Rejected Budget)	1986-b (Revised Budget)	1987 (Budget)
Economic Sector	65,074.0 (100.0)	57,479.8 (88.3)	100,013.7 (153.7)	95,674.4 (147.0)	94,649.6 (145.5)
Infrastructure Sector	104,304.0 (100.0)	99,577.0 (95.5)	118,023.9 (113.2)	122,563.8 (117.5)	135,372.0 (129.8)
Social Service Sector	88,453.0 (100.0)	105,546.6 (119.3)	110,683.4 (125.1)	106,342.1 (120.2)	109,391.3 (123.7)
Health	22,414.0 (100.0)	26,138.9 (116.6)	31,514.5 (140.6)	30,289.8 (135.1)	33,567.9 (149.8)
Law & Order Sector	91,886.0 (100.0)	98,214.7 (106.9)	103,288.9 (112.4)	100,124.6 (109.0)	100,628.3 (109.5)
Administrative Sector	90,851.0 (100.0)	87,202.2 (96.0)	90,073.6 (99.1)	83,648.3 (92.1)	85,932.2 (94.6)
Inst. Medical Res.	1,238.0 (100.0)	1,491.7 (120.5)	1,674.9 (135.3)	1,667.8 (134.7)	1,823.3 (147.3)
Others	382,290.5 (100.0)	415,717.8 (108.7)	435,754.8 (114.0)	421,646.8 (110.3)	434,026.6 (113.5)
Grand Total Budget	822,858.5 (100.0)	863,738.1 (105.0)	957,838.3 (116.4)	930,000.0 (113.0)	960,000.0 (116.7)

Remarks: ( ) showing annual increase in % as of 1984 (100)  
 \_\_\_\_\_ showing remarkable budget increase

Underlined figures show the sectors for which increases in allocation of expenditures are higher than the increase rate of the total national budget.

This table indicates the facts that more expenditures have been allocated to the sectors of health and medical research and that the Government of PNG has promoted national health policies by placing higher priority on the health and medical service activities.



The following table shows the budget of the Ministry of Health appropriated for the years from 1984 to 1991 in order to implement its Second National Health Project.

Programme	Allocation (K'000)					1987-1991	Total Allocation in (%)
	1987	1988	1989	1990	1991		
Administration	2020.4	2020.4	2020.4	2020.4	2020.4	10102.0	5.6 %
Primary Health Service	3011.3	3220.8	2757.8	2742.2	2533.2	14265.3	8.0 %
Secondary " "	12902.9	14503.6	16152.0	17987.5	13786.5	75332.5	42.1 %
Manpower and Training	7326.5	7340.5	7345.9	7373.0	7395.9	36781.8	20.6 %
Pharmaceutical Service	8306.8	8552.2	8695.0	8419.0	8418.6	42391.6	23.7 %
Total	33567.9	35637.5	36971.1	38542.1	34154.6	178873.2	100.0 %

Source : Department of Finance and Planning

As shown in the table, the Government of PNG strongly indicates its firm intention to implement the targets of the New Interim National Health Programme allocating about 86% of total budget of the Ministry of Health to the sectors of secondary health service (42.1%), pharmaceutical service (23.7%) and manpower and training (20.6%), respectively.

#### 2.4 National Health and Medical Plan

In order to reinforce its health and medical services, the Government of PNG formulated the national health and medical plans for the period between 1974 and 1978 and is promoting the New Interim National Health Programme. The basic principle and conception of the national plans

are still observed in the current policy. The outlines of the New Interim National Health Programme are stated below.

(1) The New Interim National Health Programme

After studying policy and results concerning health and medical care activities for the period from independence to 1984, the Government of PNG formulated the Second Health Project in order to improve the current situation by the year 2,000. The following points are emphasized in the New Interim National Health Programme incorporated in the Second Health Project.

- (a) Equitable: To extend medical care activities to the family level for the general population.
- (b) Appropriate: National development plan and rural development plan should be well-balanced and practicable.
- (c) Efficient: To gain maximum benefit from minimum funding.
- (d) Appreciated: Such a programme should be well received by both organizations engaging in medical care activities and recipients.
- (e) Accountable: The medical organizations should be enough to operate independently at their own expenses.

1) Implementation Targets

The following implementation targets have been based on the above mentioned principles:

- (a) Hospitals, health centres, health sub-centres, aid posts, clinics and health volunteers will carry out the following primary health services:
  - treatment of common illnesses;
  - extension services for maternal and child health, including immunization, antenatal screening, growth monitoring and family planning;
  - control of communicable diseases, such as malaria, diarrheal diseases, tuberculosis, leprosy and sexually transmitted diseases;

- health improvement activities directed to the problems of malnutrition, personal hygiene, dental health and mental health;
  - promotion of environmental sanitation through the provision of safe water supplies and adequate environmental conditions, vector control, and food sanitation; and
  - health education as an integral part of all health activities,
- (b) To promote participation of rural communities in the medical care activities.
  - (c) To establish a network for primary health services among hospitals.
  - (d) To strengthen education and training programs for medical staff.
  - (e) To promote the spread of knowledge concerning health and medical care activities.
  - (f) To respect traditional culture and customs concerning health and medical care.

Thus, the targets of the New Interim National Health Programme are to achieve not only "medical treatment of illness" but also "promotion of health" through individual efforts on a day-by-day basis. These targets are shown in Table 1.

According to this Table, the Government of PNG aims at the followings by the year 2000:

- a) To make efforts to lengthen the average span of life to over 60 years (Present average life spans are 48.7 years for men and 50.7 years for women);
- b) To reduce infant mortality rate from existing 72/1,000 persons to 50/1,000 persons;
- c) To reduce birth mortality rate from existing 13/1,000 persons to 3/1,000 persons;

- d) To reduce population growth rate from existing 2.3% to 1%;
- e) To spend at least 5% (presently 4%) of GDP for health and medical services;
- f) To enhance GNP by more than US\$500 in terms of the market price of fiscal year 1980; and
- g) To rise children's immunity rate against diphtheria, tetanus, whooping cough, measles, infantile paralysis and tuberculosis up to 95.1% (presently 44~67%).

(2) Development Programme Classified by Sectors

(a) Primary Health Service

- Treatment of general illness.
- Extension services to be provided to pregnant women, embryos or fetuses and newly born children, and family planning.
- Prevention of communicable diseases.
- Elimination of unbalanced nutrition and problems related to dental and mental diseases.
- Improvement of infrastructure (drinking water, food sanitation, etc.).

Main aim of the Primary Health Service is to increase, through the above-mentioned activities, the general public's knowledge of public hygiene and health service.

(b) Secondary Health Service

Main purpose is to provide medical facilities in order to secure smooth execution of Primary Health Service. The following activities are contemplated.

- Strengthening of medical facilities to keep pace with the prospective policy of the Government.
- New construction or re-construction for superannuated structures and buildings of medical facilities.

- Supply of medical equipment sufficient to carry out Primary Health Service.
- Supplementation of medical staff.

(c) Manpower and Training

In view of the present situation that about 60% of the budget represents personnel expenses, it is extremely difficult under the current tight situation of national finance to carry out a programme of strengthening education and training of medical staff. However, the Government of PNG is trying to secure the number and training of medical staff as follows:

Doctors (PNG nationals) (including Special Doctors)	: 519	(about 105 as of 1986)
Nursing officers (including officers-in-change)	: 3,626	(about 1,850 as of 1986)
Health officers	: 1,111	(about 360 as of 1986)
Radiographers	: 70	(about 28 as of 1986)
Therapists	: 23	(about 10 as of 1986)

(2) The Second National Health Project

In addition to the above New Interim National Health Programme, the Government of PNG is carrying forward the Second Health Project, with the target of achieving by 1990 the following aims:

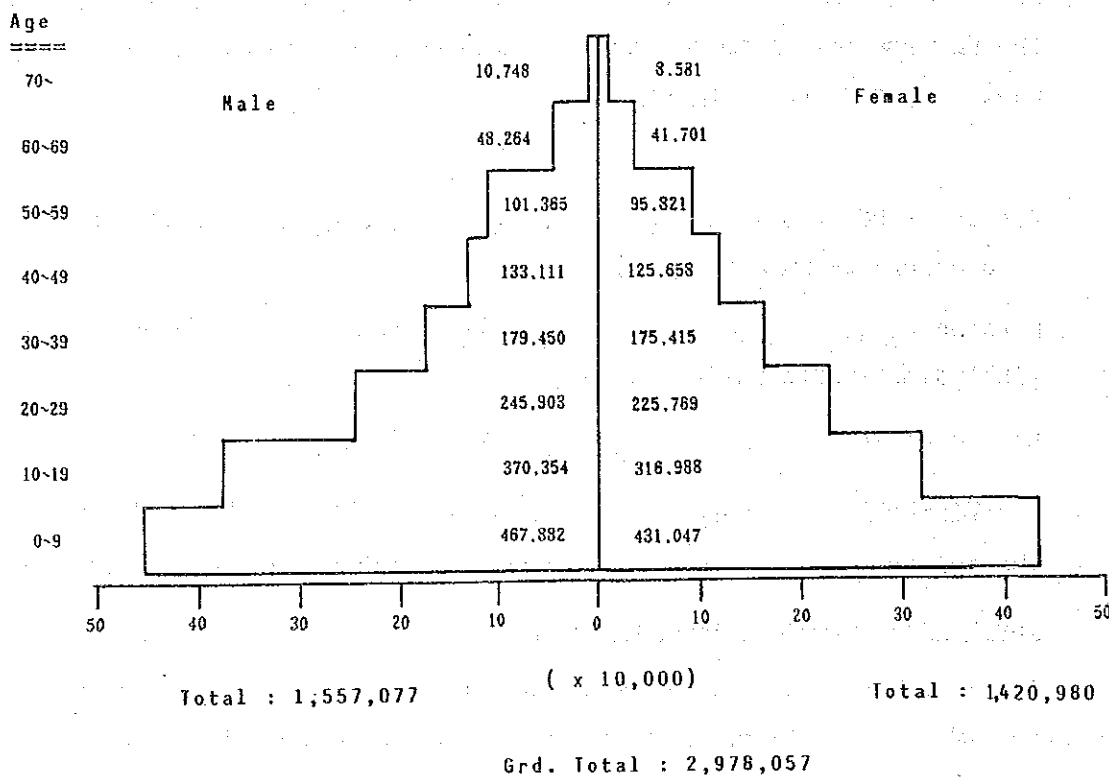
- 1) To lengthen average span of life from the existing 48.7 years to 54.2 years for men and from the existing 50.7 years to 57.9 years for women, respectively.
- 2) To reduce infant mortality rate from existing 72/1,000 persons to 60/1,000 persons.
- 3) To reduce birth mortality rate from 13/1,000 persons to 5/1,000 persons.
- 4) To reduce population growth rate from existing 2.3% to 2.1%.
- 5) To increase national vaccination rate from existing 52% to more than 80%.

2.5 Present Situation and Problems of Health and Medical Services

2.5.1 General Situation of Health and Medical Services

(1) Population

The composition of population by age in PNG is presented hereunder.



(2) Prevailing Diseases

PNG, like other tropical countries, has many communicable diseases since most parts of the country are located in the tropical rainy zone. Morbidity rates in 1984 of main communicable diseases are shown in the table below.

<u>Disease</u>	<u>No. of Patents</u>	<u>Morbidity Rate to Total Diseases</u>
Tuberculosis	3.569	1.6%
Pneumonia	31.123	14.1%

Diarrheal Disease	14.710	6.7%
Malaria	24.897	11.3%
Measles	2.449	1.1%

Furthermore, the living environment and habits of daily life are also causes of various diseases.

Outlines of these disease are as follows:

#### Respiratory disease

Bronchitis, pneumonia and whooping cough are main items of respiratory disease. Pnenumonia remains the main cause of death, particularly in rural areas. Despite the use of antibiotics, pneumonia mortality rate has risen over the past 10~15 years. According to the Tari Research Unit study, pneumonia mortality rate in children under 5 years of age in the southern highland rose from 7/1,000 in the early 1970s to 10/1,000 in the early 1980s. This may be attributable in part to penicillin resistant strains of pneumococci found recently in PNG.

#### Malaria

Malaria is a serious diseases which is the number three cause of hospital deaths. Malaria eradication programmes were pursued in the 1950s and 1960s, and 12,000 cases (out of 172,000 slides, i.e. 7% of total cases) of malaria were microscopically confirmed. And, in 1984 151,000 cases (40% of total cases) out of 379,000 slides were confirmed. This indicates that malaria cases increased 5.7 times during the 10 years' period.

#### Gastro-intestinal disease

Diarrheal disease is the second most common reason for hospital admission in children under five years and accounts for one third of all deaths in this age group. Malnutrition is the most common cause for this disease.

#### Tuberculosis

Tuberculosis is common mainly in urban settlements. In 1984, 728 tuberculosis cases were reported in NCD (National Central District). Recently, more cases are found in the coastal provinces such as Madang, East Sepik and West Sepik (See Table 8).

### Leprosy

Leprosy is found mostly in the middle-altitude zones. In 1984, 1,600 leprosy disease cases were reported in Southern Highland, Western Highland and Eastern Highland. This figure represents 18% of total leprosy cases (8,768 cases). While leprosy morbidity is slightly decreasing in the middle highlands area, it is increasing in the urban settlements (See Table 9).

### Skin Conditions

Although these diseases are not considered to be a direct cause of death, they are considered to be a serious disease because of possible linkage with malignant tumors. Many patients are found in rural, particularly mountainous areas. This disease is caused by poor living environment and sanitary conditions.

### Complications of Pregnancy

Pregnant women account for one fifth of all hospital admissions. While about 85% of the admitted pregnant woman experience normal delivery, there are a considerable number of cases of abnormal deliveries causing deaths, and these represent the tenth most common cause of death in hospitals and health centres.

### Malnutrition

Children living in middle altitude zones are affected by protein-shortage malnutrition. In 1983, about 38% of children under five-years of age who were seen at the Medical Health Centre were below 80% of average weight of the country.

### Sexually transmitted disease

According to the study made in 1984, the number of cases of gonorrhoea was 16,969, while cases of syphilis were 6,943. These indicate morbidity rate in the adult population as 90/1,000 and 32/1,000, respectively. In view of the possibility that some patients are not aware of their illness, the actual number of these diseases could be larger.

### Mental disease

The incidences of mental disease caused by psycho-social problems and alcohol abuse have been increasing in PNG. This fact is becoming a serious social problem.



### Dental disease

Although dental disease does not cause death, it affects health in general. Among school children the main dental problem is caries. For adults, it is disease in the oral cavity (oral tumor). This disease may be caused by the habit of betelnut-chewing. The coverage of dental services is low, and only less than 5% of the total population received any form of dental treatment in 1983.

### Accidents and injuries

Deaths from violence accounted for 3.1% of total deaths in 1984. The rate of traffic accidents is increasing year by year in proportion to the amount of alcohol consumption.

### Neoplastic and related disease

Malignant tumor morbidity increases with the prolonged life expectancy and changes in life style (diet and habit of life). Heart disease, diabetes and hypertension are also increasing. Malignant tumor mortality increased from 815 in 1979 to 1,045 in 1983 representing a 25% increase in 4 years (See Table 10).

## 2.5.2 Administration of Health and Medical Services

### (1) Organization of health and medical Services

Medical services in PNG are under the control of the Ministry of Health and are performed according to the following three categories partially overlapping and complementing each other:

- 1) Public organizations (national hospital and health centres)
- 2) Private organizations (hospitals attached to churches and factories and dentists)
- 3) Traditional medical services system (midwives and pharmacists, etc.)

The Ministry of Health controls medical services executed by 1) above. Prior to independence, the government medical services were centrally controlled by the Department of Public Health in Port Moresby through the District Health Officers stationed in districts and provinces. After independence, however, the Government of PNG has transferred its responsibility of delivering main health services to the Provincial Governments in order to secure more effective services for the local

communities. Thus , responsibility for effecting health services in PNG as a whole has been divided between the Ministry of Health at a national level and Department of Provincial Health at a provincial level. Main responsibilities of the Department of Health are to provide supervision and advice with regard to the health services, and those of the Department of Provincial Health are to enage in health services actually implemented in each Province. The two departments are operated under their own independent budgets.

With a view to provide local communities with more effective and appropriate health services, the Assistant Secretary of the Ministry of Health holds meetings, at least once a year, attended by nutrition and health inspectors and superintendents of the hospitals stationed in local districts. Assistant Secretary also convenes an annual meeting attended by Senior Provincial Officers and National Officers so that both central and local authorities will be able to maintain a smooth cooperational relationship.

## (2) Administratiton of Health and Medical Services

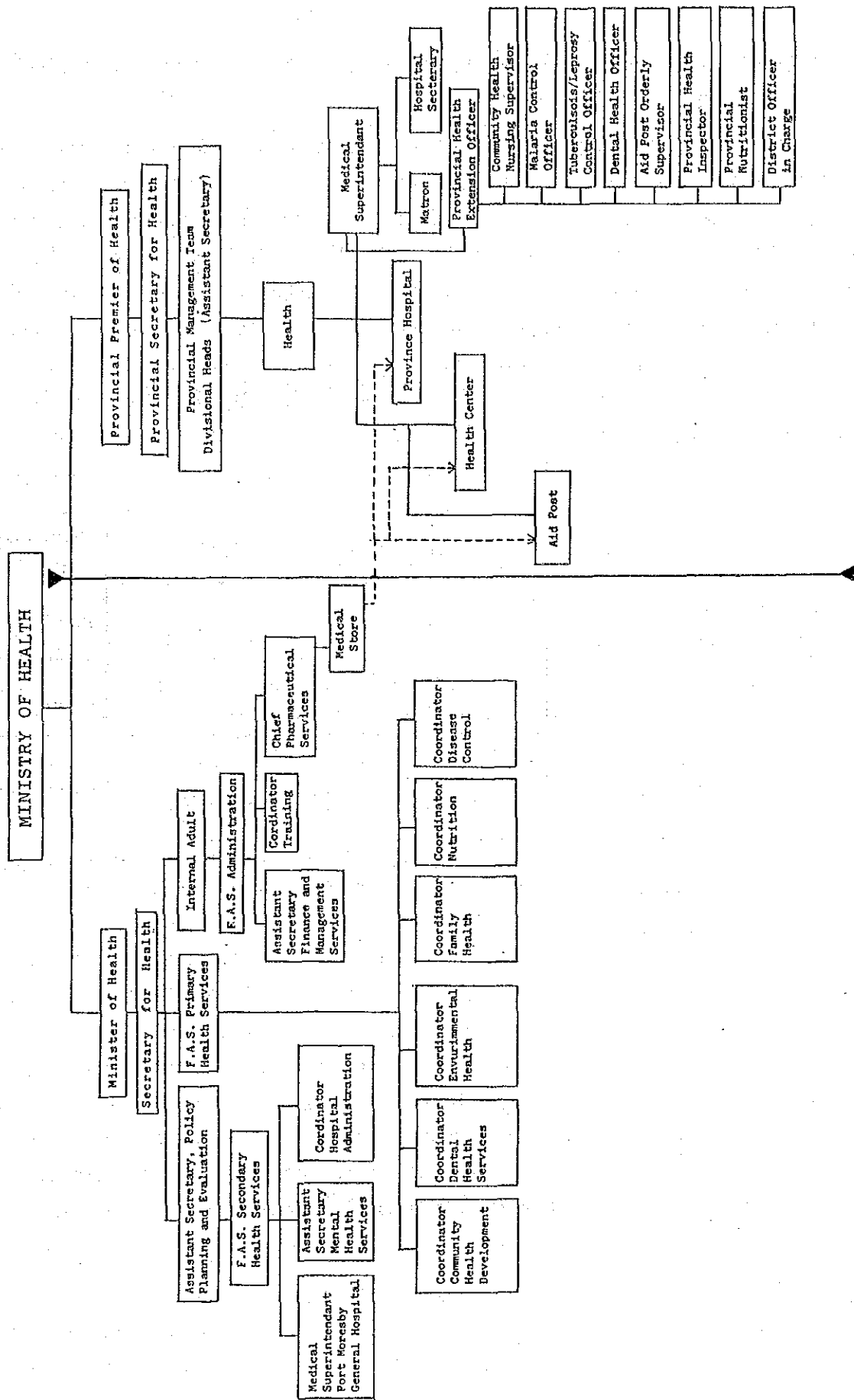
Secretary for Health of the Ministry of Health supervises its three divisions of Primary Health Service, Secondary Health Service and Administration. Each division is headed by a First Assistant Secretary who controls the activities of the division. The Primary Health Division is the largest and consisting of six sections including Community Health Development, Dental Health, Environmental Health, Family Health, Nutrition and Disease Control.

The Secondary Health Service Division deals mainly with the health activities of hospitals. The Administrative Division controls financial and administrative affairs, health training and services for supplying equipment and medicines to the provincial hospitals.

The Department of Provincial Health is attached to each of 19 Provinces and directly controls activities of provincial hospitals, health centres and aid posts. The Department of Provincial Health has a Medical Superintendent in charge of medical services delivered by the provincial hospitals and a Provincial Health Extension Officer who is responsible for the medical policy in each province (See Table 12).

The chart in the following page shows the organizational structure of the Ministry of Health.

Organization Structure of Ministry of Health



(3) Bed Utilization and Financial Situation of Health and Medical Services

The following table shows the average rate of bed utilization, total hospital expenses, expenses for medical services activities per person and total population of PNG in 1977 and 1985 as well as the increase rate for the respective items. According to this table, each item in 1985, with the exception of bed utilization, increased remarkably. It can be said, therefore, that although numbers of admitted inpatients did not increase in proportion to the population increase, expenditures for hospitals and medical service activities increased owing to a higher level of medical services rendered.

	1977	1985	Increasing Rate (%)
Average Rate of Bed Utilization (%)	21.68%	26.67% (1986)	about 5%
Total Hospital Expenses (Kina)	13,328,252 (¥2,132,502,320)	21,272,600 (¥3,403,616,000)	about 60%
Expenses for Medical Services Activities per Person (Kina)	4.74 (¥758)	6.36 (¥1,018)	about 34%
Population (persons)	2,809,000	3,343,000	about 20%

The rates of expenditures for health and medical services against total national budget and GNP in 1977 and 1985 were 8.7% and 2.5% for 1977, and 8.8% and 2.9% for 1985, respectively. This means that the amount of expenditures for the health and medical services during the past 10 years was maintained at almost the same level. Taking into account the increased rate of prices during the same period, however, it can be said that the above mentioned budgetary rate in real terms decreased substantially, and that the administration of health and medical services in PNG has therefore experienced a decreasing trend.

Thus, despite its efforts to continuously place emphasis on development of health and medical services, it has had to cut budgetary expenditures for this important health sector because of financial difficulties as stated in chapter II above.

It is understandable, therefore, that PNG has been requesting assistance from foreign countries including Japan.

The expenditures for the operation and administration of hospitals and other medical facilities are shared by the Department of Health and Department of Works at the rate of 49.75% and 50.25% respectively. Amount of said expenditures in fiscal year 1986 was Kina 2,981,000 (¥476,960,000).

### 2.5.3 Health and Medical Services Activities

Number of health service recipients during the period from 1981 to 1985 (ratio against total population) is as follows:

Year	Total No. of Attendance	National Total Population	Health Service Recipient in %
1 9 8 1	590,555	3,241,000	1 8. 2 %
1 9 8 2	620,678	3,330,000	1 8. 6 %
1 9 8 3	656,541	3,508,000	1 8. 7 %
1 9 8 4	690,321	3,601,000	1 9. 2 %
1 9 8 5	642,797	3,684,000*	1 7. 5 %

\* Estimated Population

The above table seems to indicate a gradual increase except in 1985, of health service recipients, reflecting successful results of the policy on health service of the Government of PNG. Moreover, the highest percentage of health service recipients seems to be about 18% in view of the existing scale of medical facilities, staff and budget. It is desired, therefore, that economic and technical assistance should be rendered in order to strengthen the establishment of medical facilities and staff training.

### 2.5.4 General Condition of Medical Facilities

#### (1) Classification, Location, and Functional Description of Facilities

Fig. 1-19 shows the classification and location of project sites in each province and district where medical equipment would be provided under

the project. Outline of the medical facilities surveyed by the basic design study team is summarized separately.

(2) General Status of Medical Facilities

1) The existing medical facilities (including health centres, health sub-centres and aid posts) in PNG consist of those maintained and operated by the government sector, church missions and the private sector (in this case usually those operated by lumber development and mining firms).

2) In urban areas, medical facilities are almost all government-run and include a general hospital in each provincial capital, one teaching hospital in the National Capital District, some general health clinics, and some specialized maternal and child health care clinics.

3) The following table shows the different type of government-run health facilities and their functions.

Facility	Total No.	Function
1. Teaching Hospital (General Hospital), Port Moresby	1	General and specialist services, training and education.
2. General Hospital (One in each provincial capital)	18	General and some limited specialist services.
3. Health Clinic	34	General out-patient and preventive services, MCH and family planning services.
4. Maternal and Child Health (MCH) Care Clinic		
5. Health Centre Rural	199	General out-patient services, some in-patient services with limited diagnostic facilities, and preventive services.
6. Health Sub-Centre Rural	209	Mainly MCH and family planning services, but with some general out-patient and preventive services.
7. Aid post Rural	2,231	Basic general out-patient services.

(a) Teaching Hospital (also known as Port Moresby General Hospital) is the principal hospital of PNG with 704 beds. Unlike other national hospitals, this hospital is offering training of doctors and medical staff (including laboratory and paramedical staff) as a teaching hospital in

addition to its original functions as a general hospital. It also has a well equipped laboratory. As the national central laboratory, it offers an intensive testing of samples sent from all over the country.

(b) The general hospitals are divided into three categories, scale and functions of each category are as follows:

a) Base Hospital:

Medical facility with 300 to 500 beds, offering special medical services, training and education of medical officers and nurses etc., and supervision and advice on local medical activities.

There are 4 base hospitals located at Goroka, Lae, Mt. Hagen and Rabaul.

b) Provincial Hospital - level 1:

Medical facility with 200 to 300 beds and specialist services. It offers training of health workers and supervision of medical clinics scattered throughout the entire province. There are 5 hospitals located at Arawa, Kundiawa, Madang, Mendi and Wewak.

c) Provincial Hospital - level 2:

Medical facility with bed number less than 200. Its functions are the same as those of provincial hospital - level 1. However, general services only are offered as no specialist is attached. There are 9 hospitals located at Alotau, Daru, Kavieng, Kerema, Kimbe, Lorengau, Popondetta, Sopas and Vanino.

(c) Health Clinics are located at the outskirts of provincial capitals, and play a supplemental role to the general hospitals. They provide out-patient services only.

(d) Maternal and Child Health Care Centres provide no direct medical services. They give instruction and advices to pregnant women and mothers after delivery.

(e) There are 2 kinds of Health Centres, those operated by the government and those operated by churches. Those operated by churches receive the same treatment as those operated by the government, being provided by the government with operational funds, medical equipments and medicines. Average numbers of beds are between 20 and 30 for child delivery and minor inpatient treatment. Health centres are staffed by

Health Extension Officers or Sisters in Charge, and the centres undertake simple surgical operations, and diagnose (microscope analysis) and treat malaria and tuberculosis patients. A doctor dispatched from the general hospital visits the health centres once or twice a month (for 2 or 3 days). Health centres are established at the rate of one health centre per 15,500 inhabitants.

(f) There are also health sub-centres run by both the government and churches (2 additional sub-centres are operated privately). They are equipped with 10 to 20 beds and usually staffed by a Sister-in-Charge, who supervises nurses and nursing-aides. Main functions of sub-centres are the same as those of health centres. They are established at the rate of one sub-centre per about 13,100 inhabitants. Communication systems in areas where the health sub-centres are located are generally poor.

(g) Aid posts are staffed by Aid Post Orderlies (male nurses), and provide simple services such as providing medications. They have no admission facilities and deal only with outpatients. The general hospital dispatches a doctor for visitation once or twice a month (for 2 or 3 days). Aid posts are established at the rate of one aid post per about 1,500 inhabitants. Many aid posts are located in extremely isolated places where patients have access only by foot.

The names of general hospitals established in each province, and numbers of beds in the health centres and health sub-centres are given as follows:



PROVINCES BY REGION	PROVINCIAL HOSPITALS	BEDS IN PROVINCIAL HOSPITALS	BEDS IN HEALTH CENTRES AND SUB CENTRES	TOTAL PROVINCIAL BEDS ALL TYPES (C + D)
A	B	C	D	E
<b>SOUTHERN REGION</b>				
PMGH (NCD)	PMGH	704		704
WESTERN	Daru	110	360	470
GULF	Kerema	82	436	518
CENTRAL			473	473
MILNE BAY	Alotau	137	344	481
ORO	Popondetta	141	175	316
TOTAL STH. REGION		1,174	1,788	2,962
	Proportion of Total Beds	26.86%	20.36%	22.52%
<b>HIGHLANDS REGION</b>				
EASTERN HIGHLANDS	Goroka Base	360	451	811
SMBU	Kundiawa	239	384	623
HIGHLANDS SUB REG. A		599	835	1,434
		13.71%	9.51%	10.90%
WESTERN HIGHLANDS	Mt. Hagen Base	226	314	540
SOUTHERN HIGHLANDS	Mendi	221	831	1,052
ENGA			704	704
HIGHLANDS SUB REG. B	(SOPAS)	447	1,849	2,296
		10.23%	21.05%	17.46%
TOTAL HIGHLAND REG.		1,046	2,684	3,730
	Proportion of Total Beds	23.94%	30.56%	28.36%
<b>MOMASE REGION</b>				
MOROBE	Angau (LAB)	379	631	1,010
MADANG	Madang	405	784	1,189
EAST SBPIK	Wewak	298	471	769
WEST SBPIK	Vanimo	126	546	672
TOTAL MOMASE REGION		1,192	2,432	3,624
	Proportion of Total Beds	27.28%	27.69%	27.55%
<b>ISLANDS REGION</b>				
EAST NEW BRITAIN	Nonga Base (RABAUL)	365	416	781
WEST NEW BRITAIN	Kimbe	127	405	532
NEW IRELAND	Kavieng	122	425	547
NORTH SOLOMONS	Arawa	264	524	788
MANUS ISLANDS	Lorengau	80	108	188
TOTAL ISLANDS REG.		958	1,977	2,935
	Proportion of Total Beds	21.92%	22.51%	21.56%
NATIONAL TOTALS		4,370	8,782	13,152

Source of data: 1986-1990 NHP and HPS questionnaire and visits

## 2.5.5 Health and Medical Facilities

### (1) Number of Beds

As stated previously, there are medical facilities of various sizes ranging from below 100 beds to about 800 beds. Total number of beds in general hospitals count 4,778, or 690 persons per bed in terms of total population. The overall bed ratio for all the facilities including 8,782 beds in health centres and sub-centres is 243 persons per bed (as of December, 1985). These figures are compared with those of neighboring countries in the following table.

Country	No. of Hospitals	No. of Beds	Population/Bed
India	15,265	392,000	1,465
Sri Lanka	461	41,051	334
Thailand	315	51,765	808
Pakistan	—	39,512	1,903
Bangladesh	—	16,591	4,868
Burma	486	27,403	1,125
Nepal	76	3,048	5,733
Papua New Guinea	19	4,778	690
Japan	37,603	1,510,464	76

Source : UN Statistic Year Book, 1978

It is understood from the above information that PNG has sufficient medical facilities (beds) as far as the figures are concerned. However, there exist regional imbalances for such facilities, ranging from 279 persons per bed to 2,093 persons per bed, which represents a 7 fold difference. The future plan should embody a countermeasure to solve this problem taking into account the population growth rate of regions with fewer medical facilities. Aid posts count 2,231 all over the country, or 1,478 persons per aid post. There again exist regional imbalance, 833 persons per aid post for the most favorable region and 8,303 persons per aid post for the most unfavorable region, or about a 4 fold difference.

COMPARISON OF BED UTILIZATION BY GOVERNMENT AND PROVINCIAL HOSPITALS

1977

1986

GOVERNMENT PROVINCIAL HOSPITALS	HOSPITAL BED UTILISATION			GOVERNMENT PROVINCIAL HOSPITALS	HOSPITAL BED UTILISATION		
	NUMBER OF AVAILABLE BEDS	PERCENTAGE OF NATIONAL TOTAL OF BEDS %	BED UTILISATION RATE- ADMISSIONS BEDS		NUMBER OF AVAILABLE BEDS	PERCENTAGE OF NATIONAL TOTAL OF BEDS %	BED UTILISATION RATE- ADMISSIONS BEDS
PMGH (NCD)	632	16.04	35.5	704	16.11	30.11	
BASE HOSPITALS							
Angau Memorial	455	11.55	20.85	379	8.67	43.35	
Goroka Base	345	8.76	20.21	360	8.34	29.85	
Nonga Base	341	8.66	14.86	365	8.35	22.03	
Mt. Hagen Base	235	5.97	35.81	226	5.17	52.57	
Group Totals	1,376	34.93	21.76	1,330	30.43	35.41	
PROVINCIAL LEVEL 1							
Arawa General	219	5.56	25.53	264	6.04	24.01	
Kundiawa	172	4.37	17.98	239	5.47	26.68	
Madang	290	7.36	12.12	405	9.27	14.93	
Mendi	169	4.29	23.41	221	5.06	18.49	
Wewak (Boram)	319	8.10	14.90	298	6.82	25.47	
Group Totals	1,169	29.68	17.87	1,427	32.65	21.33	
PROVINCIAL LEVEL 2							
Alotau	83	2.11	19.93	137	3.14	16.79	
Daru	92	2.3	25.71	110	2.52	16.36	
Lorengau	95	2.41	11.09	80	1.83	20.00	
Kavieng	114	2.89	18.03	122	2.79	18.85	
Kerema	58	1.47	23.12	82	1.88	15.85	
Kimbe	112	2.84	11.17	127	2.91	25.12	
Popondetta	129	3.27	24.33	141	3.23	28.67	
Enga Province (SOPAS)	(131)	3.22	7.47	(85)	(1.91)	11.82	
Vanimo	79	2.01	14.43	110	2.52	19.62	
Group Totals	762	19.35	13.42	909 (994)	20.08		
National Totals	3,939 (4,070)	100	21.68	4,370 (4,455)	100	26.67	

Total number of beds against the total population of the country differs from 132 persons per bed to 560 persons per bed, with a larger range of imbalance compared with that of general hospitals. Nine hospitals against the total hospitals in the country and 11 provinces from among all the provinces are situated below the national average in this regard. The table on the next page shows comparison of bed utilization by hospitals between 1977 and 1986. Utilization rate is decreasing in urban settlements while an increasing tendency is seen in rural areas. Percentages as a whole moves from 21.68% to 26.67% indicating a growing inadequacy in capacity to admit patients.

The table shows that some regions of the country are facing chronic shortage of beds for patients. In addition to the above, shortage of medical staff is a serious problem requiring urgent attention.

However, the government seems to be trying to secure a balanced allocation of beds among general hospitals, health centres, health sub-centres and aid posts in the provinces in order to resolve this serious problem. As a whole, it is appraised that the Government is endeavoring to render effective and equitable medical services to the entire general population.

## (2) Medical Equipment

General hospitals as a whole have surgical department, internal department, pediatrics, obstetrical department and radiology department, and furnished with medical equipment necessary for the basic treatment and initial diagnosis. It can be said, however, most of the equipment is too aged to function properly.

Health centres and health sub-centers surveyed by the study team were equipped only with some patient beds, stethoscopes and syringes and no major medical equipment were observed. There is, however, a health center almost equivalent to the general hospital by size and quantity of equipment in Gulf Province. This health centre is church-owned and is staffed with a special doctor.

Aid posts are equipped with only simple medical apparatuses such as pharmaceuticals, stethoscopes, clinical thermometers, tongue spatulas, etc. and no major medical equipment is seen.

## 2.5.6 Education and Training for Medical Staff

### (1) Medical Staff

In principle, medical service activities in PNG are carried out under close cooperation between governmental and private facilities (especially, those of churches). Private medical facilities have furnished effective medical services which are not available from the governmental facilities. The medical services of private facilities are furnished in accordance with the contracts concluded between governmental and private facilities, and necessary funds for the medical services undertaken by the private facilities are provided by the Government of PNG.

Some of medical staff such as doctors, health extension officers (HEO) and nursing officers belong to both governmental facilities and private facilities.

The following table shows distribution of medical staff in 1973 and 1984:

	1 9 7 3			1 9 8 4		
	Govt.	CHS	Total	Govt.	CHS	Total
Doctors	41	0	43 *	93	8	145 *
National	41	0	43 *	93	8	145 *
Expatriate	124 (75%)	27 (100%)	183 (80.9%)*	80 (46%)	11 (57.9%)	138 (48.7%)*
Total	165	27	226 *	173	19	283 *
HEOs	180	8	188	325	7	332
Nursing Officers	914	640	1554	1873	641	2514
Nurse Aides/ Hospital Orderlies	2410	324	2734	2145	574	2719
Aide Post Orderlies	1383	164	1547	1999	109	2108
Health Inspectors	—	—	63	—	—	164

Note : \* Includes doctors working in Department of Health, other government departments, the university, the armed forces, other employees and private practice, as well as government and church doctors.

Source : Department of Health

According to 1984 statistics, the medical staff of PNG consists of 283 doctors, 332 HEOs, 2,514 nursing officers, 2,719 orderlies, 2,108 aid post orderlies and 164 health inspectors working in the Department of Health, university medical faculties, churches, private hospitals, the armed forces and others. About half of doctors are foreigners. The number of doctors has not increased remarkably during the past 10 years, while the numbers of health extension officers, nursing officers and aid post orderlies have increased. The reason for this is the tendency to reinforce the medical service activities in rural areas rather than urban areas by allocating more staff to the health centres, health sub-centres and aid posts directly connecting with rural communities. As shown in the following table, number of aid posts, health centres and health sub-centres in 1984 were more than that of 1973 while the number of hospitals including special hospitals in 1984 is fewer than 1973. The number of reduced beds caused by decreased number of hospitals is supplemented by the increased number of beds in health centres and health sub-centres.

	1 9 7 3		1 9 8 4	
	Units	Beds	Units	Beds
Hospitals	19	3,865	19	4,756
Special Hospitals	9	1,231	1	60
Health Centres & Sub-centres	335	6,864	468	8,000*
Aid Posts	1,547	-	2,231	-
Total		10,960		12,816

Note : \* estimated ; Special Hospitals = old TB and Leprosy Hospitals.

Source : Department of Health

(2) Number of Inpatients per Medical Staff

Doctor	Nursing Officer	Nursing Aide/Hospital Orderly
596	102	109

Average number of inpatients whom a nurse or a nursing aide (or a hospital orderly) has to take care of is more than 100. Further, quite a number of inpatients have to depend on a single doctor. Province-wise data show that Kundiawa and Arawa are acutely short of doctors, followed by Daru, Popondetta, Mendi, Mt. Hagen, Angau, Boram, Varimo, Lorengau and Kavieng, all of which are below the national average in this regard. Nurses are lacking in the provinces of Popondetta, Mendi, Mt. Hagen, Kundiawa, Angau, Boram and Arawa. Nursing aides and hospital orderlies are in shortage in the provinces of Daru, Alotau, Mendi, Mt. Hagen, Kundiawa, Boram, Kavieng, Arawa and Port Moresby General Hospital. From the above figures, it may be understood that provinces of Mendi, Mt. Hagen, Kundiawa, Boram and Arawa need urgent reinforcement of health and medical staff.

(3) Number of Population per Medical Staff

Average number of population per medical staff is shown in the following table:

Doctor	Nursing Officer	Nursing Aide	HEO	Health Inspector	Hospital Orderly	Dental Therapist
149,886	4,365	5,745	11,530	26,380	1,650	50,731

Average population dependent on a doctor, a nurse, a nursing aide (or a hospital orderly) and a dentist are about 150,000, 4,000, 6,000 and 50,000 respectively. A health extension officer and a health inspector have to take care of about 10,000 and 26,000 inhabitants respectively.

From the regional standpoint, there, exists a very unfavourable situation in this regard in Western Highland, Simbu, Eastern Highland and East New Britai, and due measures are urgently required.

The region where medical staff are remarkably in short supply is NCD. Southern Highland, Western Highland, Simbu, Eastern Highland, Madang and East Sepik areas are also short of nursing officers compared with the national average.

As a result, Eastern Highland, Morobe, Western Highland and Simbu shall be given higher priority in reinforcing medical staff, particularly from the stand point of ratio of population per medical staff.

(4) Education and Training for Medical Staff

The Government of PNG is planning to bring forth manpower in the health sector through education and training starting from 1987 in order to dissolve the shortage of medical staff and to attain successful medical services by the year 2000.

Number of health service recipients in 1985 (ratio against total population) is as follows:

Institution	Course	No. of Trainee	No. of Tutor	Trainee / Tutor
<b>I. Government Institution (11)</b>				
1. College of Allied Health Science (Port Moresby)	Midwifery Paediatric Theatre Management Medical Technology Med. Lab. Tech. Med. Lab. Assist. Dispenser Psychiatric Radiographer Others	71	30	2.4
2. College of Allied Health Science (Madang/Kainantu)	Health Extension Health Inspection Malaria	114	31	3.7
<b>School of Nursing</b>				
1. Lae	Nursing Nurse Aid A. P. O	14	7	2.0
2. Wewak		14	4	2.0
3. Rabaul		44	7	6.3
4. Arawa		51	6	8.5
5. Mendi		49	8	6.1
6. Port Moresby		21	4	5.3
7. Goroka		53	5	10.6
Sub-total		246	41	6.0
<b>Aid-Post Orderly</b>				
1. Togoba		68	6	11.3
2. Butuwin		16	3	5.3
Sub-total		84	9	9.3
<b>II. Church Institution (23)</b>				
	Nursing Nurse Aid A. P. O	718	88	8.2



Education for all courses of medical science is provided at the College of Allied Health Science in Port Moresby and 71 students were present at lectures in 1985. College of Allied Health Science in Madang and Kainantu gives lectures on health extension, health inspection and malarial studies, where 114 students attended in 1985. Schools of nursing at 7 locations gave lectures on nursing to 246 students in 1985. 84 students attended the aid post orderly courses held at Togoba and Butumin. The church institutions, on the other hand, gave lectures on nursing to 718 students at 23 localities throughout the country. Tables 19 and 20 show the reinforcement program for the health and medical staff for the period from 1987 to 1992 in line with the 2nd National Health Project of PNG (In tabulating, adjustments were made considering the fact that the students graduated from medical institutions did not always participate in the medical services.). The tables show the following data:

- 1) The number of aid post orderlies and hospital orderlies shall ultimately be increased by 17.27% to 4,632 in 1992, starting with an initial increase rate of 9.35%.
- 2) Numbers of nurses and nursing aides shall be increased to 9,744 in 1992, or an annual increase rate of 3%.
- 3) Total numbers of health extension officers, health inspectors, medical laboratory technicians, dispensers, radiographic dental therapists, dental technicians, physiotherapists, OECs and therapists shall be increased to 1,894 in 1992, or an increase of 7 to 8% annually.
- 4) The number of doctors shall be increased to 400 in 1992, or an annual increase rate of 6%.

If the above policy targets are achieved through the envisioned education and training at various institutions, medical services of the country will be substantially enhanced within 5 years.

### 2.5.7 Personnel Expenses

Average annual salaries in 1986 for medical service staff in PNG are shown as follows, based on "1986 - 1990 National Health Plan" by the Ministry of Health.

	Grade	Average Salary (K/Year)
1)	Doctor (PNG national)	9,322
	(Expatriate)	20,680
2)	Nurse (Grade 3-8)	7,612
	(Grade 1-2)	4,190
3)	Aid Post Officer	3,082
4)	Nurse Aid Orderly	3,082
5)	Hospital Orderly	3,082
6)	Health Orderly	3,082
7)	Health Extension Officer	6,850
8)	Pharmacist (PNG national)	8,940
	(Expatriate)	18,758
9)	Radiographer	5,405
10)	Dentist (PNG national)	8,550
	(Expatriate)	20,405
11)	Dental Therapist	5,405
12)	Specialist (PNG national)	12,145
	(Expatriate)	25,555

The comparative salary rate between PNG national and foreign national medical staff who are playing major roles in health and medical services activities is 1 to 2. Thus, large personnel expenses are a factor accounting for financial burdens on health and medical services in PNG.

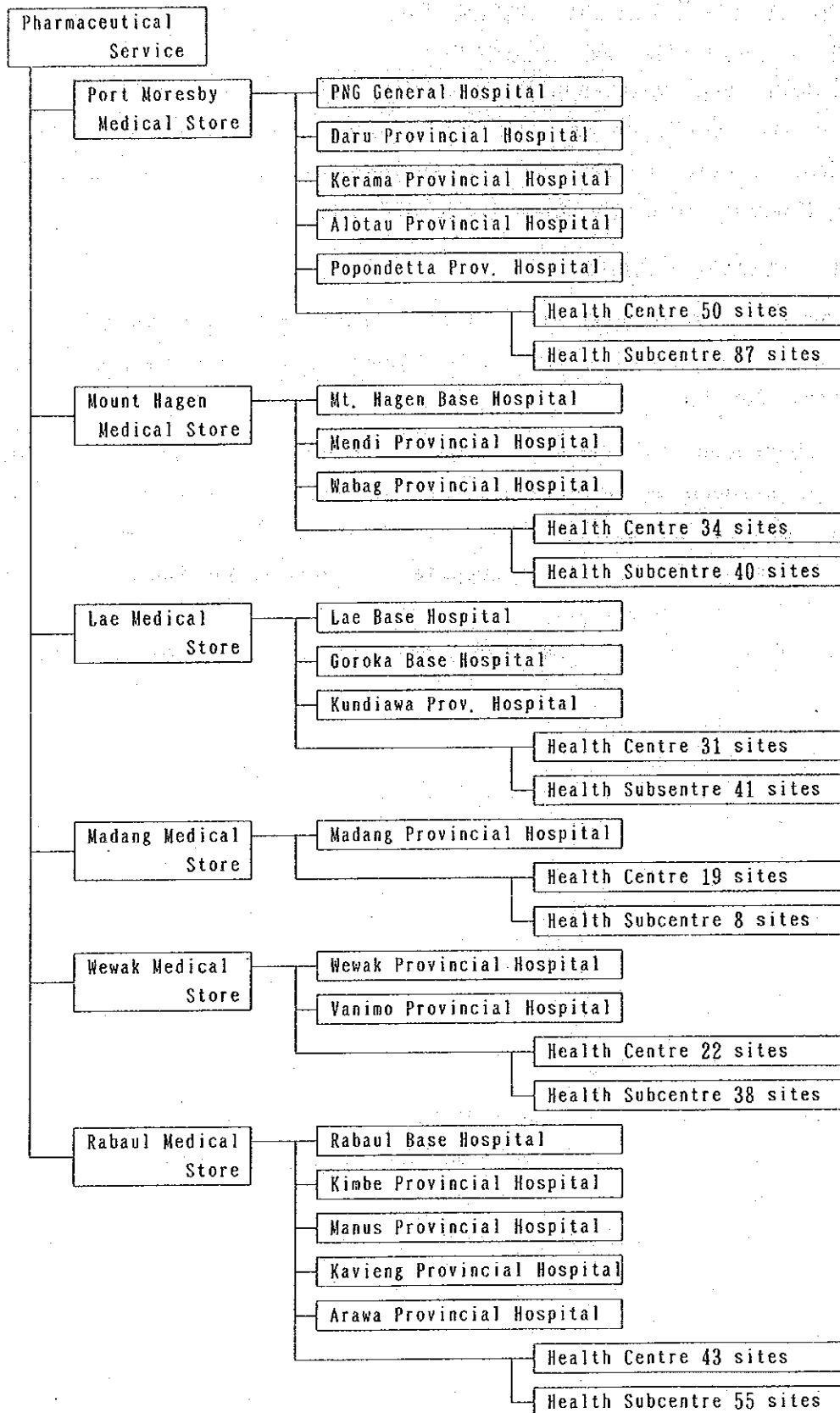
## 2.5.8 Operation and Maintenance System for Medical Facilities and Equipment

Operation and maintenance works of provincial hospitals, health centres, health sub-centres and aid posts are undertaken by the Pharmaceutical Service under the Department of Health and Biomedical Engineering Service under the Department of Works.

### (1) Pharmaceutical Service

Medical Stores are stationed in 6 blocks (Port Moresby, Lae, Mt. Hagen, Madang, Wewak and Rabaul - see all figures ) and are operated by the Pharmaceutical Service.

The Pharmaceutical Service procures through international tenders medical supplies such as pharmaceuticals, medical articles and consumables (X-ray film, developing solutions etc.). The equipment and materials are stocked in the medical stores and supplied to the 19 hospitals, 468 health centres, 2,231 aid posts, etc. under its control on request. The organization chart for the Pharmaceutical Service is shown on the next page.

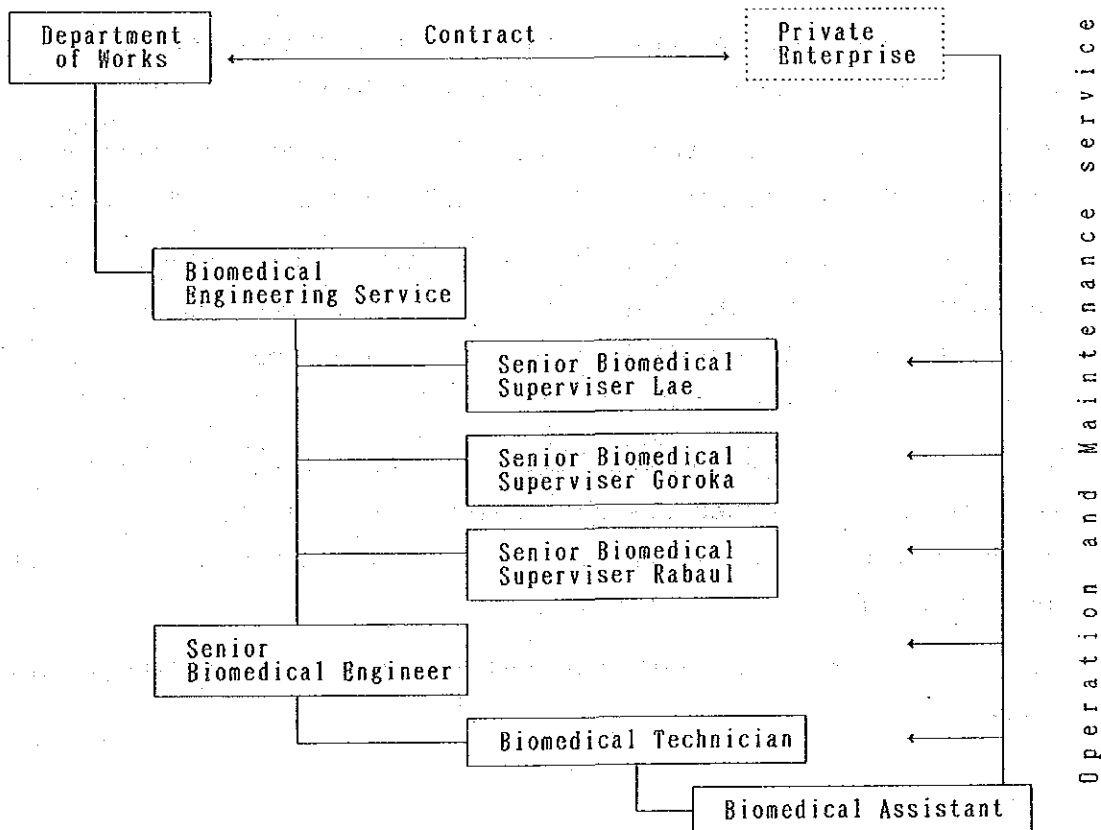


(2) Department of Works

Department of Works purchases and provides medical facilities with medical equipment including supplementary apparatuses such as boiler, kitchen wares, laundry wares etc., transportation vehicles for medical services and consumables such as fuel, etc.

The Biomedical Engineering Service assigns Senior Biomedical Supervisors to major cities of Lae, Goroka and Rabaul and the supervisors oversee operation and maintenance works in their areas.

Equipment which requires sophisticated technology for operation and maintenance such as electronic equipment (X-ray units, ultrasound scanners, etc.) and sophisticated measuring equipment for laboratories (auto-analyzers, flamephotometers, etc.) are maintained by a private corporation through concession contract. The organization chart of the Department of Works with Biomedical Engineering Services is shown in the table below.



### 2.5.9 Problems of Health and Medical Sector

In order to implement and promote the national economic development plan effectively, it is important to secure an adequate labor population, and extend the average span of life. A present urgent problem facing PNG is how to overcome the problem of frequent diseases and death caused by lack of general knowledge on public health concepts. Under such circumstances, the government of PNG has established health and medical policies including disease prevention, family planning, construction of local medical facilities, extension services for disseminating health related knowledge, education of health and medical staff and provision of equal opportunity for access to medical services among entire population.

However, in addition to economic problems, such factors as lack of general interest on health due to limited education, malnutrition caused by poverty, and high mortality rate of infants and children have made it difficult to implement government policies.

In order to overcome the above-mentioned problems, the following actions would be required as soon as possible:

- 1) To establish additional health centres, sub-centres and aid posts in rural area and improve their functions;
- 2) To strengthen the functional abilities of provisional hospitals for supporting the above-mentioned medical facilities;
- 3) To reinforce and improve the functions and responsibility of the Inspection Department of the laboratory in Port Moresby General Hospital so that appropriate guidance and cooperation may be provided to the provincial hospitals;
- 4) To secure additional medical facilities in provinces, replacement of deteriorated medical equipment, as well as establishment of an appropriate system for operation, maintenance and repair of equipment; and
- 5) To reinforce the number of medical staff and level-up training thereof.

## 2.6 External Assistance in the Field of Health and Medical Service

Australia is the largest supplier of external assistance to PNG. The relationship between PNG and Australia is very close and goes back to the time of World War II. In 1946, PNG was placed under the trusteeship of the United Nations, with Australia as the administering country, and during the subsequent period Australia cooperated with PNG in both political and economic fields. Since PNG's independence in 1975, Australia has rendered mainly economic cooperation, 25% of the total PNG national budget of Kina 900,000,000 (Approx.) for the 1985 fiscal year was in the form of financial assistance from Australia. In addition to Australia, Japan, New Zealand and the United Kingdom constitute the main countries rendering assistance to PNG. West Germany and France began providing assistance to PNG from 1987 and 1981 respectively. PNG also has been receiving assistance in the fields of monetary and technical cooperation from EC. Although the United States has not been rendering any direct bilateral assistance, it has sent to PNG volunteers as a part of the cooperation programme for the South Pacific areas through USAID. Furthermore, an agreement for dispatching American Peace Corps was concluded in 1980 between the United States and PNG. Besides, PNG has also been receiving technical cooperation from Canada and CFTC of the British Commonwealth. PNG has also received grant aid from Norway.

Volunteer activities in PNG by external sources such as JOCV (Japan), UNV (the United Nations), AVA (Australia), GVS (West Germany), IVS (United States), OED (Australia), VSO (United Kingdom) and CU/SO (Canada) are numerous.

Amounts of major external assistances in the field of health and medical care received by PNG in 1982, 1983 and 1984 are shown in the following table:

Type of Assistance	1982	1983	1984
<u>Bilateral Agreement</u>	\$	\$	\$
Australia	45,000	43,000	42,000
Austria	12,000	11,000	10,000
Canada	13,000	50,000	102,000
West Germany	3,000	8,000	-
Japan	66,000	-	6,000
Holland	-	83,000	-
New Zealand	-	10,000	-
Sub-Total	139,000	205,000	160,000
<u>International Organizations</u>			
UNDP	-	54,000	73,000
UNESCO	-	3,000	-
UNFPA	78,000	29,000	51,000
UNICEF	99,000	266,000	188,000
WHO	519,000	1,965,000	680,000
Sub-Total	696,000	2,311,000	992,000
<u>International Financial Organizations</u>			
IBRD	-	-	581,000
ADB	12,000,000	-	150,000
Sub-Total	12,000,000	-	731,000
<u>Others</u>	130,000	268,000	364,000
Grand Total	12,965,000	2,784,000	2,247,000

In 1982, by receiving a loan from the Asian Development Bank of \$120,000,000 representing 1.7% of the total national budget and 26% of health expenditure of the same fiscal year, PNG moved to improve medical service activities in rural areas, directing its main efforts at setting up more health centres, health sub-centres and aid posts.

Apart from the above, WHO is rendering considerable assistance, of which the grant aid in 1983 was the biggest among those provided during the past 3 years. At that time, the aid fund was allocated to not only existing projects but also to the newly established malaria control project.

Most of the projects requiring large amounts of funding have been assisted from foreign countries, while the small scale projects such as purchasing of consumables in the field of health and medical services have been depending on volunteer assistance from private organizations of West Germany, the United States and Canada.



The following table indicates main external assistances rendered in the field of medical care:

External Assistances (Health & Medical Care)

Country or International Organization	P r o j e c t	Year(s)	Amount
Australia	Training of Nurse(Volunteer Aid)	1983 - 1985	\$ 1,800 (per year)
	Physically Disabled Children (Volunteer Aid)	1984~	7,000 (per year)
	Technical Cooperation to the Special Doctors	1985 - 1988	809,300
	Technical Cooperation to the Radio therapists of Rae Hospital	1985	7,200
	Survey on Hospital Planning	1985	129,500
W H O	Malaria Control	1985 (1977 ~ 1985)	238,759
	Development of Genaral Medical Care System	1985 (1974 ~ 1989)	331,787
	Reinforcement of Medical Training	1985 (1982 ~ 1989)	133,214
	Technical Cooperation for the Training of Dentists in Port Moresby Hospital	1985 (1985 ~ 1987)	30,000
	Technical Cooperation for the Strengthening of the Laboratory attached to Port Moresby Hospital	1985 (1985 ~ 1987)	49,660
U N I C E F	Assistance for the First Health Project	1985 - 1987	120,000
	Survey on Local Medical Care	1983 - 1987	177,000
A D B	Reinforcement of Local Medical Care Services	1982 - 1988	12,000,000
	Improvement Programme for Functions of Provincial Hospital	1986	240,000

Country or International Organization	Project	Year(s)	Amount
C a n a d a ( M A F )	Improvement Programme for Rehabilitation Ward of Mt. Hagen Hospital	1985 - 1986	2.508
	Assistance for Medical Transport vehicles of Catholic Hospital in Montfroat	1985 - 1986	11.146
	Assistance for Rehabilitation Programme for Physically Disabled Children	1985 - 1986	23.078

## 2.7 Background and Contents of Request for Grant Aid

### (1) Background

Since its independence in 1975, PNG, as a part of its policy on health and medical services, has established increased numbers of hospitals, health centers and health clinics aiming at improvement of functional abilities of the Primary Health Project to be rendered in the rural areas.

PNG has established, after reviewing the medical facilities expanded during the past 10 years, the Second National Health Project (1986-1996), basic policy of which is to improve and reinforce existing medical facilities. However, effective implementation of this project is being jeopardised by financial difficulties of the country.

Based on the above-mentioned situation, the Government of PNG requested the Government of Japan for grant aid to carry out the medical equipment supply project for rural medical facilities including provincial hospitals in order to strengthen the health and medical service system of rural areas.

### (2) Request for Grant Aid

The medical equipment requested by the government of PNG includes 500 items such as X-ray units, cobalt therapy unit, ultrasound scanners, beds, operating tables, dental equipments, tonometers, microscopes, foveizers, surgical knives, etc. to be provided to all 19 provincial hospitals, all medical stores and administrative sections of these medical

facilities. These medical facilities are facing problems of outdated and out-of-order (no way of repairment is available because of old models) equipment which has been causing a bottleneck in improvement of rural medical service activities being promoted by PNG. Request for the supply of medical equipment is indispensable for this country.



### **CHAPTER III. OUTLINE OF PROJECT AREA**

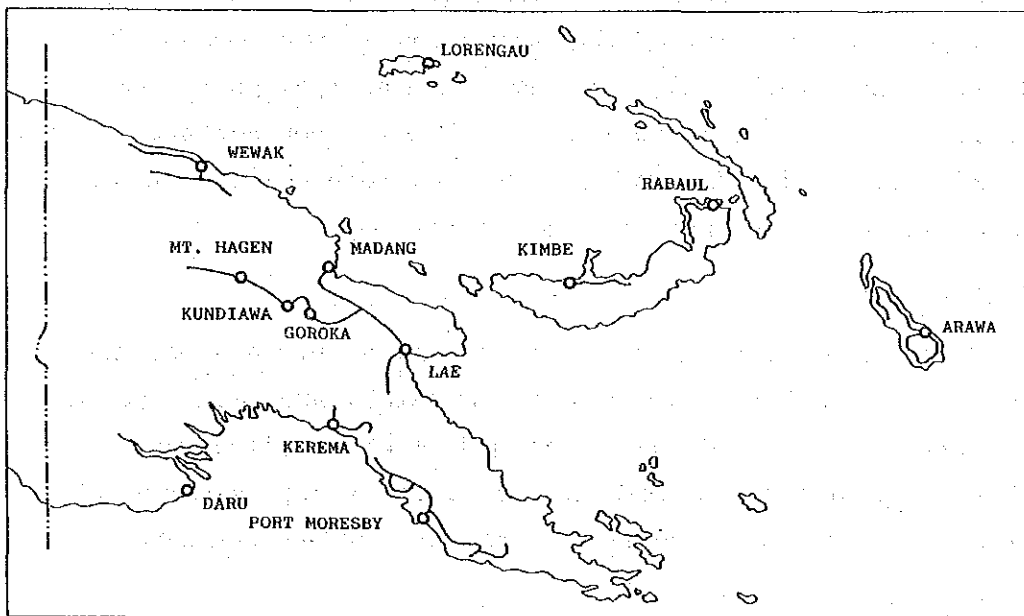


## CHAPTER III

### OUTLINE OF PROJECT AREA

#### 3.1 Project Site

Thirteen hospitals, seven health centres and three aid posts have been surveyed for implementation of the project. The project sites can be roughly divided into 3 areas: coastal, highland and islands. The following map shows these sites:



#### 3.1.1 General Situation

##### (1) Transportation

The roads have not been sufficiently constructed between cities and towns except for some areas such as Lae, Madang, Goloka, Kundiawa, Mt.Hagen, etc. connected by the highway. Transportation between regions is mainly by aircraft or boat. There are few paved roads between urban and rural areas where health centres/aid posts are located. Consequently, much attention and consideration had to be given to transportability and

resistance to shock of equipment when deciding the equipments to be supplied to such areas.

(2) Selection and Utilization of Hospital Site

Generally, health facilities are built on large sites, without topographical modifications made. Facility environments are usually quite good. As in the case of the PNG General Hospital where facilities are sprawled out over a wide site area, there are some inconveniences in movement from one hospital section to another.

(3) Water Supply

Generally, urban areas have an adequate water supply system, but in rural areas, the vast majority of the population obtains its drinking water from unprotected sources, usually streams, rivers, springs or open shallow wells. A large portion of these traditional water sources are subject to fecal contamination. In PNG, water-borne and water-related diseases are among the leading causes of morbidity and mortality.

(4) Sewerage System

The Sewerage systems in the central part of urban areas are mostly satisfactory. Public facilities such as hospitals are well equipped with sewerage systems. The study team did not make detailed survey on the sewage disposal plants in sanitation facilities etc.; however, offensive odors generated by poor drainage facilities were not encountered.

(5) Power Supply

Almost all the urban areas have access to power supply. However, in rural areas, especially in the highland provinces, grid coverage is poor and power failures often occur. In these areas, medical facilities such as health centres, aid posts etc. suffer some difficulty in providing adequate medical service as a result.

(6) Telecommunication

There are two methods of telecommunication in use. One is a wired telephone system which is nearly completed for urban areas. The other is a wireless radio system which is used in rural areas. In some medical facilities, especially health sub-centres and aid posts, there are no communication methods except mailing service, and in case of emergency, patients must be transported to facilities where telecommunication would be available in order to call a doctor or ambulance.



### 3.1.2 Status of Project Sites

Summaries on the status of medical facilities surveyed are shown in the table of the next pages.

No.	Facility	Access Road Condition	Site Environment	Drinking Water	Sewage	Power	Telephone	Others	Office Building	Ward Building	Remarks
1	Port Moresby General Hosp.	paved flat road (partially mountain road)	Coastal area 6KM from the central part of city. Nice view.	Available	partly available	Available Voltage is stable	Available Domestic Overseas	TV is available	3 stories house	One story wooden house	Operation and maintenance of supplied equipment will be no problem.
2	Angau Memorial Hosp.	paved flat road	500M from the central part of town. Nice view. Airport produces noise.	"	Available except rain draining	"	Available	Parabolic antenna used.	One story wooden house.	"	"
3	Mt. Hagen Hosp.	paved and unpaved mixed, partially flat road.	500M from the central part of town. Nice view.	"	Not available	"	"	"	One story stone house	"	"
4	Kundiawa Hosp.	"	500M from the central part of the town. Narrow site area.	Available with some problems of quantity and quality	---	"	"	"	One story wooden house	"	"
5	Goroka Hosp.	paved flat road	1KM from the central part of the town. Nice view. Hospital is well designed and maintained.	Available	Available	"	"	"	2 stories house	---	"
6	Madang Hosp.	"	3KM from the central part of the town. Hospital is nicely designed.	Available except dry season.	Draining in site is not good.	"	"	---	One story wooden house	One story wooden house	"
7	Wewak Hosp.	"	Coastal area 7KM from the central part of town. Nice view.	Available	"	"	"	---	"	"	"
8	Lorengau Hosp.	Unpaved flat road	Located on the hill of the town. Poor view. Narrow site area.	Not available (drink rain water)	Available	"	"	---	Partly one story wooden house	"	"
9	Nonga Hosp.	---	10KM from the central part of the town. Nice view.	Available	Not well equipped	"	"	Parabolic antenna used.	One story wooden house	"	"
10	Kimbe General Hosp.	paved flat road.	1KM from the central part of the town. Hospital is well designed and maintained.	"	Available	"	"	---	"	"	"

No.	Facility	Access Road Condition	Environment	Drinking Water	Sewage	Power	Telephone	Others	Office Building	Ward Building	Remarks
11	Arawa General Hosp.	paved flat road, partially mountain road	1KM from the central part of the town. Hospital is surrounded by green trees.	Available	Available	Available	Available	—	One story house	2 stories house	Operation and maintenance of supplied equipment will be no problem
12	Daru Hosp.	unpaved flat road	Located in the central part of the town. Site space is vast.	Not available (drink rain water)	"	"	"	—	One story wooden house	One story wooden house	"
13	Kerema Hosp.	Unpaved partially mountain road	Located at sloped area next to the airport.	"	"	"	"	—	"	"	Removal of deteriorated facility (X-Ray unit) will be necessary.

## 3.2 Present Situation of Medical Equipment

### 3.2.1 General Conditions of Medical Equipment

Although each hospital is furnished with normal amount of medical equipment which is at the comparable level of the equipment seen at the local hospitals in such neighbouring countries as Sri Lanka, India and Pakistan, etc. It was obvious, however, that most of the equipment was either short in number or over the limits of life, the equipment seemed necessary, therefore, to be replaced or supplimented with new equipment hastily.

#### (1) X-ray Related Apparatus

General hospitals (especially level 1) are preferentially equipped with conventional type X-ray equipment made in Japan; however, no provincial hospitals are sufficiently equipped with such. Further, the number of doctors and X-ray operators is in short supply.

Simple and small capacity X-ray apparatuses are supplied to almost all hospitals; however, some of them are out of order due to poor skills of operation and maintenance as well as to short supply of repair parts. Such equipment needs replacement.

#### (2) Operating Rooms

Standard equipment is provided for most of the existing operating rooms. Much of this equipment is out-of-date, and therefore inefficient. Many operating rooms were observed not to have, among others, enough sub-operation lamps.

In many hospitals, almost half of the automatic door closers of CSSD sterilizers are not fully operable due to technical troubles.

#### (3) Pathological Laboratories

Although Port Moresby General Hospital is conducting rather advanced and accurate diagnostic examinations compared with other hospitals in PNG, it runs short of laboratory equipment and, therefore, needs to be fully provided with such equipment.

Each provincial hospital is provided with the same medical equipment by the Government and is mainly conducting general examination by means of standardized methods.

Among all the pathological laboratory equipment, glass made water distillers and automatic door closers of CSSD sterilizers are subject to frequent trouble due to incomplete maintenance as well as to the lack of check and supply of consumables such as electric bulbs, sockets and plug receptacles. Microscopes are used in many pathological laboratories; and malarial laboratories; however, basic technological knowledge for proper operation and maintenance is lacking. This should be taken into account when a future plan for technical assistance to PNG is formulated.

(4) Obstetric Delivery

Most of the obstetric delivery tables and gynecological operating tables were old-fashioned and inefficiently functioning.

(5) Dental Instruments

Dental instruments were found to be outdated. However, dental treatment is generally being performed at highly professional levels. Basic dental operations are also being practiced.

(6) Hospital Wards

Present situation of hospital wards differs from province to province. Most wards are well arranged, maintained and managed. Some of the beds are of locally made wooden products. However, beds of surgical wards at hospitals were observed to be damaged badly and, therefore, need to be replaced.

(7) Outpatients

Number of outpatients visiting the base and provincial hospitals is 300 to 500 per day and 250 to 400 per day, respectively. Medicines are supplied by medical stores, but medicine appears to be insufficient both qualitatively and quantitatively.

(8) Management

The management system of medical services is well organized, but in order to expedite and reinforce the management system, data processing procedures need to be updated.

(9) Computers

Only Arawa Hospital makes use of a computer which is leased from Arawa Clinic.

(10) Local Medical Stores (Supplier of Equipment and Medicines to Hospitals, Health Centres and Aid-Posts)

There are 6 medical stores (Port Moresby, Mt.Hagen, Madang, Manus, Wewak and Rabaul) throughout the country. Imported medical equipment and medicines are at first unloaded at Port Moresby for customs clearance and are shipped to the district medical stores thereafter. Goods are stored and managed systematically at the medical stores, which feature cooling rooms for improved storage. Numbers of equipment maintained at medical stores, especially intermediate scale equipment such as trolley, stretcher, cabinet etc., are insufficient.

Medical equipment and medicines are supplied in a smooth manner to general hospitals, regional health centres and aid posts.

3.2.2 General Status of Equipment at Existing Medical Facilities

The data on equipment at medical facilities surveyed by the study team are shown in Table 21.

As far as the present situation of medical facilities is concerned, Port Moresby General Hospital is best equipped, followed by Angau Hospital, Kimbe Hospital and Arawa General Hospital.

Types and numbers of medical equipment presently operated in 13 medical facilities are extracted from the data collected during the survey and summarized as follows.

- X-ray Unit (Condenser Discharge Type and Mobile Type)	20
- Cobalt Therapy Unit	1
- Ultrasound Scanner (Portable)	2
- Operating Table	6
- Operation Lamp	21
- Anesthetic Instrument	7
- High Pressure Steriliser (Large and Small)	45
- Gynecological Examining Table	1
- Obstetric Delivery Table	30

- Gatch Bed for ICU	1
- Portable Defibrillator	3
- Electrocardiograph, 1-channel	3
- Laboratory Microscope	81
- Refrigerator (including those for blood and serum)	16
- Auto-analyzer	1
- Dental X-ray Unit	4
- Dental Turbin	2

The study team was unable to collect data on medical equipment furnished to health centres, health sub-centres and aid posts.

Thus existing examination, diagnosis, and clinical and basic medical science equipment is not sufficient for carrying out health and medical services in line with the policies of the government of PNG.





## **CHAPTER IV. DESCRIPTION OF THE PROJECT**



## CHAPTER IV

### DESCRIPTION OF THE PROJECT

#### 4.1 Objectives of the Project

Since its independence in 1975, the Government of PNG has put priority on equal distribution of benefit and welfare as one of its national development targets. In the social welfare sector, the Government has placed emphasis on establishing an improved and active health and medical services system, reflected in the First and Second National Health Project. The social welfare sector accordingly enjoyed the top sector-wise budget of 11.4% out of the total national budget. The Government has been extending its endeavours in increasing the number of hospitals, health centres and aid posts, setting up and reinforcing facilities, educating, assigning and training the staff who would be engaged in health and medical services such as doctors, nurses, etc., through financial and technical assistance from international organizations including International Bank for Reconstruction and Development, Asian Development Bank, World Health Organization and others. Assistance has also been forthcoming from developed countries.

The health and medical situation of the country has steadily improved in the short period of 10 years after independence by virtue of the implementation of well planned health and medical policies at the national level.

However, the level of health and medical services in PNG is still low compared with neighboring countries in terms of the numbers of medical staff, patients and beds. Accordingly, this Project is planned with an aim to achieve the National Health Project by providing adequate equipment mainly for primary and secondary health services, through assistance from the Government of Japan.

#### 4.2 Study on Request Components

##### (1) Appropriateness of the Project

The list of medical equipment requested by the Government of PNG as a grant aid project is as shown in the Section 2.7. After conducting site survey in PNG and data analyses in Japan, the study team selected the

equipment to be supplied through this Project as listed on Tables 22-28. The equipment will be allocated to 19 provincial hospitals, 468 health centres and the Examination Division of the laboratory at Port Moresby General Hospital. Therefore, this Project is expected to contribute to reinforcing medical equipment at regional facilities as planned in the Second National Health Project (1986-1990) which aims at improving the primary health service of PNG.

(2) Appropriateness of the Equipment

After making detailed studies on the list of medical equipment requested to supply by the Government of PNG taking into consideration the result of the field surveys and analysis of information and data collected, the basic design study team selected medical equipment to be supplied under the Project, which seemed to be indispensable to improve primary health services, secondary health services and technical standard of health and medical services activities, especially in rural areas of PNG. Names and reasons of equipment omitted from the supply list are indicated as below.

<u>Equipment Omitted</u>	<u>Reason for Omission</u>
1) Cobalt therapy unit	Facilities are not prepared for accepting this equipment.
2) Conventional type X-ray unit	Ministry of Health cancelled the request for supply of this equipment (PNG is planning to put the expenses concerned in its national budget).
3) I.V. drop stand	This can be manufactured in PNG. The Government of PNG consented in the meeting to endeavour to procure it at its own expenses.

(3) Appropriateness of the Staff and Budget of PNG

Since the equipment is selected and expected to be operated and maintained under almost the same level of knowledge, technology and

expenses as being executed presently, it is considered to place no additional burden on PNG interms of staff and national budget.

#### 4.3 Outline of the Project

##### 4.3.1 Implementation Agency and Organization

Ministry of Health (MOH) of PNG is the implementation agency of the Project.

A coordinator in each administration office handles the coordination with financing institution(s), preparation of progress reports, supervision of consultants, and evaluation and monitoring of the Project. In addition, another coordinator oversees the financial matters. Reports from these coordinators are to be submitted to the Secretary of Health who is in effect a Project Manager.

##### 4.3.2 Selected Equipment for the Project

Facilities to be reinforced and equipment to be supplied under this Project are as follows:

(1) Facilities (see Map of Papua New Guinea for locations)

- 1) Port Moresby General Hospital
- 2) Lae Base Hospital
- 3) Madang Provincial Hospital
- 4) Mt. Hagen Base Hospital
- 5) Rabaul Base Hospital
- 6) Kimbe Provincial Hospital
- 7) Manus Provincial Hospital
- 8) Wewak Provincial Hospital
- 9) Goroka Base Hospital
- 10) Arawa Provincial Hospital
- 11) Kundiawa Provincial Hospital
- 12) Daru Provincial Hospital
- 13) Kerema Provincial Hospital