

**BASIC DESIGN STUDY REPORT
ON
DISTRICT HOSPITALS RECONSTRUCTION PROJECT
IN
WESTERN SAMOA**

April 1983

JAPAN INTERNATIONAL COOPERATION AGENCY

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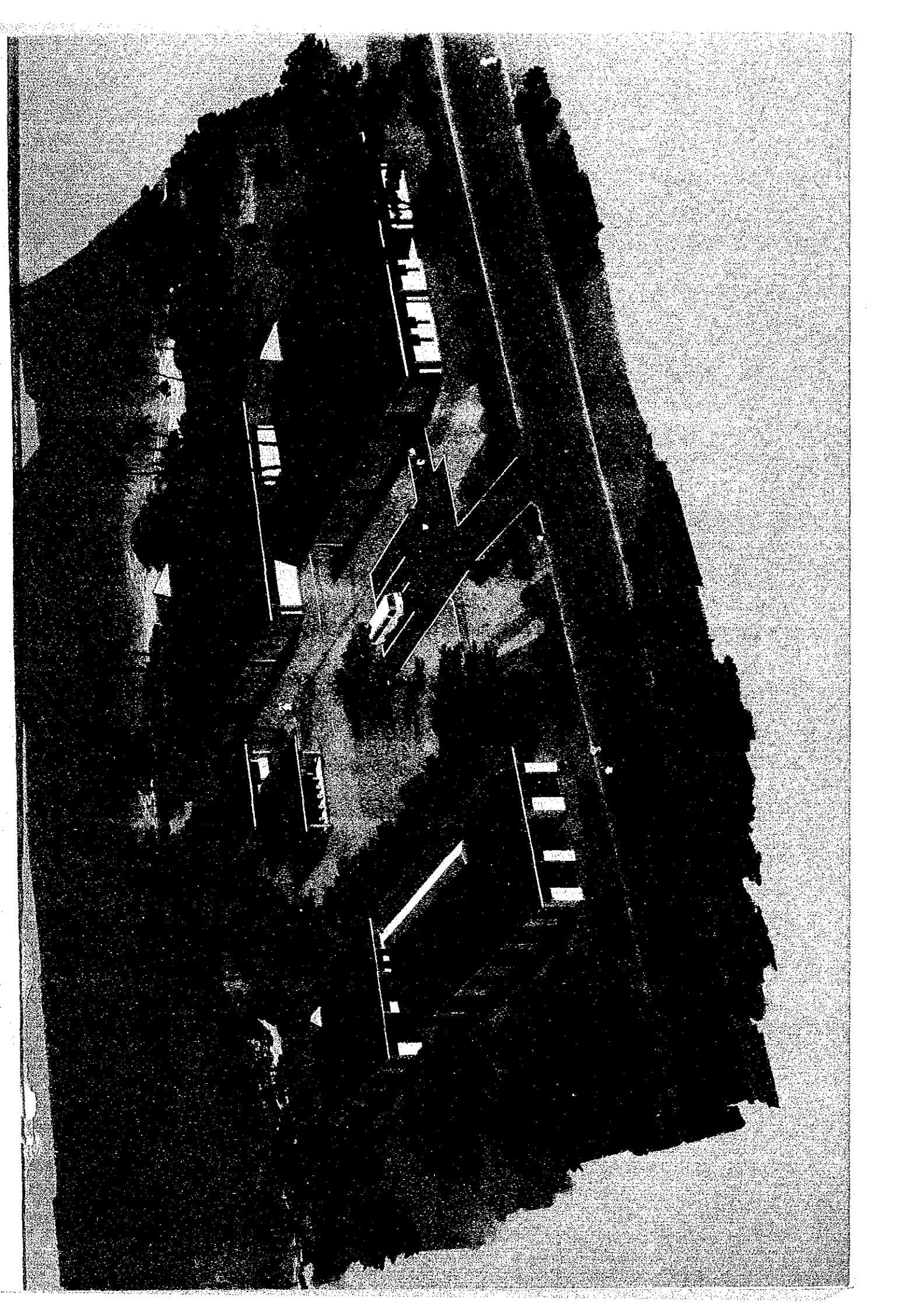


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April 1983

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to the request of the Government of Western Samoa, the Government of Japan decided to conduct a Basic Design Study on the District Hospitals Reconstruction Project and entrusted the survey to the Japan International Cooperation Agency (JICA). The J.I.C.A. sent to Western Samoa a survey team headed by M.D. Ikuhiro YAMASAWA, The 2nd Department of Internal Medicine, Tokyo Medical Collage from 17th January to 6th February, 1983.

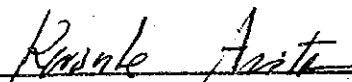
The team had discussions with the officials concerned of the Government of Western Samoa and conducted a field survey (in Leulumoega and Sataua).

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 Western Samoa for their close cooperation extended to the team.

April , 1983

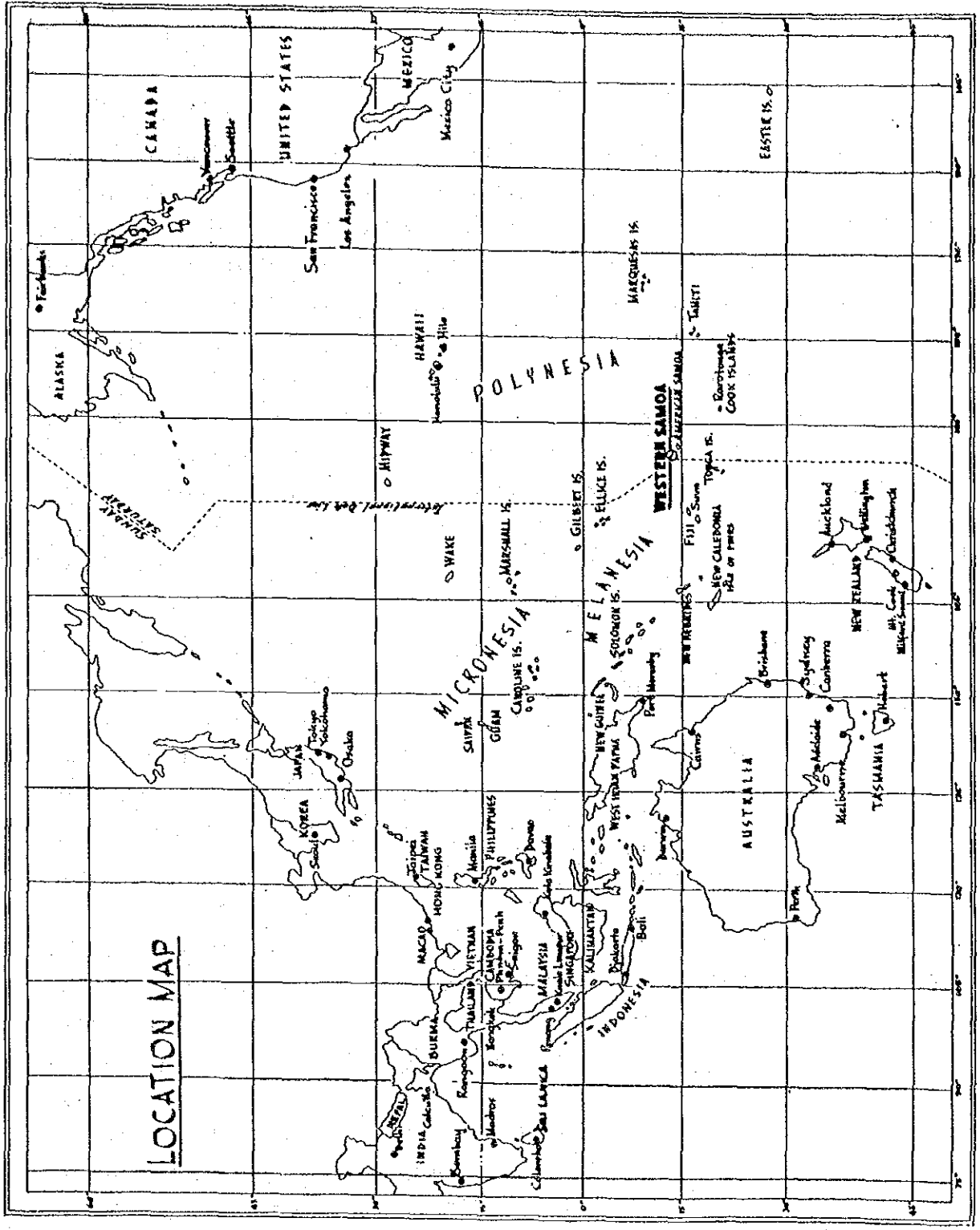


Keisuke Arita

President

Japan International Cooperation Agency

LOCATION MAP



SUMMARY

The Government of Western Samoa is enforcing its 4th five-year plan started in 1980, providing various kinds of projects.

In the field of health, it is proposed to upgrade the district hospitals improving quality and extending the range of services so that most cases should be dealt with at the district hospital level, referrals to the National Hospital in Apia being kept to a minimum.

Faced with limited resources and many development constraints, the Government of Western Samoa has requested the Government of Japan for a grant to upgrade two existing hospitals, one in Leulumoega district on Upolu island and one in Sataua district on Savaii island.

In response to the request, the Government of Japan sent a survey team to Western Samoa from January 17, to February 6, 1983. The team carried out field surveys and exchanged views with the officials concerned of the Government of Western Samoa. After further careful studies in Japan, the team has prepared the present report.

Like most developing countries, it is essential for Western Samoa to improve primary health care in local villages. The proposed district hospitals will also play an important role in this field. The district nurses, who are dealing with primary health care in villages, use the district hospitals as their base and maintain records and supplies in their own rooms.

Besides, the proposed hospitals are playing additional important roles; the Leulumoega hospital located near Faleolo, the nations only international airport, is responsible for conducting emergency medical care, should an aircraft accident occur. The Sataua hospital located near a new industrial plantation is expected to treat an increasing number of patients with occupational diseases and/or other problems.

The specific services rendered should be limited to easy ones but should cover a wide range such as Internal Medicine, Pediatrics, Surgery and ENT and Obstetrics and Gynecology.

However, the survey team has found that the actual conditions of the existing facilities of the proposed hospitals are so poor that they would hardly fulfil their function without taking thorough measures, and that all the existing facilities should be demolished and reconstructed with adequate medical equipment installed.

The buildings were designed to be one stories and to have a total floor area of 2363.1m²; 1135.47m² for Leulumoega and 1227.63m² for Sataua respectively. Each proposed hospital is planned to be composed of the following blocks;

- a) Clinic Block
with an examination room, a dressing room, a laboratory, a small operation theater, a delivery room, reception rooms for inspector and district nurses, etc.,
- b) Ward
with 2 - 10 bedrooms, 2-single maternity rooms, and a single room for intensive observation etc.,
- c) Doctors' Rest Room Unit
with rest rooms for a doctor and an inspector, a meeting room, library, etc.,
- d) Nurse Training Unit
with nurses' rooms, a lecture room and a library, etc.,
- e) Patient Relatives' Fale
- f) Kitchen and Laundry

The medical equipment for the proposed hospitals is to be limited to such models as require minimum energy consumption and easy training for operation. Considering the roles played by the proposed hospitals and the local medical conditions, an ambulance and a land-cruiser are also provided for each hospital.

This report suggests that most of the Construction works are to be covered by the grant of the Government of Japan, but such works as the demolition of the existing facilities, works outside of the hospital compound, gardening, general furniture, etc., are to be covered by the Government of Western Samoa.

The buildings being so designed as to use as many local materials as possible, most of the construction materials and services will be procured from the local market or from New Zealand.

The period for detailed design and construction work is estimated to be about twelve months after the exchange of notes between the Government of Western Samoa and the Government of Japan.

After completion, the facilities are to be operated and managed by the staff of the existing hospital (and an additional X-ray engineer for Sataua hospital) for the moment, but within five years, the patient load will reach the limit of capacity with the present staff.

In order to make the proposed hospitals functional enough, it is essential to secure not only adequate financial support but also enough manpower resources for the operation of the facilities.

We recommend that the execution of the proposed hospitals' reconstruction project is proper and adequate, and that adoption of the grant for the project by the Government of Japan is urgent.

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- I. Members of Survey Team
- II. Schedule of Survey
- III. Cooperators in Survey
- IV. Minutes
- V. Members of Survey Team (Explanation or Draft Report)
- VI. Schedule of Explanation on Draft Report
- VII. Minutes

Chapter 1 Introduction

The Government of Western Samoa is enforcing its 4th five-year plan started in 1980. The plan provides key projects in such fields as rural development, education, technical training, health, the environment, culture and basic infrastructure.

As one of the projects in the field of health, it is proposed to upgrade the district hospitals improving quality and extending the range of services so that most cases should be dealt with at district hospital level, referrals to the National Hospital being kept to a minimum.

Faced with limited resources and many development constraints, it would be hard for Western Samoa to go in its development effort without the technical and financial support provided by the international community.

Hence the Government of Western Samoa has asked The Government of Japan for a grant to upgrade two existing hospitals in Leulumoega district and Sataua district.

In response to the request, The Government of Japan decided to conduct a survey on the project, and sent a survey team to Western Samoa from January 17 to February 6, 1983. The team conducted field survey and exchanged views with the officials concerned of the Government of Western Samoa. After further careful studies in Japan, the team has prepared the present report.

The names of the staff, and schedule of the survey team and the minutes are attached in the appendix.

Chapter 2 Background

2.1 Medical Conditions

The general standard of health in Western Samoa is not so bad as compared with those of other developing countries with life expectancy of about 61 and 63 for male and female respectively in 1981. There are 56 doctors and 680 hospital beds in the country. The population-doctor, population-hospital beds ratios are 2823.75:1 and 232.5:1 respectively. The figures in Japan are 773:1 and 92:1 respectively.

Ten leading cause of notifiable diseases reported in the country in 1981 are (1) Influenza, (2) Gastro enteritis, (3) Unclassified diarrhoea, (4) Infantile diarrhoea, (5) Mumps, (6) Fish poisoning, (7) Gonorrhoea, (8) Chicken pox, (9) Infectious hepatitis and (10) Measles. With the exception of infectious hepatitis, the rest of them are not very serious. Rather, disastrous tuberculosis and leprosy are reported in minor cases. The cases of diarrhoea which is one of the most important causes of infant mortality, are great in number in the country. It is pointed out that much attention should be exercised on the hygiene, sanitation, water supply facilities and sewage disposal in rural areas. With recent remarkable industrial development in Sataua and its vicinities, problems of occupational health have been increasing. It is also pointed out that measures should be taken to cope with these problems.

Basic information concerning general medical conditions in Western Samoa are as follows:

Table 2.1.1 BASIC COUNTRY HEALTH INFORMATION (1981)

1.	Land Areas in Western Samoa	-	1093 sq.miles
2.	Number of villages	-	362
3.	Population in 1981 (Census)	-	158,130
4.	Percent urban population	-	29%
5.	Annual rate of population growth	-	0.8
6.	Expectation of Live at birth	-M	61
		F	63
7.	Population under 1 year	Number	4,744
		Percentage	3%
8.	Population under 5 years	Number	20,557
		Percentage	13%
9.	Population under 15 years	Number	76,219
		Percentage	42.2%
10.	Female population 15 - 45 year	Number	31,626
		Percentage	20%
11.	Population 65 years and over	Number	7,180
		Percentage	4.5%
12.	Crude Birth rate (CBR)	-	37.4
13.	Crude Death rate (CDR)	-	7
14.	Infant Mortality rate (IMR)	-	35
15.	Maternal Death rate (MDR)	-	1
16.	Number of Hospitals in Western Samoa	-	<u>31</u>
	- National Hospital - (1)		
	- District Hospital - (7)		
	- Health Centres - (9)		
	- Sub-centres - (14)		
17.	Number of Hospital Beds	-	680
	- National Hospital	-	335
	- Hospitals - rural Upolu	-	191
	- Hospitals - Savaii	-	154
18.	Number of medical doctors in Western Samoa	-	56
	- National Hospital - (29)		
	- Upolu Hospital - (8)		
	- Savaii Hospital - (7)		
	- Public Health - (4)		
	- Private Practice - (7)		
	- Director General - (1)		
19.	Number of Nurses in Western Samoa	-	446
	- National Hospital - (152)		
	- Upolu Hospital - (22)		
	- Savaii Hospital - (28)		
	- Public Health Nurses - (62)		
	- Student Nurses - (100)		
	- Nurse Aids - (82)		

20.	Number of dental staffs in Western Samoa	-	31
	- National Hospital	- (27)	
	- Upolu rural	- (-)	
	- Savaii Island	- (4)	
21.	Pharmacy staff	-	16
	- National Hospital	- (12)	
	- Upolu rural	- (0)	
	- Savaii Island	- (4)	
22.	National Medical Laboratory	-	30
	- National Hospital	- (27)	
	- Upolu rural	- (1)	
	- Savaii	- (2)	
23.	X-ray Service	-	17
	- National Hospital	- (17)	
	- Savaii Island	- (1)	
	- Upolu rural	- (0)	
24.	Health Inspectors in Western Samoa	-	18
	- Main Office	- (7)	
	- Upolu rural	- (1)	
	- Savaii Island	- (1)	
	- Trainee (training)	- (9)	
25.	Medical Record Service	-	27
26.	Health Planning and Statistical Service	-	3
27.	Health Education Service	-	2
28.	Dietition/Nutritionist Service	-	2
29.	Orthopaedic Staff (National Hospital)	-	2
30.	Sewing Staff	" "	16
31.	Laundry Staff	" "	26
32.	Kitchen Staff	" "	30
33.	Maintenance Staff	" "	48
34.	Drivers	" "	
35.	Administration Staff	-	22
	- Typist	- (8)	
	- Accounts	- (7)	
	- Salaries	- (4)	
	- Administrative	- (1)	
	- Transport Officer	- (1)	
	- House Manager	- (1)	
36.	Occupational Therapy	-	2
37.	Physiotherapy Staff	-	2

Note: Health Department urban area, refer to villages surrounding the Apia National Hospital, from Apia to Luatuanuu to the East and Apia to Faleula to the West.

Table 2.1.2 REPORTED CASES OF NOTIFIABLE DISEASES INCIDENCE RATE PER (100,000 WESTERN SAMOA 1981)

I.C.D. Number	Disease	Number	Incidence Rate
002	Typhoid Fever	11	6.9
009	Infantile Diarrhoea	283	178.9
009	Gastro Enteritis	642	405.9
009	Unclassified Diarrhoea	614	388.2
011	Tuberculosis	32	20.2
052	Chickenpox	110	69.5
055	Measles	72	45.5
061	Dengue Fever	19	12.0
072	Mump	184	116.3
098	Gonorrhoea	128	80.9
320	Meningitis	26	16.4
487	Influenza	9639	6095.6
573	Infectious Hepatitis	76	48.0
988	Fish Poisoning	156	98.6
988	Food Poisoning	29	18.3

SOURCE: OUTPATIENT CONSULTATION REGISTER

Table 2.1.3 TEN LEADING CAUSE OF NOTIFIABLE DISEASE AND INCIDENCE RATE PER (100,000 Popn.) WESTERN SAMOA 1981

Number	Disease	Number	Incidence Rate
1	Influenza	9639	6095.6
2	Gastro Enteritis	642	405.9
3	Unclassified Diarrhoea	614	388.2
4	Infantile Diarrhoea	283	178.9
5	Mump	184	116.3
6	Fish Poisoning	156	98.6
7	Gonorrhoea	128	80.9
8	Chickenpox	110	69.5
9	Infectious Hepatitis	76	48.0
10	Measles	72	45.5

Table 2.1.4 NUMBER OF INPATIENTS, PATIENT DAYS, AVERAGE LENGTH OF STAY IN NATIONAL AND DISTRICT HOSPITALS, WESTERN SAMOA 1981

I.C.D. Code	Disease	Cases	Patient Days	Average Stay
01-55	Grand Total	<u>11,796</u>	<u>97,449</u>	<u>8.3</u>
01	Intestinal infectious disease	429	2,530	6.0
02	Tuberculosis	70	2,242	32.0
03	Other bacterial disease	50	1,357	22.6
04	Viral Disease	77	348	4.5
07	Other infectious and parasitic diseases	82	509	6.2
08	Malignant Neoplasm of lip and cavity and pharynx	1	9	9.0
09	Malignant Neoplasm of digestive organs and peritoneum	28	244	8.7
10	Malignant Neoplasm of respiratory and intrathoracic Organs	3	63	21.0
11	Malignant Neoplasm of bone connective tissue skin and breast	22	352	16.0
12	Malignant Neoplasm of genitourinary organs	21	196	9.3
13	Malignant of other and unspecified sites	12	215	18.0
14	Malignant Neoplasm of Lymphatic and Haemopoietic tissue	17	287	17.0
15	Benign Neoplasm	14	83	6.0
16	Other and Unspecified Neoplasm	26	291	11.2
17	Endocrine and Metabolic disease. Immunity disorder	213	3,243	15.2
18	Nutritional deficiencies	49	662	13.5
19	Diseases of blood and blood forming organs	35	418	12.0
20	Mental Disorder	104	2,747	26.4
21	Diseases of Nervous System	220	2,242	10.2
22	Disorders of eye adnexa	60	615	10.2
23	Disease of the ear and Mastoid process	44	267	6.0
24	Rheumatic Fever and Rheumatic Heart disease	43	460	10.7
25	Hypertensive disease	167	1,636	10.0
26	Ischaemic Heart Disease	12	37	3.0
27	Disease of Pulmonary circulation and other forms of Heart Disease	270	5,035	18.6
28	Cerebrovascular Disease	64	1,163	18.2
29	Other diseases of the circulatory system	28	193	7.0
30	Disease of the Upper Respiratory Tract	159	862	5.4

I.C.D. Code	Disease	Cases	Patient Days	Average Stay
31	Other diseases of the Respiratory System	2,648	23,418	9.0
32	Diseases of oral cavity	16	117	7.3
33	Disease of the other parts of the Digestive System	866	12,059	14.0
34	Disease of Urinary System	122	843	7.0
35	Diseases of Male genital organs	118	1,205	10.5
36	Diseases of female genital organs	207	1,345	6.5
37	Abortion	231	897	4.0
38	Direct Obstetric Causes	375	2,298	6.1
39	Normal Delivery	2,270	5,906	3.0
40	Diseases of skin and subcutaneous tissue	539	6,474	12.0
41	Diseases of the musculoskeletal system and Connective tissue	241	2,628	11.0
42	Congenital Anomalies	34	237	7.0
43	Certain conditions originating in the perinatal period	67	456	7.0
44	Signs Symptoms and ill defined condition	649	3,275	5.0
45	Fractures	276	3,632	13.2
46	Dislocations, Sprains and strains	31	213	7.0
47	Intracranial and internal injuries	106	426	4.0
48	Open wounds and injury to blood vessels	312	1,693	5.4
49	Effects of foreign body entering through orifice	6	36	6.0
50	Burns	51	355	7.0
51	Poisoning and toxic effect	138	734	5.3
52	Other injuries, early complication of trauma	173	896	5.2

Table 2.1.5 PATIENT DAYS, AVERAGE LENGTH OF STAY, BED OCCUPANCY RATE, INPATIENT DEATHS IN HOSPITAL, OUTPATIENT ATTENDANCE : WESTERN SAMOA 1981

Health Districts	Discharges	Patient Days	Average Length of stay	% Bed Occupancy	Inpatient Deaths	Hospital Delivery	Outpatients
<u>National Hospital</u>	<u>7,332</u>	<u>77,783</u>	<u>11.0</u>	<u>63.6</u>	<u>290</u>	<u>1936</u>	<u>68,607</u>
<u>Upolu Rural</u>	<u>2,127</u>	<u>9,173</u>	<u>4.3</u>	<u>13.1</u>	<u>26</u>	<u>144</u>	<u>62,900</u>
Afega	332	1,508	4.5	16.5	1	3	9,922
Aleipata	289	1,225	4.2	14.0	4	29	6,417
Fagaloa	21	104	4.9	2.8	-	2	1,306
Falelatai	2210	809	3.8	7.4	1	17	6,852
Fusi	291	1,278	4.4	13.5	3	18	8,792
Lefaga	355	1,544	4.3	17.6	5	30	5,956
Leulumoega	251	1,092	4.3	24.9	10	12	11,866
Lufilufi	114	463	4.1	12.7	1	2	7,283
Poutasi	264	1,150	4.3	10.5	1	31	4,506
<u>Savaii</u>	<u>2,337</u>	<u>10,493</u>	<u>4.5</u>	<u>15.9</u>	<u>74</u>	<u>172</u>	<u>35,719</u>
Fagamalo	205	915	4.5	12.5	6	19	4,236
Palaulii Sisifo	217	939	4.3	8.6	7	24	5,303
Safotu	202	979	4.8	11.2	4	18	2,452
Sataua	453	2,062	4.5	17.9	16	29	7,309
Satupaitea	210	865	4.1	9.9	3	14	4,361
Tuasivi	1,050	4,733	4.5	25.9	38	68	12,058

SOURCE: MEDICAL RECORDS AND INPATIENT REGISTER

Table 2.1.6 REQUESTED DEATHS BY CAUSE INCLUDING
STILL-BIRTHS AND SEX : WESTERN SAMOA 1981

Code	Cause of Death	Male	Female	Total
	GRAND TOTAL	275	170	445
01-07	Infections and Parasitic Disease	-	3	8
01	Intestinal infectious diseases	4	4	8
02	Tuberculosis	3	2	5
037	Tetanus	1	-	1
038	Septicaemia	-	2	2
08-14	Malignant Neoplasms	9	2	11
17	Other and unspecified Neoplasm	8	6	14
091	Malignant Neoplasm of stomach	1	1	2
094	Malignant Neoplasm of rectum, rectosigmoid junction and anus	-	1	1
101	Malignant Neoplasm of trachea, bronchus and lung	2	-	2
113	Malignant Neoplasm of female breast	-	3	3
141	Leukaemia	-	1	1
181	Diabetes Mellitus	7	7	14
191	Nutritional Marasmus	-	1	1
192	Other protein calorie Malnutrition	1	2	3
220	Meningitis	2	4	6
25-30	Diseases of the Circulatory System	36	19	55
251	Chronic Rheumatic Heart Disease	1	1	2
26	Hypertensive Disease	3	4	7
27	Ischaemic Heart Disease	2	-	2
270	Acute Myocardial infraction	12	4	16
29	Cerebrovascular Disease	19	9	28
321	Pneumonia	15	7	22
323	Bronchitis, emphysema and asthma	6	3	9
341	Ulcer of Stomach and duodenum	7	2	9
347	Chronic Liver disease and Cirrhosis	13	1	14
350	Nephritis, Nephrotic Syndrome and Nephrosis	22	17	39
46	Certain conditions originating in the perinatal period	7	1	8
46	Signs, Symptoms and ill defined conditions	54	45	99
47	Fractures	1	-	1

Code	Cause of Death	Male	Female	Total
49	Intracranial and internal injuries including nerves	14	4	18
50	Open wounds an injury to vessels	2	-	2
52	Burns	-	1	1
53	Poisonings and Toxic effect	2	3	5
	Herbs poisoning	6	2	8
	Paraquat poisoning	7	6	13
	Kerosene poisoning	-	1	1
55	Drowning	6	1	7
E47	Motor vehicle Traffic Accidents	1	-	1
E54	Suicide	1	-	1

SOURCE: JUSTICE DEPARTMENT

2.2 Medical Administration

In Western Samoa, the Department of Health is responsible for its medical administration. The structure of the organizations concerned is illustrated in Fig. 2.2.1.

The country is divided into 14 districts, each of which is served by a District Hospital or a Health Center. The District Medical Officer is responsible for curative and preventive services in the district. Normally he is a doctor and has several nurses, a Labo. Technician and Inspector as his staff.

The National Hospital (with 335 beds) in Apia, capital of Western Samoa, is at the highest level in medical services in the country, and receives serious patients who can not expect enough medical treatment at the district level. The problem is that the burdens on the National Hospital, patients themselves and their families are considerable.

As for lower levels of medical facilities, there are the Health Centers and Sub-Centers without having doctors on full-time basis in them. These Centers are generally operated by junior officers, and traveling doctors only visit them from time to time. These organizations are governmental and operated under the supervision of the Department of Health. The Women's Committee should be noted when discussing the medical services in Western Samoa. It features the medical system of the country. It is not too much to say that medical facilities in local and district level do not function sufficiently and properly without cooperation of the Women's Committee.

As is often the case with most of the developing countries, it is more necessary to improve primary health care of the country, rather than to merely bring in up-to-date and sophisticated medical techniques and equipment. The health Aids who are selected by the Women's Committee and trained by the Department of Health, are directly involved in such activities in villages.

District Hospitals have several District Nurses who conduct and advise the Health Aids, visiting each village in the district. The job of the District Nurses involves training Health Aids, taking care of hygiene of mothers and children, and assisting health education in the district.

The Women's Committee's activities also cover the part of maintenance of District Hospitals. Normally it has its offices around the entrance of the District Hospital.

Figure 2.2.1.1 ORGANIZATION CHART: HEALTH DEPARTMENT 1979 (2)

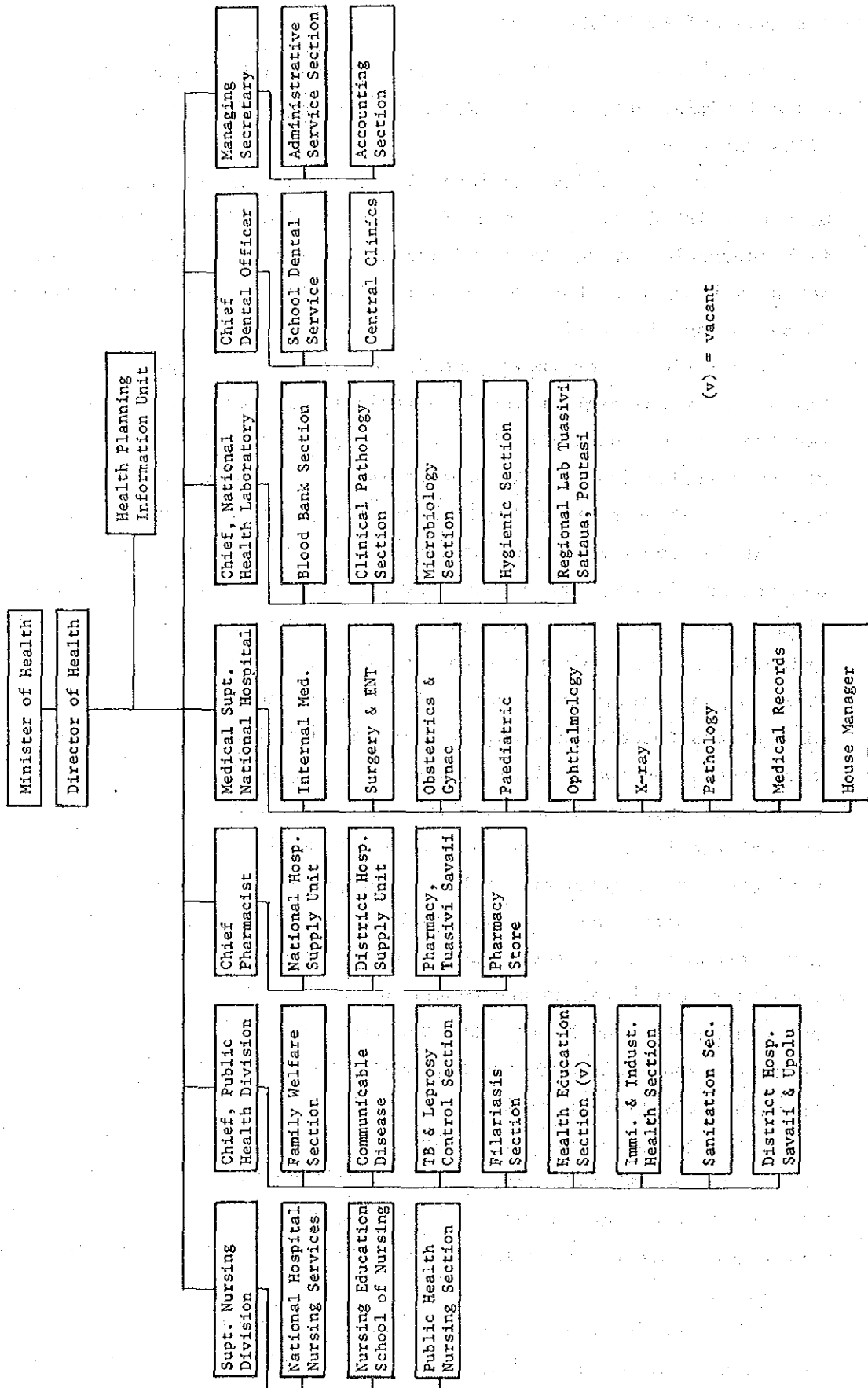


Fig. 2-2-2

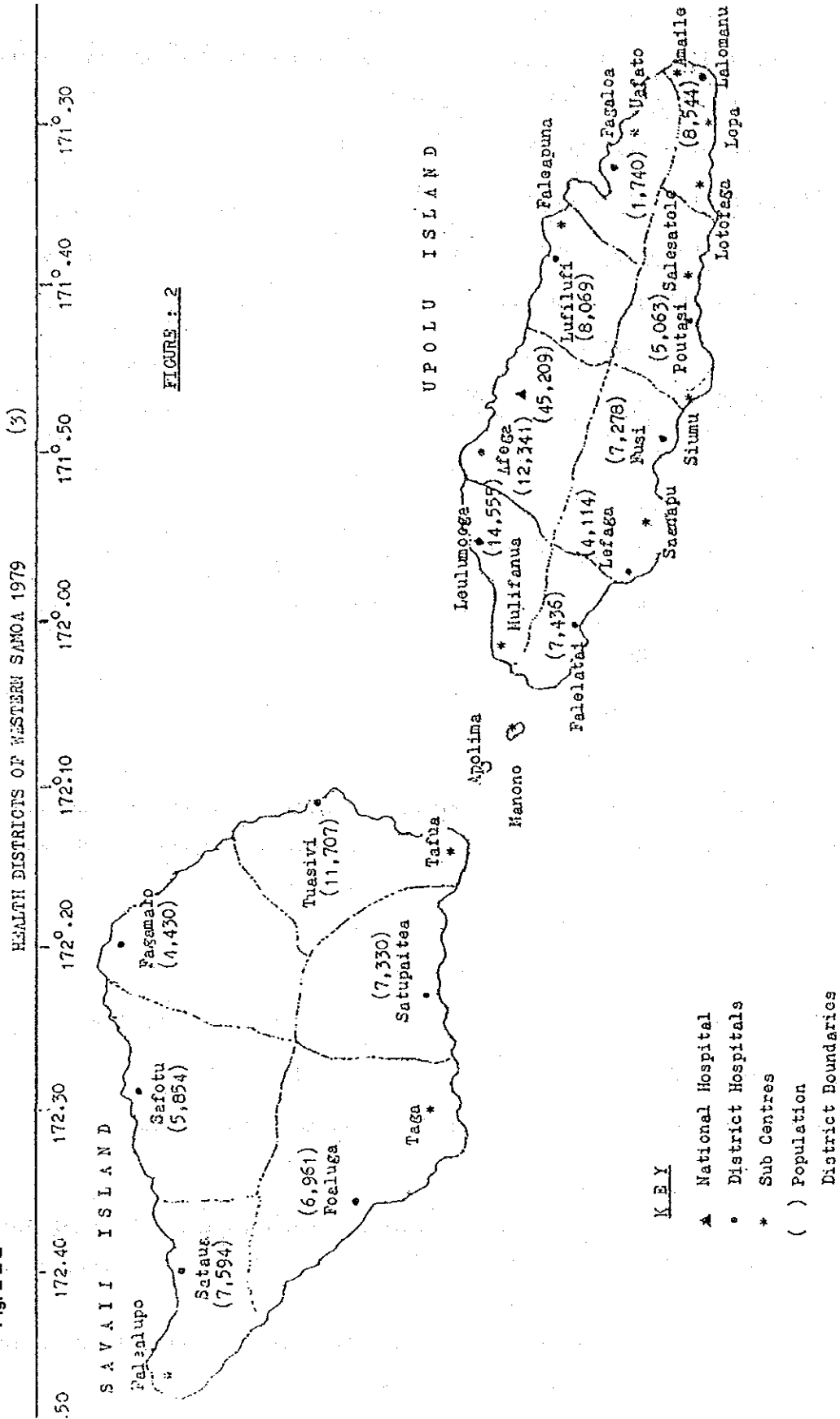


FIGURE : 2

2.3 National Medical Projects

The medical and health projects in the Fourth 5-year Development plan under way since 1980 are as follows:

- (1) South Pacific Pharmaceutical Service
- (2) Primary Health Care
- (3) Family Welfare and Nutrition
- (4) Environmental Sanitation
- (5) Physician Assistant
- (6) Health Manpower Development
- (7) Health Education
- (8) Dental Health Service
- (9) Control of Communicable Diseases
- (10) Control of Non-communicable Diseases
- (11) National Hospital
- (12) District Hospital
- (13) National Laboratory

These have been enforced and developed in connection with one another. The content of (12) District Hospital project is as follows:

2.3.1 District Hospital Project

- (1) Headquarters : Health Department
- (2) Project Manager : Chief, Division of Public Health
- (3) Present situation : Ongoing with aid sought
- (4) Place : Savaii Island and Upolu rural
- (5) Objective

The objective of the project is to improve the District Hospitals, thus minimizing the number of patients transferred to the National Hospital.

It is scheduled to improve the District Hospitals in Tuasivi, Sataua, Leulumoega and Poutasi.

(6) The estimates for each item and fiscal year (at the price index in 1979, in 1000 TALA)

	1980	1981	1982	1983	1984	Total
Construction	25.0	90.0	60.0	60.0	90.0	325.0
Equipment furniture	20.0	60.0	40.0	40.0	60.0	220.0
Total	45.0	150.0	100.0	100.0	150.0	545.0
Foreign exchange	31.0	102.0	68.0	68.0	102.0	371.0
Local cost	14.0	48.0	32.0	32.0	48.0	174.0
Aid sought/expected	45.0	150.0	100.0	100.0	150.0	545.0
Local funds	-	-	-	-	-	-

Chapter 3 District Hospitals Reconstruction Project

3.1 Request

In connection with the District Hospitals Reconstruction Project in the fourth 5-year Development Plan, the Government of Western Samoa has made a request to the Japanese Government for a grant aid to reconstruct two of its District Hospitals; Leulumoega and Sataua.

The content of the request is as follows:

(1) Leulumoega District Hospital

The Hospital is located approximately 30km north-west of Apia, the capital. The district includes 11 villages and 7 plantations. As faleolo International Airport is also in this district, the Hospital is responsible to cure injured persons for emergency medical activity in case of airplane accidents. Thus it is one of the most important District Hospitals in Upolu rural.

(2) Sataua District Hospital

The hospital is located near the west end of Savaii Island, and is an important hospital functioning as a key-medical facility together with Tuasivii District Hospital on the east end of the Island. As this district includes a new industrial park under development, the Hospital is expected to offer medical services to workmen injured in the plantation (which have been increasing recently).

Now the District Hospitals are poorly equipped whereas the importance of these facilities has been increasing and recognized. Therefore, the request has been made by the Western Samoan Government in need of coping with these problems in the shortest possible time.

3.2 Actual conditions of Existing Facilities

3.2.1 Site

(1) Leulumoega District Hospital (Refer to the Drawings: 3.2.1, 3.2.2)

The Hospital is facing the West Coast Road which links Apia and Faleolo International Airport, and is about 30km away from Apia and several kilometers from the Airport.

The size of the site is approximately 75m in depth and 70m in width between the West Coast road and sea. On the sea side is about 2m deep cliff. The surface of its site is sandy soil made of weathered lava bed. Surroundings: Typical farm land

(2) Sataua District Hospital (Refer to the Drawings: 3.2.3, 3.2.4)

The Hospital is located at the west end of the Savaii Island, the largest island in Western Samoa and approximately 6km west of Asau seaport. A main loop road on the circumference of the Island is passing through the site of the Hospital. The project aims to reconstruct on the northern part of the site, the upper part of the road. The size of the site is approximately 90m in depth and 90m in width. As a lava bed is exposed, the land must be solid enough but excavation work would not be easy.

Surroundings: Forestry

3.2.2 Climate

According to the data on climate in Faleolo and Asau, both of which are in the vicinities of Leulumoega and Sataua respectively. The climate is a sub-tropical one with much rainfall and high temperature and humidity.

The annual average temperature is between 26°C - 27°C. The average temperature in January and July are between 27°C - 28°C. The annual average humidity is 74% - 80%. The figures in January and July are 78% - 86% and 72% - 81% respectively. The differences of temperatures and of humidities are small.

With regard to precipitation, the difference is considerable in averages. The annual precipitation is about 2000 - 3000mm and its figures in January and July are 300 - 400mm and 40 - 190mm respectively. The winds are from north-east to south-west throughout the year.

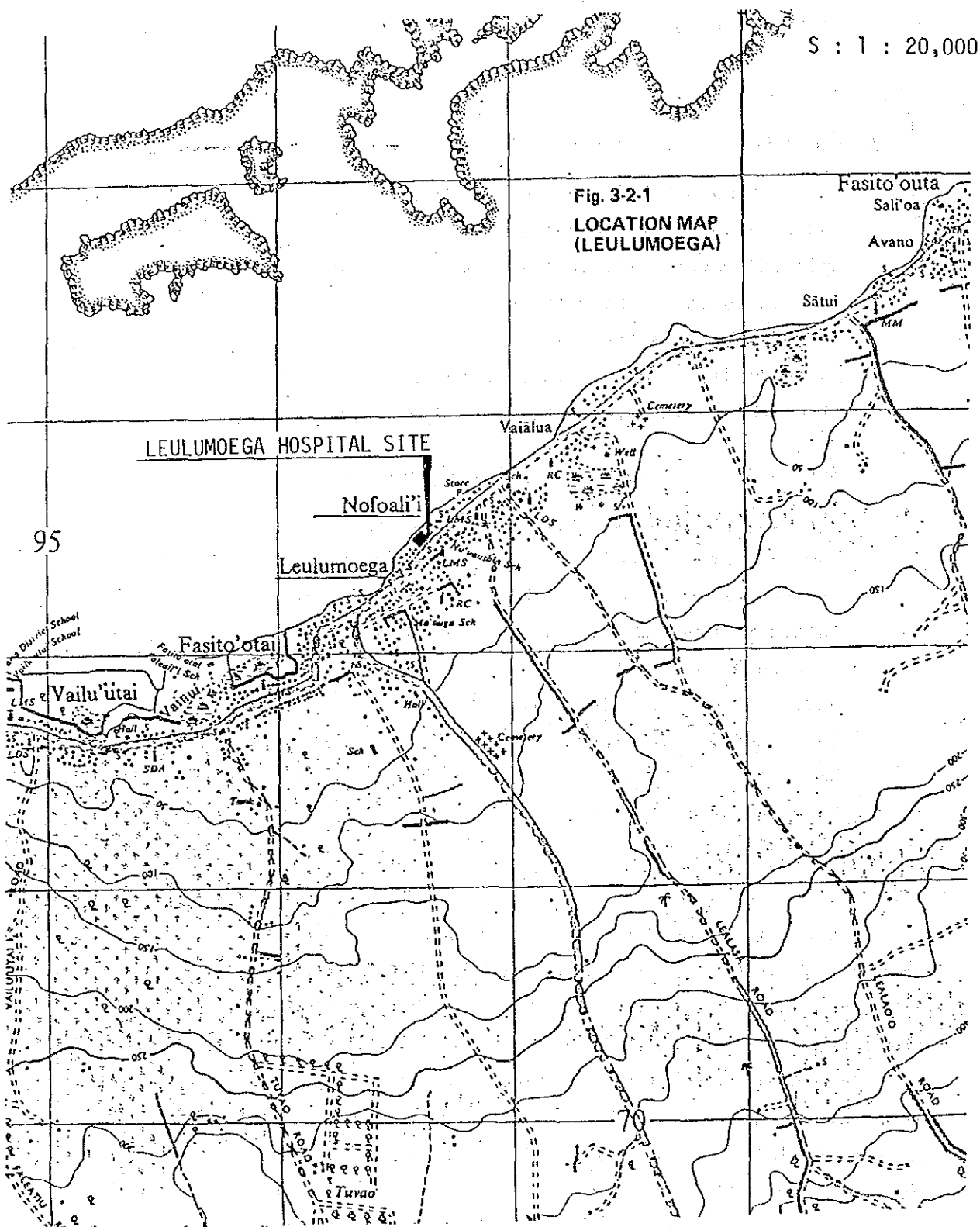


Fig. 3-2-1
LOCATION MAP
(LEULUMOEGA)

S : 1 : 20,000

95

LEULUMOEGA HOSPITAL SITE

Nofolai'i

Leulumoega

Vailu'utai

Fasito'otai

Vaiulu'utai

Fasito'outa

Sali'oa

Avano

Sātui

Cemetery

Store

LMS

RC

Well

Cemetery

Hall

Sch

Tunk

Tuvao

MM

PACIFIC OCEAN

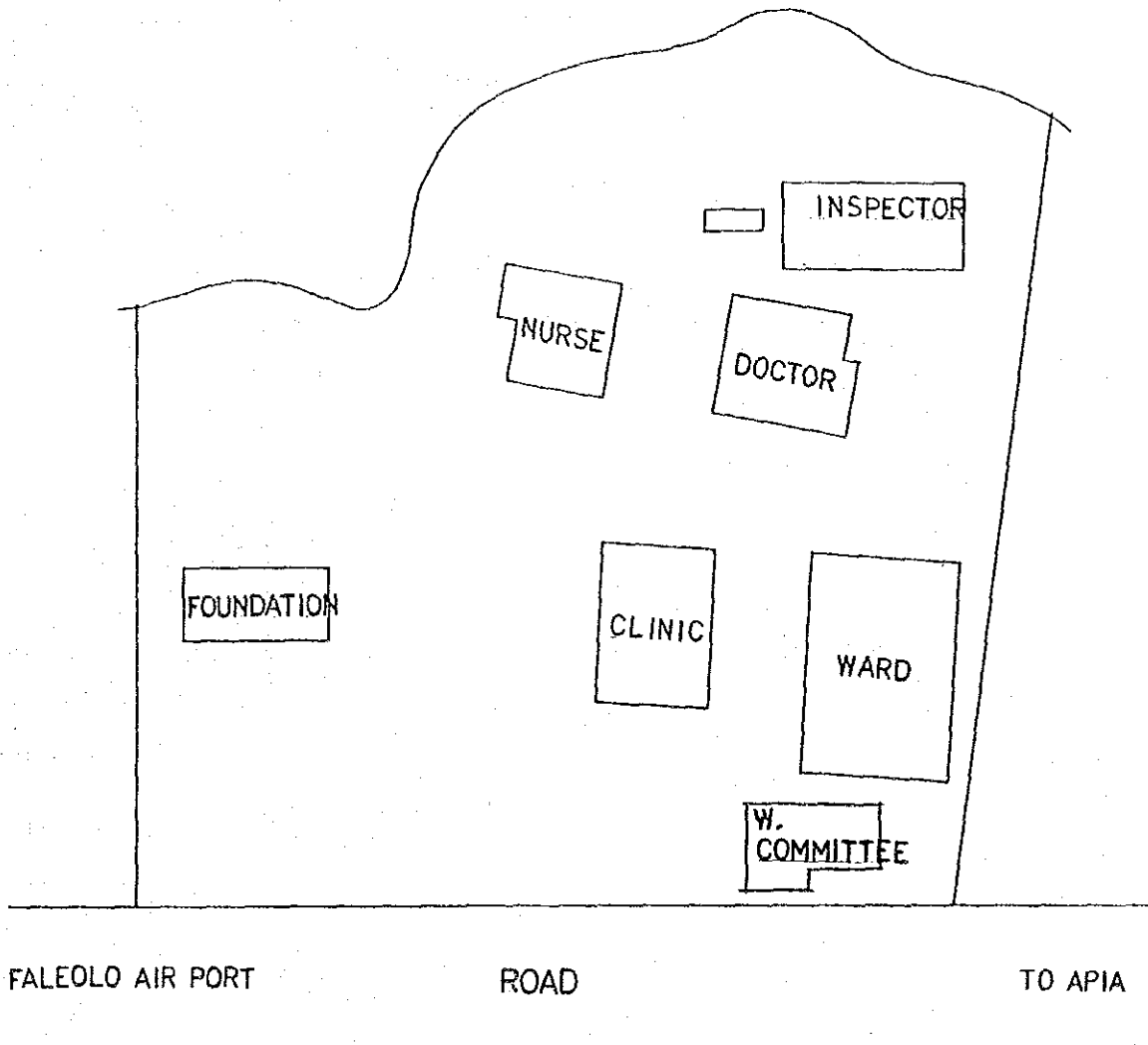


FIG. 3-2-2
LEULUMOEGA
EXISTING SITE PLAN

1/600



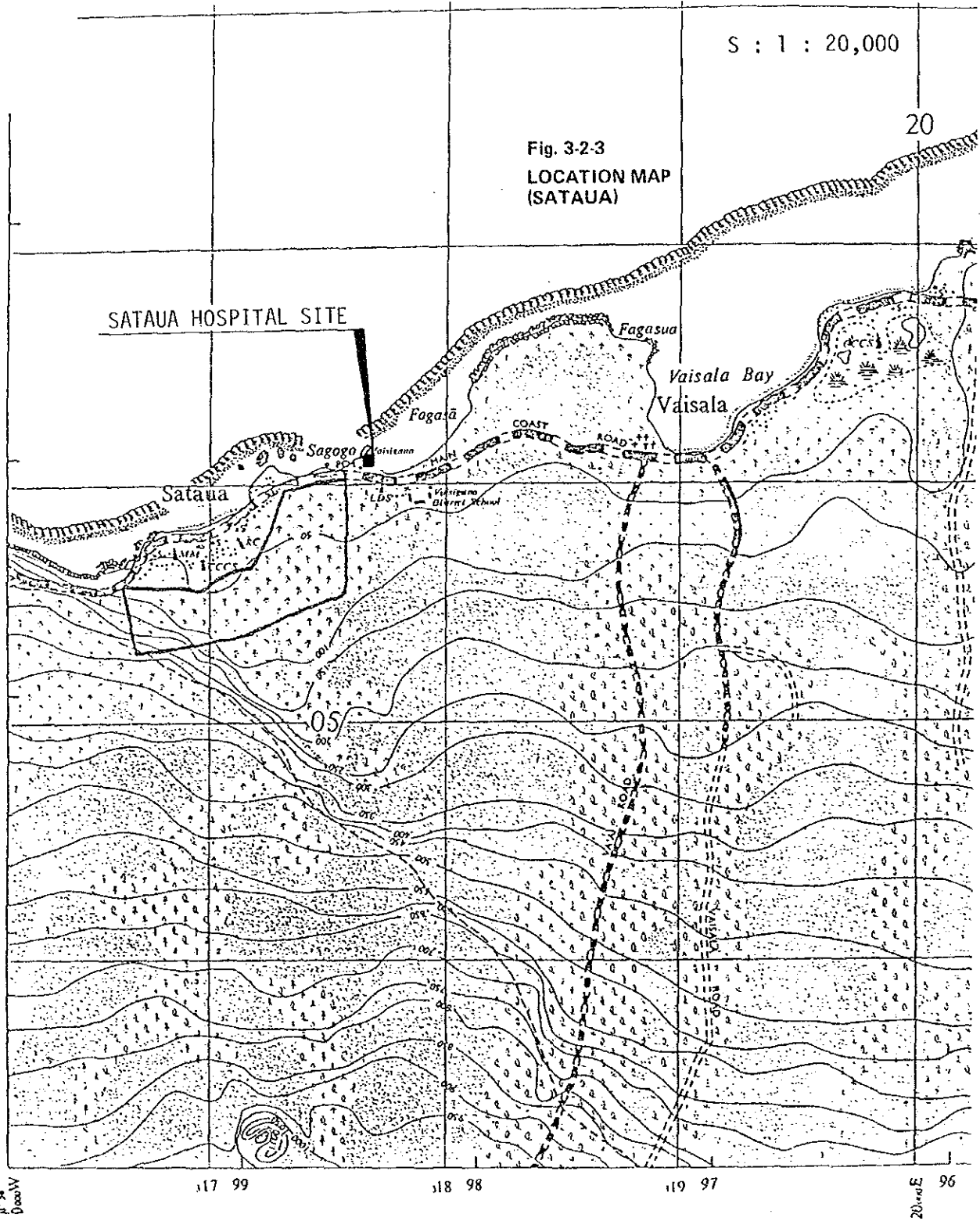


Fig. 3-2-3
LOCATION MAP
(SATAUA)

SATAUA HOSPITAL SITE

S : 1 : 20,000

20

17 99

18 98

19 97

20 96

W
000W

20
S

PACIFIC OCEAN

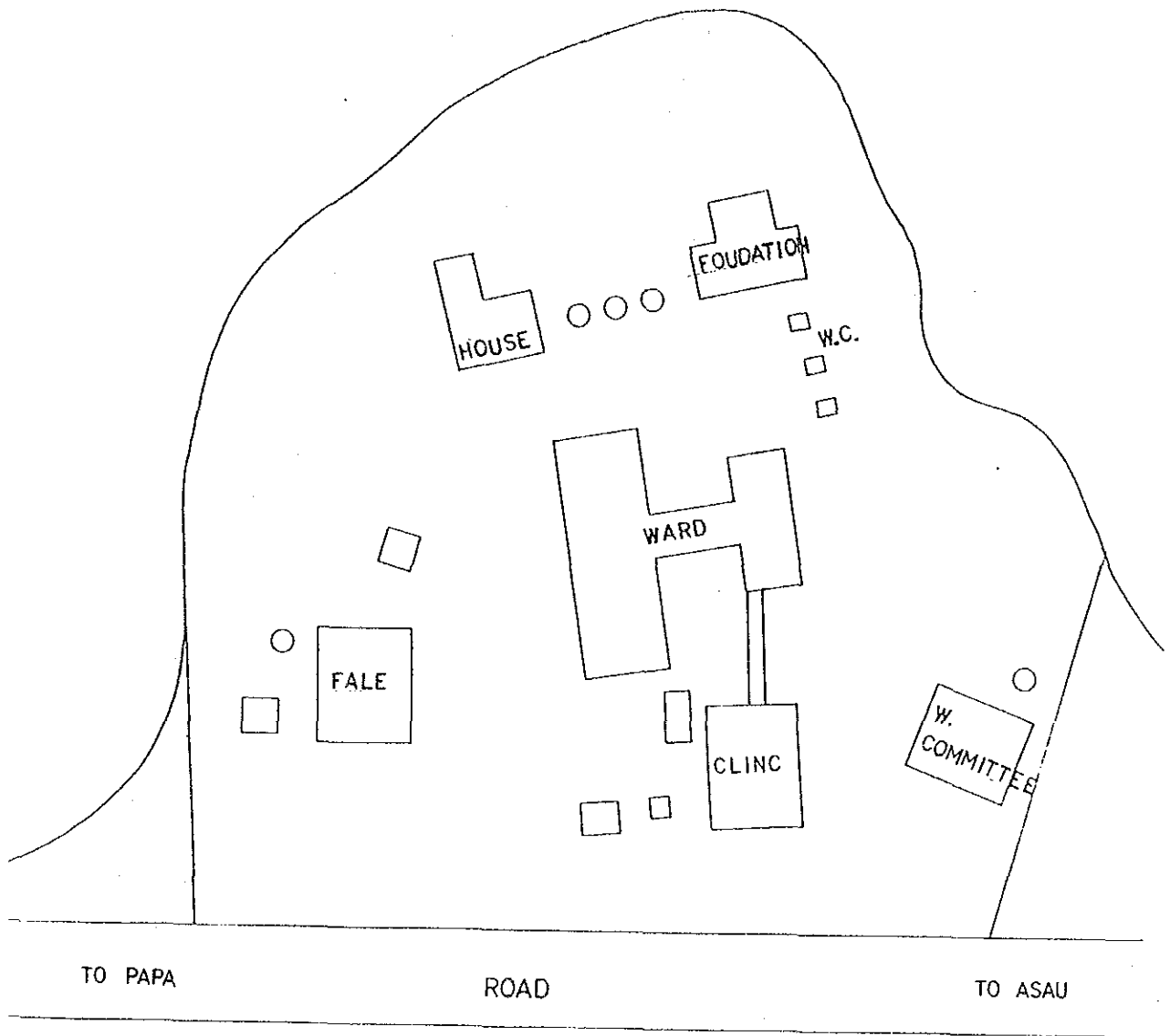


FIG. 3-2-4

SATAUA

EXISTING SITE PLAN

1/600



3.2.3. Infrastructures near the Sites

(1) City Water

City water is installed and managed by the Water Section of PWD (Public Work Department).

Both in Leulumoega Hospital and in Sataua Hospital, a city water main is installed at the mountain side of the road. Water source is deep wells and the raw water is supplied without any water treatment in both districts. Although the water does not taste bad nor smell, the water in Sataua district tastes a little bit salty as deep wells are bored below sea level. In Sataua district, the waterwork is being upgraded with Australian aid.

In Leulumoega, the material of the water main pipe is asbest-cement and its water pressure is 6 kgf/cm^2 at no flow period, and in Sataua, material is PVC (polyvinyl chloride) and the water pressure is also 6 kgf/cm^2 . Buried depth is quite shallow and exposed pipes can be seen at some places.

Water supply interruption which lasts for one to two days normally may occur in the case of electricity failure and breakdown of waterworks.

(2) Electricity

Public electricity networks are installed and managed by EPC (Electrical Power Corporation).

Networks are installed on mountain side along the road both in Leulumoega and in Sataua as with the city water main. The supply voltage of high tension is 22kv (in Sataua 2.2kv at present, but 22kv in the future), and the low voltage is 3-phase, 4-wire, 415v/240v, and the frequency is 50 Hz. The fluctuation of voltage is within 5% and the fluctuation of frequency is within 1.5%. As for the electricity interruption, in Leulumoega it may occur once in about two (2) weeks lasting for one to two hours, and in Sataua at present there are interruptions often because of the extension works, but it is expected cuts will be very seldom in the future.

At Leulumoega Hospital there is a 3-phase, 50 kva transformer near the site. In Sataua district, the electric network has been installed recently. There is a new 1-phase, 75kva transformer on the pole across the road, but the electricity is not connected to the hospital yet.

(3) Locations of the City Water Main and the Electricity Networks

Fig. 3.2.3 show the locations of city water main and the electricity networks in Leulumoega and Sataua.

(4) Other Commentary

In Western Samoa, there are no public sewage system except in central Apia which treats only rainwater, and there is no city gas system.

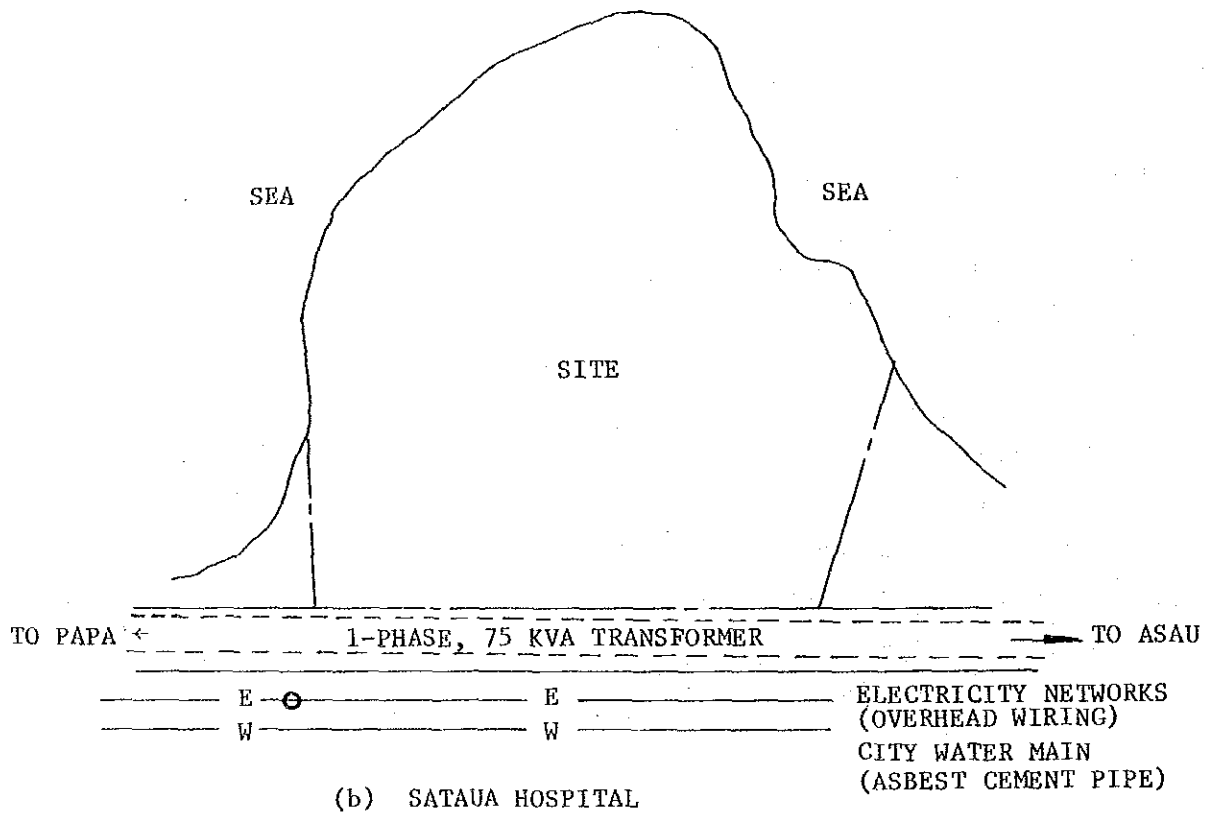
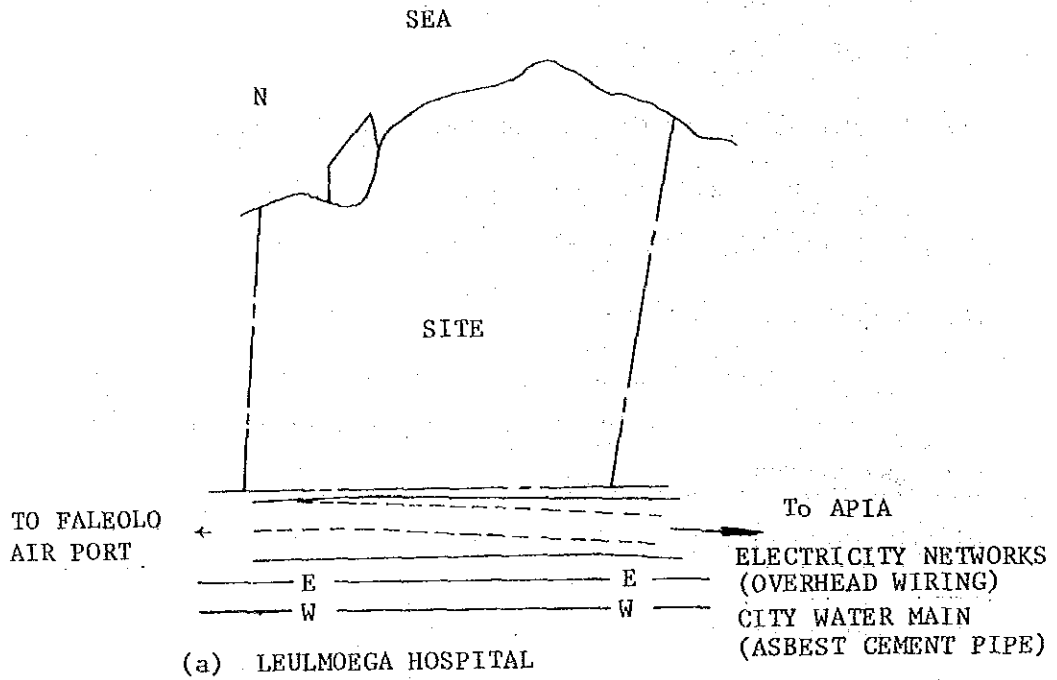


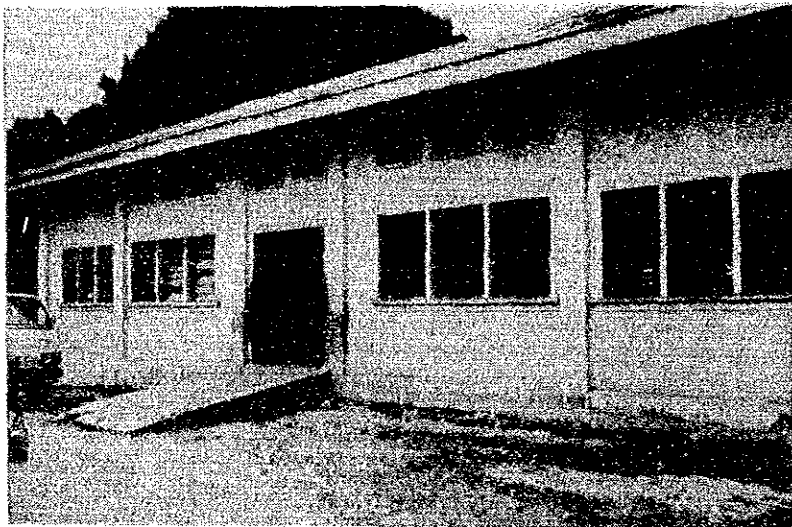
Fig. 3.2.3 CITY WATER MAIN AND ELECTRICITY NETWORKS

3.2.4 Present Conditions of Facilities

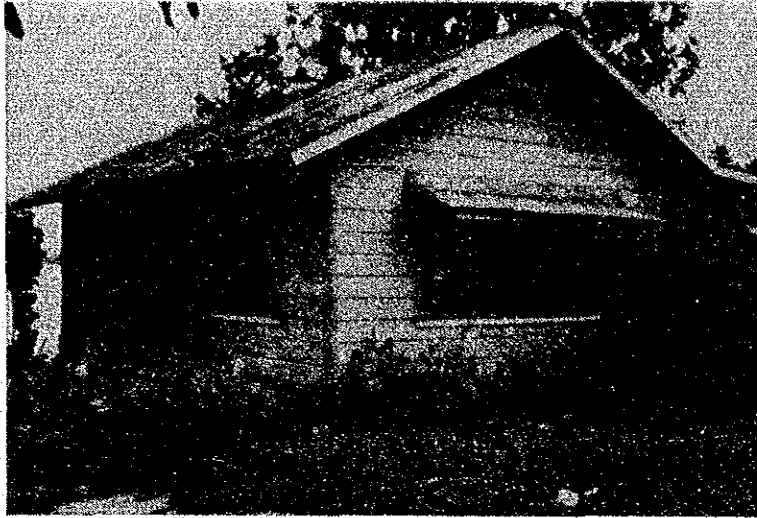
The buildings are mostly of wood and partially of concrete (a ward of Leulumoega District Hospital). The year of construction is uncertain. Judging from the information and appearances of the buildings, they should have been built in 1940s. They are superannuated noticeably. Some wooden-made buildings are badly decayed, left empty and in no use. Some portions of concrete-made buildings are also decaying. Some covering concrete has taken off and the iron bars are exposed and rusted. In fact, some of the buildings are in dangerous condition. It would not be wise to make temporary and partial alterations on the buildings.



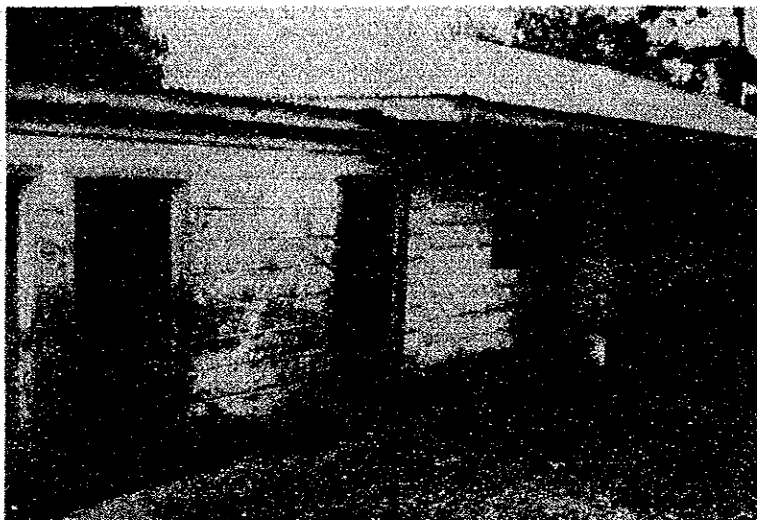
CLINIC



WARD



NURSE



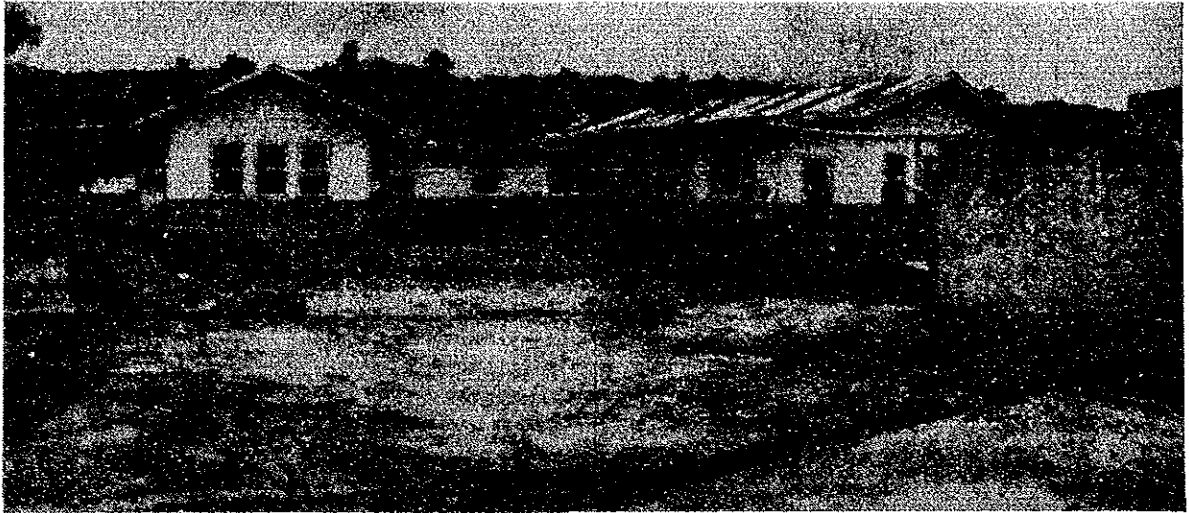
INSPECTOR

-LEULUMOEGA-

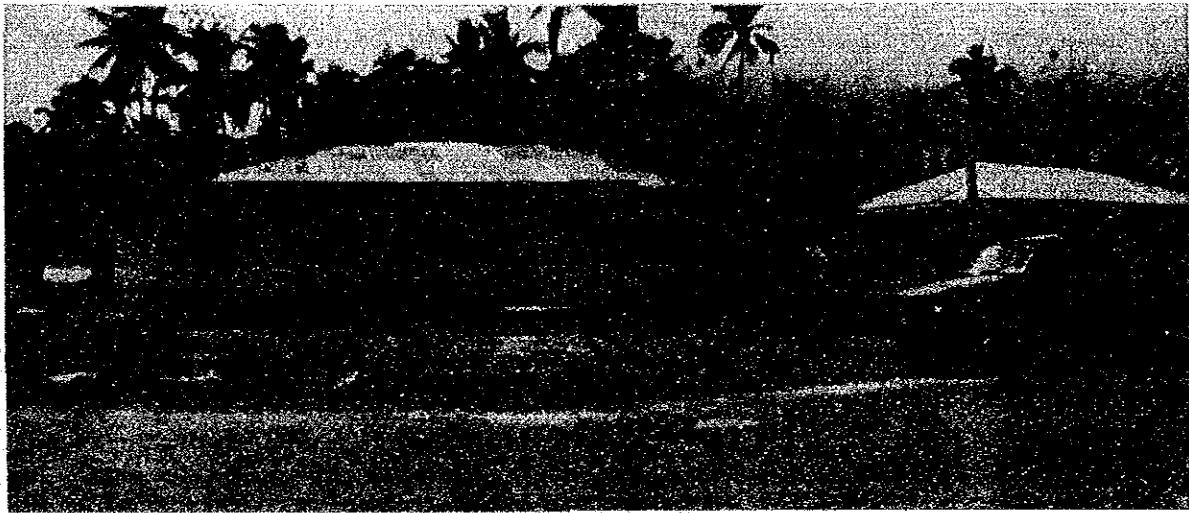


SITE

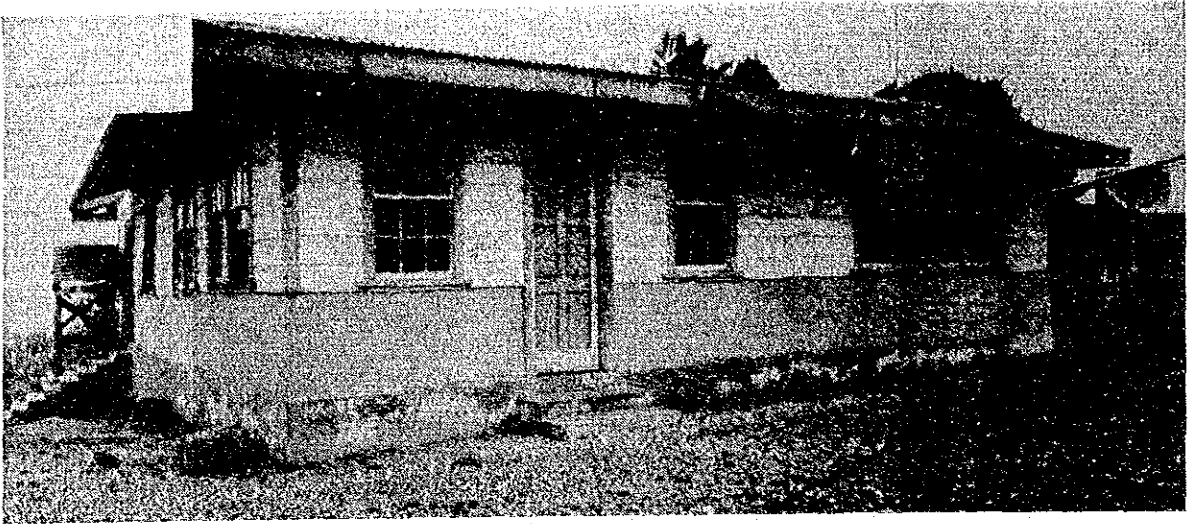
-LEULUMOEGA-



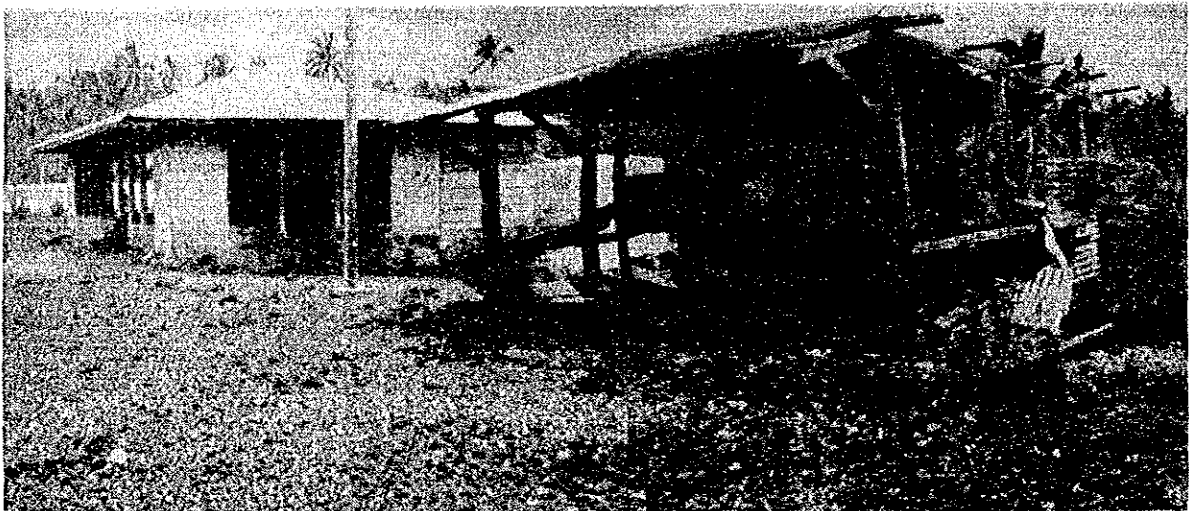
WARD



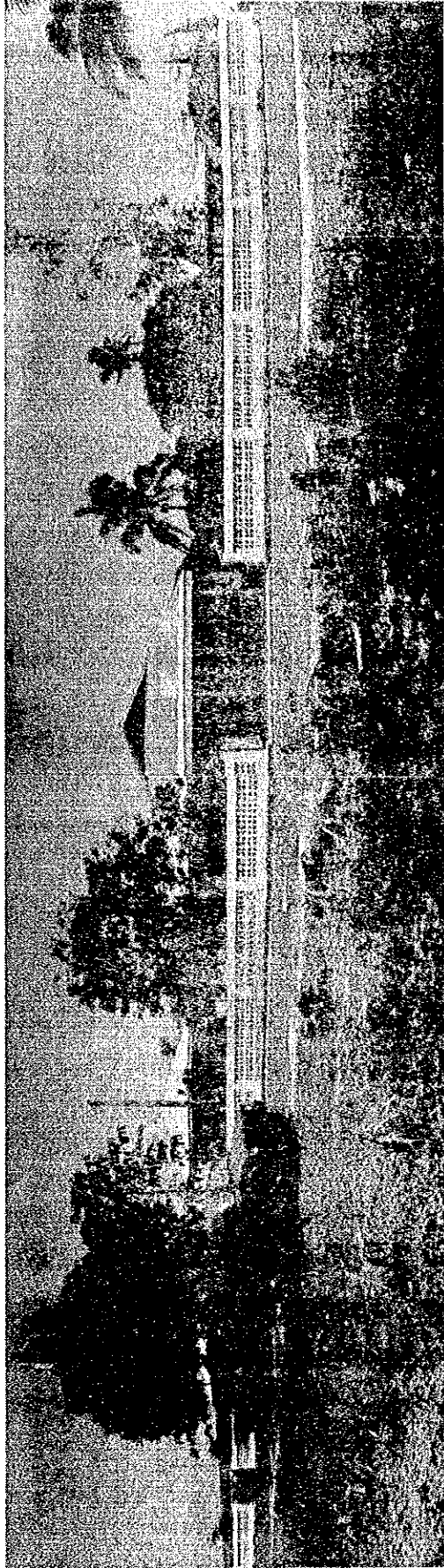
DOCTOR+NURSE



INSPECTOR



FALE + KITCHEN



CLINIC

-SATAUA-

3.2.5 Mechanical and Electrical Systems in Existing Hospitals

(1) General Descriptions

The following descriptions are about mechanical and electrical systems in existing hospitals in Leulumoega and Sataua.

Water is supplied by the city Waterworks and both hospitals have several storage tanks, galvanized corrugated tanks, which store the rainwater from the roof preparing for the interruption of city water supply. In most tanks, water supply pipes from these tanks are not installed because of their installation height, but a faucet is attached to each tank. In Leulumoega Hospital city water service pipe is connected to one of two tanks. Hot water supply system is not installed.

Drainage, waste and vent system is a New Zealand System, waste water being once discharged to gully traps and then connected to the main drainage pipes to which soil water is discharged directly.

Septic tanks are also New Zealand system which receive both waste water and soil water. A septic tank consists of a digestion chamber and the effluent from the tank is disposed through the soak field. Septic tanks and their soak fields are located separately, near the toilets, rather than centrally.

Leulumoega Hospital is supplied electricity at EPC. In Sataua district, electricity networks have just been installed but electricity is not served to the hospital. The existing electrical system including a generator is reaching a dangerous condition due to age and is no longer in use.

Kerosene is used for cooking and heating purposes.

(2) Materials

Most materials for both mechanical and electrical systems other than such native materials as wood, sands and crushed stone are imported from New Zealand or Australia. However, some such locally fabricated products as galvanized corrugated tanks and bio-burners are seen.

3.3 Demand in Medical Services

The basic Health Information on Leulumoega, Sataua and Aleipata (newly up-graded by the Western Samoan Government) District Hospitals are in the table (3.3.1).

3.3.1 Number of outpatients

The figures of population ratio and annual numbers of outpatients ratio (1982) in Leulumoega, Sataua and Aleipata are 1.7:0.9:1.0 and 1.8:1.1:1.0 respectively and almost proportional to one another.

The population of Leulumoega and Sataua in 1979 is 14,555 and 7,594 respectively. The annual increasing rate of population would be 1.4% and 5.3% respectively (According to Health Statistics for Western Samoa, 1979). Assuming that the population will increase at above rates, estimated numbers of population and outpatients for 10 years ahead since the year (1984) when the reconstructions of facilities under projects are completed, are as follows:

	Leulumoega		Sataua	
	Population	Outpatients	Population	Outpatients
1. 1979 (1982)	14,555 (15,183)	(11,866)	7,594 (8,938)	(7,308)
2. 1984	15,603	12,195	9,834	8,042
3. 1989	16,724	13,071	12,728	10,408
4. 1994	18,179	14,209	16,479	13,475

In 1994, the average numbers of outpatients per day would be about 46.8 in Leulumoega and 44.9 in Sataua.

3.3.2 Necessary Hospital Beds

The figures of (beds x bed occupancy rate) are 2.988:4.32:4.20= 0.71:1.03:1.00 in three Hospitals. According to these figures, those of Sataua and Aleipata are in proportion to each other, that is, the population and numbers of outpatients are proportional in the two districts. However, the figure of Leulumoega, which is both 1.7 - 1.8 times larger than the other districts, is relatively low: 71%. There are two reasons for this. Firstly, most of the patients in Leulumoega

District are transferred to the National Hospital which is in the vicinity of Leulumoega District Hospital. In 1979, the number of patients who were transferred to the National Hospitals were 6 from Leulumoega, and 27 from Sataua. This is due to the fact that patients in Sataua in the far distance are sent to the Sataua District Hospital first and then transferred to the National Hospital whereas those in Leulumoega are sent directly to the National Hospital. Secondly, the Leulumoega District Hospital is not in a satisfactory condition as far as medical service is concerned. In other words, the Leulumoega District Hospital would be able to offer greater medical treatment to its local patients if its facilities are sufficiently improved.

So the necessary hospital beds in each proposed hospital should be determined by multiplying each population and the inpatient ratio in Sataua Hospital.

Table 3.3.1 BASIC HEALTH INFORMATION
LEULUMOEGA AND SATAUA HOSPITAL

	Leulumoega	Sataua	Aleipata
1. TOTAL POPULATION	14,555	7,594	8,544
% to the Total population (1981)	9.2%	4.8%	5.4%
Population under 1 year (3%)	437	228	256
Population under 5 years (13%)	1,892	987	1,110
Population under 15 years (42.2%)	6,142	3,205	3,606
Female population (15 - 44) (20%)	2,911	1,519	1,708
Population 65 years and over (4.5%)	655	342	884
2. HOSPITAL DATA			
Number of hospital beds	12	24	30
Number of Outpatient (1982)	11,866	7,309	6,417
Number of Inpatient (discharge)	251	453	289
Number of Delivery (1982)	12	29	29
% Bed Occupancy	24.9%	18.0%	14%
Average length of stay	4.3	4.5	4.2
3. VITAL STATISTICS			
(a) CRUDE BIRTH RATE (Estimated)	37.4 per 1000 pop.	35 per 1000 pop.	35 per 1000 pop.
(b) CRUDE DEATH RATE (Estimated)	7 per 1000 pop.	7 per 1000 pop.	7 per 1000 pop.
(c) INFANT MORTALITY RATE (Estimated)	35	35	35
4. SUBCENTRES	1	1	3
5. STAFF			
- Doctor	1	1	1
- Hospital Nurses	4	3	3
- D/Nurses	3	2	3

3.4 District Hospital Reconstruction Project

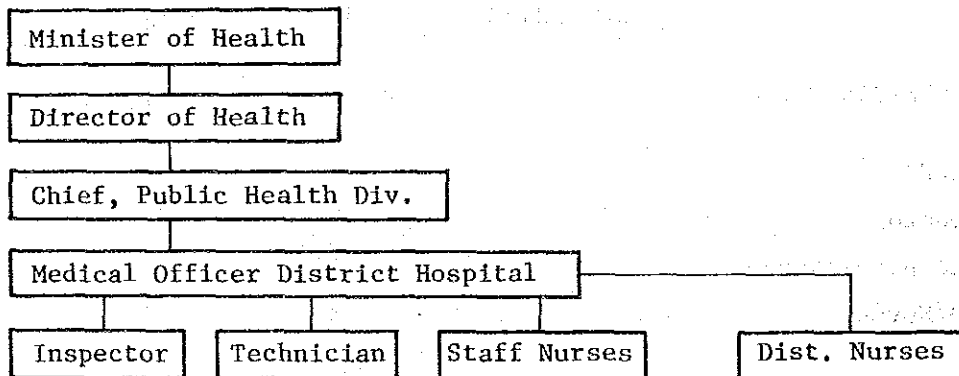
3.4.1 Objective

With improving the facilities of both Leulumoega and Sataua District Hospitals, it is expected to offer sufficient medical services in both districts, and to reduce the numbers of patients transferred to the National Hospital, thus reducing the burdens of both the patients and the National Hospital. Specific purposes are as follows:

- (1) to make the medical services much more effective by means of reconstruction of old buildings
- (2) to increase the capacity and capability of District Hospitals by means of installation of fundamental and basic medical equipment
- (3) to provide more sufficient medical services at district levels by means of preparing offices for local medical staff
- (4) to train more medical staff by means of preparing educational space.

3.4.2 Organization

The Department of Health, Public Health Division is responsible for this project. The following organizations are involved.



3.4.3 Services

The District Hospitals will offer the following services when the Project is completed.

(1) Activities for Medical Treatment

For a certain period of time, the Hospitals will be operated by a medical officer, several nurses and a few technicians. The services rendered should be limited to easy ones but include Internal Med., Pediatric, Surgery & ENT and Obstetrics and Gynecology. And dentists are also expected to visit the Hospitals for consultation.

The surgery & ENT is limited to minor operations and obstetrics & gynecology to normal deliveries. Serious cases are to be transferred to the National Hospital for further treatment.

In Western Samoa, patients are normally attended by their families who prepare meals, wash their cloths and take care of their daily life. In this way, the District Hospitals can be operated by relatively smaller number of staff.

The medical examinations are usually made in the daytime, but their hours are not specifically regulated. Very often, the Hospitals receive patients at night and are, thus, practically open for 24 hours a day.

Therefore, it is necessary to provide the doctors, nurses and attendants of patients with waiting and rest rooms.

(2) Nurse training

In Western Samoa, a nurse is trained for three years: 30% of the training goes for theory and 70% for actual training in the Hospitals. This Project aims to construct facilities for the training, with a view to training three probationer nurses in a training term.

(3) Preventive medicine

Preventive medicine is one of the most important tasks of the District Hospitals. District nurses are responsible for it under the supervision of the Medical Officers. The District nurses participate in various hygienic and preventive medical

activities by themselves as well as in advising the Health Aids in villages. The Project aims to construct offices and meeting rooms in the District Hospitals.

3.4.4 General Description

(1) Scale

The scale of the Hospitals in the Project is as follows:

a) Leulumoega District Hospital

Number of hospital beds: 23 beds

The total floor area: 1135.45m²

b) Sataua District Hospital

Number of hospital beds: 23 beds

The total floor area: 1227.63m²

Reference: The scale of Aleipata District Hospital

Number of hospital beds: 30 beds

The total floor area: 1117m²

Additional floor areas of 120m² for doctor's rooms and 370m² for Ward are proposed.

Figure 3.4.1 shows the number of beds and total floor area of ten hospitals in Japan. The positions of the proposed hospitals are also indicated in it.

(2) Facilities

It is planned to allot the Hospital area as discussed hereunder considering each function.

a) Clinic block

With examination room, dressing room, operation theater, delivery room, reception, pharmacy and dental room, inspector's room and District Nurses' room.

b) Ward

With sickrooms, nurse station, lavatories and showers.

c) Doctors' room (Inspector's rooms) unit

With a rest room for a doctor and technicians, meeting room and library.

d) Nurse training section

With nurses' room, lecture room, and library.

e) Attendants' room (Fale)

This would be a large room for attendants.

f) Kitchen and laundry

The floor areas are shown in Fig. 3.4.4 Examples of Aleipata District Hospital are also listed.

Fig. 3.4.1 Number of Beds and Total Floor Area
of Ten Small Hospitals in Japan

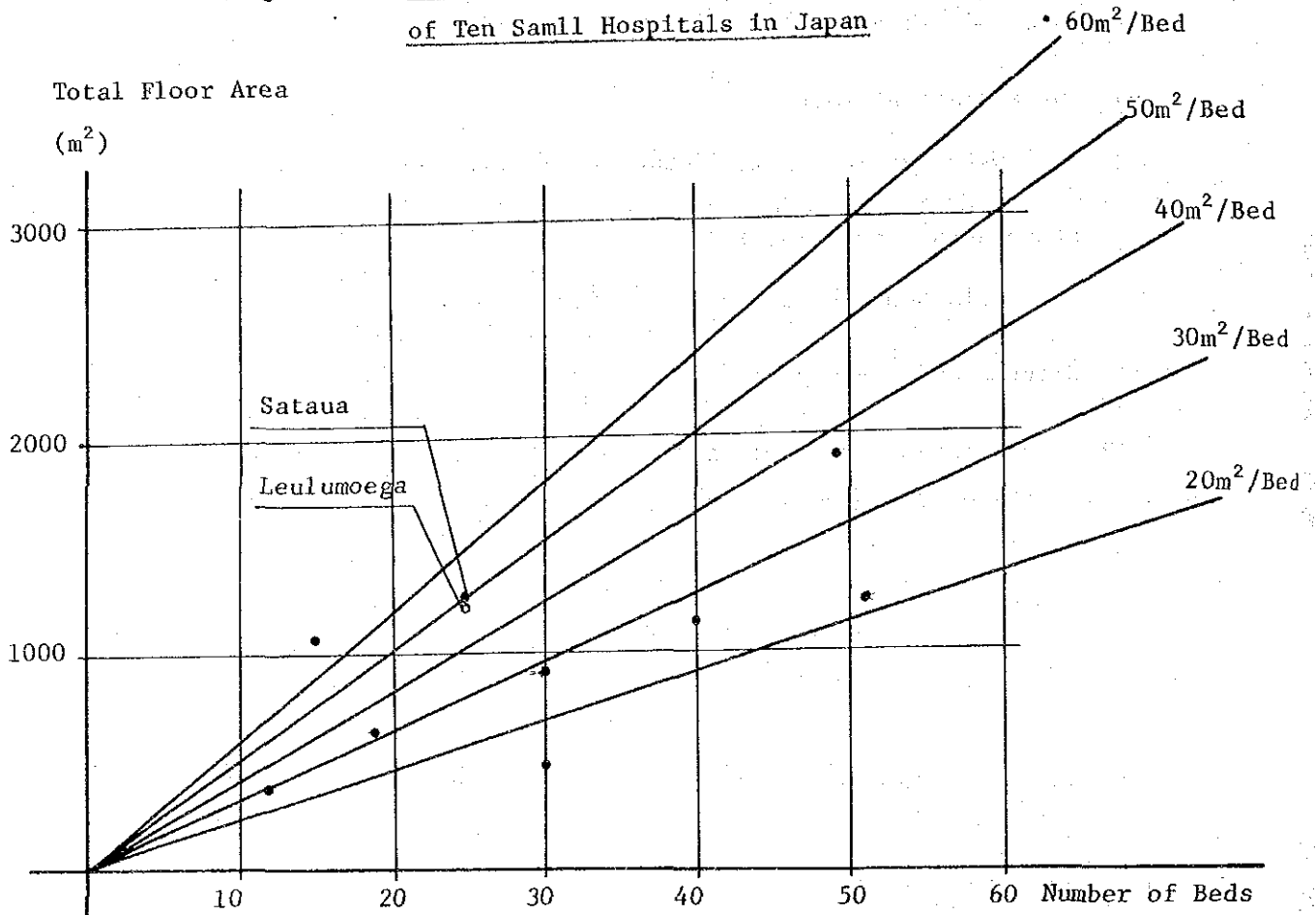


Table 3.4.4 FLOOR DISTRIBUTION OF PRESENT AND PROPOSED HOSPITALS

	Present Leulumoega Hospital	Present Sataua Hospital	Aleipata Hospital	Proposed Leulumoega Hospital	Proposed Sataua Hospital
Clinic Block	130 m ²	130 m ²	340 m ²	368.64 m ²	368.64 m ²
Ward	*1 216 m ²	200 m ²	*1 370 m ²	368.64 m ²	368.64 m ²
Doctor's Rest Room Unit	113 m ²	87 m ²	120 m ²	92.16 m ²	92.16 m ²
Inspector's "	*2 93 m ²	*1 100 m ²	*2	*1	*1
X-ray Engineer's "					*1 92.16 m ²
Nurses Training Unit	*1 77 m ²	130 m ²	152 m ²	*1 184.32 m ²	184.32 m ²
Patients' Relatives' Fale		40 m ²	60 m ²	40.96 m ²	40.96 m ²
Kitchen Laundry	(22 m ²)		35 m ²	40.96 m ²	49.96 m ²
Others		20 m ²	*3 40 m ²	*2 39.79 m ²	*2 39.79 m ²
Total	629 m ²	707 m ²	1117 m ²	1135.47 m ²	1227.63 m ²
Remarks	*1 Including Relatives' rest room *2 kitchen and laundry	*2 Roofed connecting Passageway	*1 First stage *2 Proposed same size as Doctors' *3 Roofed connecting Passageway	*1 Including Inspectors' rest room *2 Roofed connecting Passageway	*1 Including Inspectors' rest room *2 Roofed connecting Passageway

(3) Medical Equipment plan

Medical Equipment requiring less maintenance is preferable and should be selected in consideration of the status quo and medical standards of the country. Therefore, most of the Equipment with some minor exceptions like an X-ray unit, should be hand operated models in order to reduce energy consumption. Instruments like sterilizers which consume a great deal of energy, should employ hot water preheated by solar collectors.

Laboratory and operation rooms which need cleaner water of excellent quality should be supplied through a softwater producing device. It is decided to provide an ambulance for emergency measures and a Land cruiser for visiting services in distant places.

The equipment to be provided is as follows:

a) Ward

Equipment for fundamental care only. Beds installed are normal beds with the exception of manual crank-beds for I.O.U.

b) Examination rooms

Fundamental and basic equipment.

c) Dressing rooms

Equipment for minor treatment.

d) Operation rooms

Equipment for minor operations and emergency treatment which need cleaner conditions.

e) X-ray rooms

X-ray apparatus for simple X-ray photographs.