

MINISTRY OF HEALTH
THE DEMOCRATIC SOCIALIST
REPUBLIC OF SRI LANKA

NO. 1

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
MEDICAL EQUIPMENT
IN
GENERAL HOSPITAL MATARA
IN
THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA**

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MARCH 2001

**JAPAN INTERNATIONAL COOPERATION AGENCY
EARL CONSULTANTS INCORPORATED**

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PREFACE

In response to a request from the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Medical Equipment in General Hospital Matara and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Sri Lanka a study team from September 4 to October 3, 2000.

The team held discussions with the officials concerned of the Government of Sri Lanka, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Sri Lanka in order to discuss a draft basic design, and as this result, the present report was finalized.

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

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

March, 2001



Kunihiko SAITO

President

Japan International Cooperation Agency

March, 2001

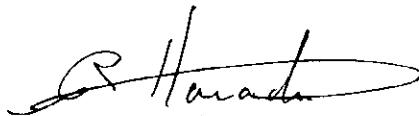
LETTER OF TRANSMITTAL

We are pleased to submit to you the basic design study report on the Project for Improvement of Medical Equipment in General Hospital Matara in the Democratic Socialist Republic of Sri Lanka.

This study was conducted by Earl Consultants Incorporated, under a contract to JICA, during the period from August 28, 2000 to March 30, 2001. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Sri Lanka and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

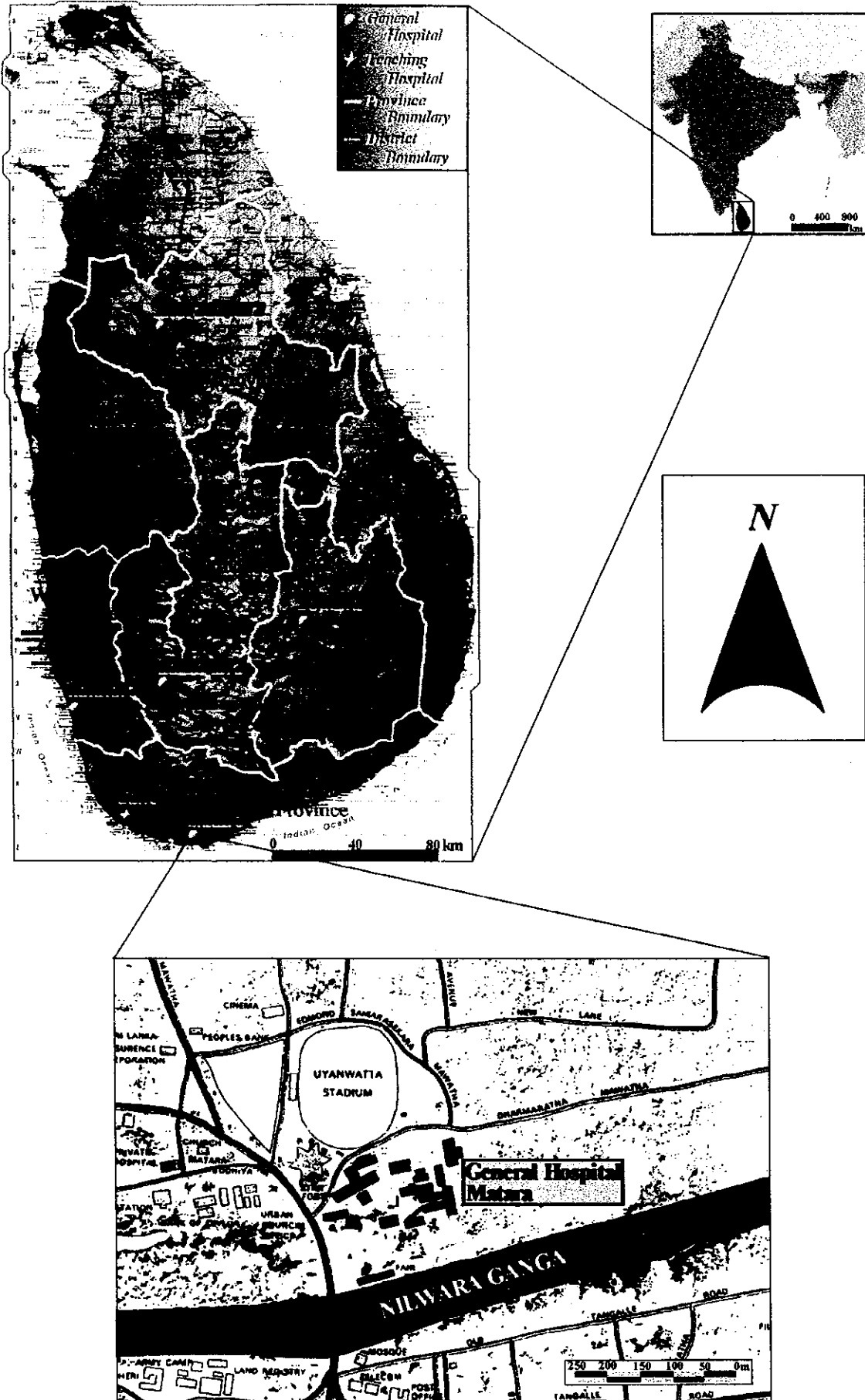
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Ryoji Harada
Project manager,
Basic design study team on
the Project for Improvement of Medical
Equipment in General Hospital Matara
Earl Consultants Incorporated

Location Map



Abbreviations

A/P	Authorization to pay
B/A	Banking Arrangement
BES	Biomedical Engineering Services Division
BHN	Basic Human Needs
CCU	Coronary Care Unit
E/N	Exchange of Notes
ETU	Emergency Treatment Unit
ICU	Intensive Care Unit
PBU	Premature Baby Unit
WHO	World Health Organization

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Letter of Transmittal

Location Map

Abbreviations

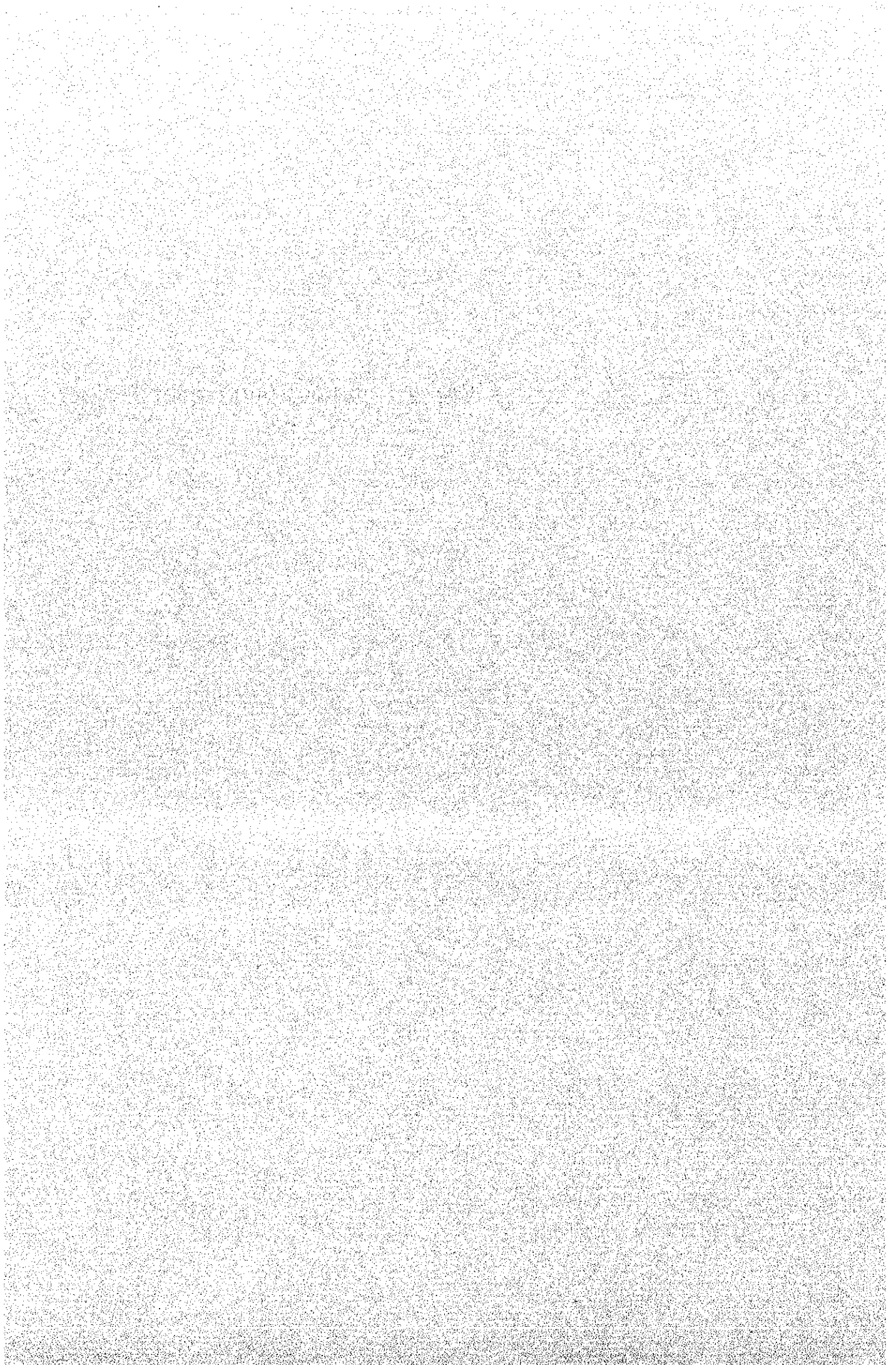
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Chapter 1 Background of the Project



Chapter 1 Background of the Project

1-1 Circumstances Leading to the Request

Each successive government of the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "Sri Lanka") has carried out policies prioritizing social welfare such as education and medical service since its independence. Now, medical care is provided free of charge to every person in Sri Lanka, and Sri Lanka's health and medical indices are better than those of neighboring countries (for example, the infant mortality of Sri Lanka is 17 per 1,000 live births, which is lower than 69 per 1,000 for India and 95 per 1,000 for Pakistan in 1998). This is a good result of the government's policies that place a high priority on the promotion of health and medical care. However, there are large regional differences in the provision of health care. This problem was addressed in the "Six Year Health Care Development Program", which started with a slogan of "Health for All People" in 1999 to rectify the regional differences in the provision of health care.

If the regional infant mortality rates are compared, then it is clear that the rates in the following regions are higher than the national average of 17 per 1,000: Anuradhapura with a rate of 28 per 1,000 (this District is near the northern region where there is Sinhalese-Tamil conflict.), Kandy with a rate of 24 per 1,000 (Kandy is former capital, so the condition of medical facilities is relatively good.), Ratnapura with a rate of 23.7 per 1,000 (the Project for Improvement of General Hospital, Ratnapura was implemented in 1999.) and Matara with a rate of 21 per 1,000.

General Hospital, Matara (hereinafter referred to as "GHM") (with 899 hospital beds, receiving about 68 thousand inpatients a year and about a thousand outpatients a day), which is to be improved by this Project, provides medical care to the people who live in Matara District located in the southern region of the country and Hambantota District which borders on Matara District (a total population of about 1.3 million). The hospital was raised to the status of "General Hospital", which is under direct control of the Ministry of Health (hereinafter referred to as "MOH"), from "Base Hospital", which is under the Ministry of Health of a provincial government in 1994. Though the status of the hospital is elevated, the condition of the hospital has not been improved yet. At present, the hospital does not have a sufficient number of beds and enough space to provide appropriate care, and it also has a shortage of medical equipment. In this condition, the hospital is not able to function sufficiently as a general hospital. As a result, many patients who would have come to GHM for medical care are actually going to a teaching hospital (the status of "Teaching Hospital" is one level above that of "General Hospital", and teaching hospitals are top referral hospitals) in Galle District, a neighboring District, causing a bypass phenomenon (this phenomenon is described in the document which is presented to request assistance for this Project). A study for long term grant assistance which was conducted in 1998 confirmed this condition and described a need for improving the facilities and the medical equipment of GHM.

On this background, the Government of Sri Lanka has requested the Government of Japan assistance for a project to improve the facilities and the medical equipment. In response to this request, the Government of Japan is considering that the whole work of improving the hospital

function be shared by both the parties and that only the medical equipment of the existing facilities of the hospital be improved with a grant from the Government of Japan, and the renovation and expansion of the facilities be carried out by the Government of Sri Lanka by its own efforts. In this respect, the expansion of the obstetrics and gynecology department is now being carried out with funds from the MOH. This construction work is to be completed in March, 2001.

1-2 Outline of the Request

1) Objectives

The Government of Sri Lanka has drawn up a project to improve GHM (hereinafter referred to as "the Project") for the purpose of solving the above mentioned problems of the hospital, namely, shortages of beds, rooms and medical equipment. By solving the problems, the Government intends to promote the welfare of the people living in the region where the hospital is located.

For the implementation of the Project, the Government of Sri Lanka has requested the government of Japan a grant to fund the procurement of medical equipment carried out on the Project.

The objective of the Project is to improve the functions of GHM, so that the hospital can provide medical care to the people living in Matara District and Hambantota District in the southern region of Sri Lanka.

2) Executing Agency of the Project

The MOH is responsible for the implementation of the Project, and GHM takes charge of the actual implementation. Therefore, the budgetary allocation for the operation and maintenance of the hospital is conducted by the Ministry of Health, which exercises jurisdiction over the hospital.

3) Outline of the Request

(1) Medical facilities requested for improvement

GHM

(2) Specific facilities requested for improvement

Construction of a four-story outpatient ward (approx. 5,725 square meters)

(3) Items of medical equipment requested

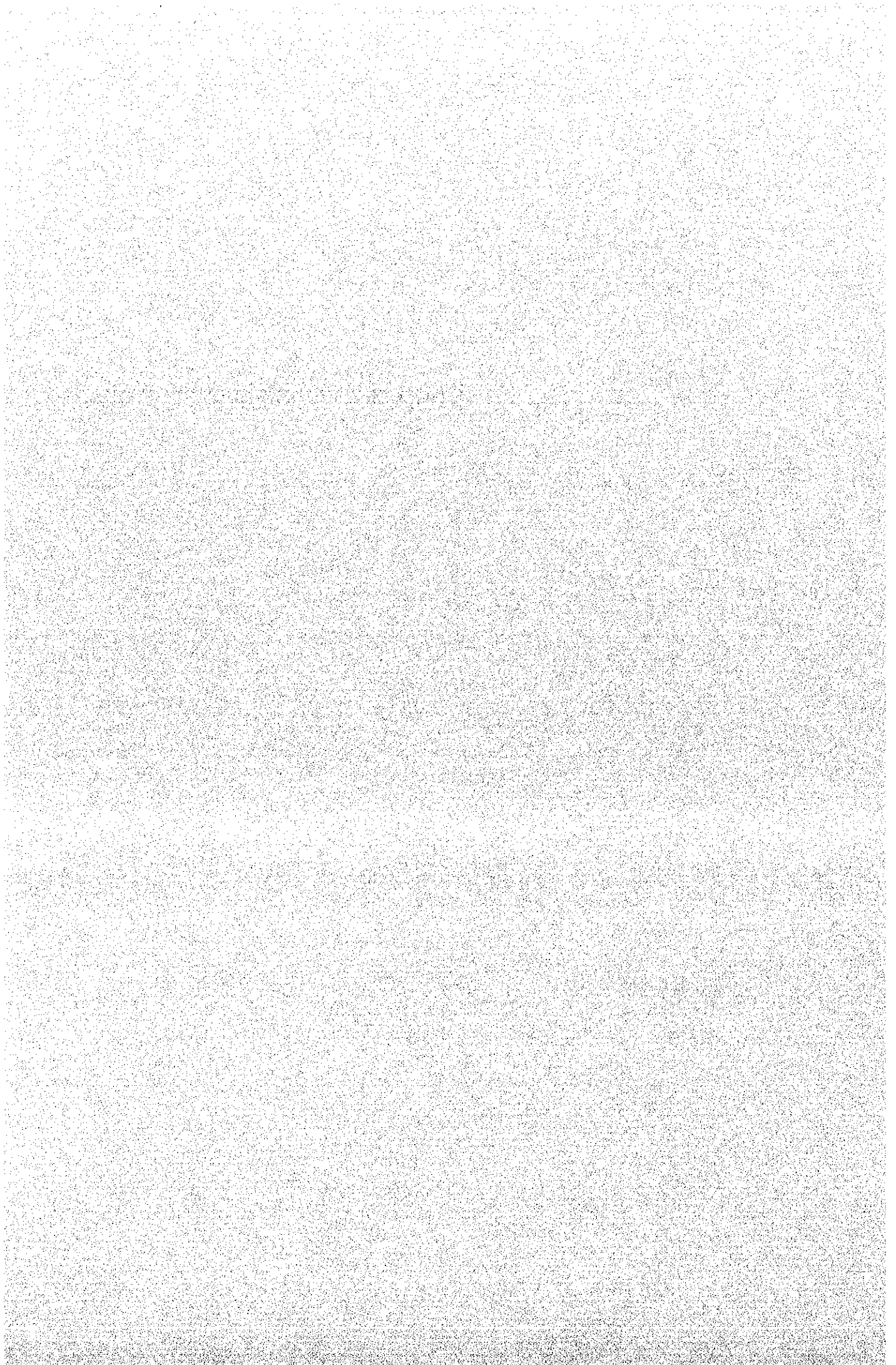
Table 1-1 shows major items of the equipment requested.

Table 1-1 Major items of equipment requested

Departments	Quantity	Major Equipment
A. Emergency Treatment Unit	18	Bedside monitor, Defibrillator, ECG machine etc.
B. Operating Unit	34	Anesthesia with ventilator, Laparoscope forceps set, Operating light etc.
C. Endoscopy Unit	14	Gastrointestinal fiberscope set, Broncho Fiberscope set, Light source etc.
D. ICU, SICU	16	Blood gas analyzer, Ventilator, Defibrillator etc.
E. CCU, ICCU	14	Ventilator for adult, Bedside monitor, Defibrillator, etc.
F. OPD Clinic	14	Audiometer, Infusion pump, Resuscitator, etc.
G. Eye unit	7	Operation microscope, Echo unit for Ophthalmology, Micro instrument set for Eye, etc.
H. Dental Clinic & Oral & Maxillo-Facial unit	11	Dental chairs with compressor, Autoclave, table top, Pulse oximeter etc.
I. Radiology section	16	General X-ray unit, Ultrasound scanner unit, Fluoroscopy, X-ray unit, etc.
J. Laboratory	22	Colony counter for Microbiology, Spectrophotometer, Chemical analyzer, etc.
K. Labor Room	14	Delivery bed, Cardiotocograph (CTG), Suction apparatus, etc.
L. Premature Baby Unit (PBU)	17	Infant Incubator, Photo-therapy unit, Infant ventilator, etc.
M. New PBU unit	13	Infant Incubator, Photo-therapy unit, Infant ventilator, etc.
N. Wards	9	Suction apparatus, Nebulizer, Patient trolley etc.

O. Sterilization Unit	8	Autoclave, large size, Autoclave, medium size, Instrument sterilizer, large size etc.
P. Health Education Unit	6	Video camera, Video deck and TV monitor, Overhead projector, Desk top computer set, etc.
Q. Maintenance Unit	3	Electric maintenance equipment, Mechanic maintenance equipment, Maintenance tool set, etc.
R. Others	7	Washing machine, Drying machine, Incinerator, Ambulances, etc.
TOTAL	243	

Chapter 2 Content of the Project



Chapter 2 Contents of the Project

2-1 Objectives of the Project

The MOH of the Government of Sri Lanka has stated the need for medical facilities to meet demand for secondary and tertiary medical care, which demand is rapidly increasing in provinces. For this reason, the MOH has made improvement of the medical facilities as a matter of the highest priority. As specific measures, rural hospitals have been refurbished to provide better services, and personnel development has been promoted by improving medical colleges and nursing schools. However, it is said that the medical facilities in the southern part of the country are still in poor condition and are in short of specialist doctors.

General Hospital, Matara, which is located in the southern province, is a clear example. It does not have a sufficient number of beds and enough space to provide appropriate care to patients who are coming there in a great number. As a result, many patients who would have come to GHM for medical care are actually going to a teaching hospital in Galle district, a neighboring district, causing a bypass phenomenon. To solve this problem, the MOH has devised a project to improve GHM with an objective to improve the quality of medical care for the people who live in Matara district and Hambantota district in the southern province (this project is herein referred to as "Project"). To materialize this Project, the Government of Sri Lanka has made a request for a grant to the Government of Japan so as to secure funds necessary for building facilities and procuring medical equipment. After receiving this request, the Government of Japan has shown and explained intention to assist only the medical equipment procurement part of the Project, and both the governments have agreed on this limited assistance.

The objective of the Project is to improve the quality of medical care for the people living in the targeted area by raising the level of the basic function of GHM. More, specifically, the functions of medical examination and treatment provided by the hospital are improved by eliminating the present shortage of medical equipment. Also, the function of the hospital to train hospital staffers is strengthened, and hygienic education provided by the hospital to the people in the districts is reinforced. In a short term period, the Project is effective to solve the above mentioned bypass phenomenon, so the number of patients who will visit the hospital is expected to rise. In a middle and long term period, it is expected that the Project will contribute to the reorganization of the referral system in the area.

2-2 Basic Concept of the Project

2-2-1 Assistance Policies

The functions of the hospital, which is to be improved on this Project, are to provide secondary and tertiary medical care to the people living in Matara district and Hambantota

district. In addition, the hospital, which is one of the five general hospitals of Sri Lanka, is to accept patients who are referred from lower level hospitals such as base hospitals and provincial hospitals in the province and to refer patients to upper level hospitals such as Teaching Hospital, Karapitiya in Galle and General Hospital, Colombo.

However, at present, the hospital cannot provide these functions fully because it faces problems like a shortage of medical equipment. The following is an outline of such problems. Most of the existing medical equipment is old and in dilapidation. Also, there are not many items of equipment, and the quantities of the existing items are relatively small. In this condition, the hospital is not effective in providing medical services. As a reference, a list of the items of the existing equipment is attached at the end of this report.

In addition to the shortage of medical equipment, the hospital has a limited amount of floor space, so it is difficult for the hospital to provide, in a satisfying manner, secondary and tertiary medical care to the people in the area.

For the Project, the Government of Japan provides funds for the procurement of medical equipment, and the Government of Sri Lanka provides funds for executing the remaining part of the Project, namely for construction and repair of facilities and management of the Project. The Sri Lanka party intends to solve the above mentioned problems and thereby improve the quality of medical service.

On this background, the assistance policy for the Project is determined as follows. As the Project is to improve the function of the target hospital for providing medical care, the assistance should be directed mainly to the medical equipment improvement of the existing medical departments and to the procurement of equipment for the newly built maternity block of the hospital. Therefore, the facilities of the hospital to be furnished on the Project are:

- 1) the existing facilities,
- 2) the new maternity block, and
- 3) the new laundry block.

However, the assistance should also help improve the educational function, so that the hospital can better inform the people living in the province of public hygiene and health care for mothers and children and train hospital staffers to better perform hospital services. Therefore, the equipment to be procured on the Project should be determined in consideration of the current condition where such education and training are provided.

2-2-2 Determination of the Equipment to be Procured

When the study team visited the hospital, it held a meeting with the people in charge of the departments of the hospital to confirm the contents of the request and studied the facilities and equipment as well as the maintenance system of the hospital.

Then, the study team has made up an equipment list which is attached to the minutes of

the meeting. This list includes the priority order determined as follows. Each item of the equipment listed is further examined in the talks with the people in charge of the departments and the persons concerned with the Project.

[Order of the procurement on the Project]

The first priority is given to those items which are recognized by the Sri Lanka party and the Japanese party as essential for providing medical care.

The second priority is given to those which are recognized by both the parties as necessary for providing medical care and are determined in an analysis conducted by the study team in Japan as appropriate for procurement on the Project.

The third priority is given to those which are determined by both the parties as low in appropriateness for procurement on the Project.

After the above order of priority was agreed by the Sri Lanka party and the study team, the items of equipment requested have been further examined on their necessity and appropriateness in accordance with this order of priority in an analysis conducted by the study team in Japan. In this examination process, each item is judged in comparison with equipment selection criteria which are described below to reach a total judgment for deciding whether or not the respective item should be procured on the Project and, if it should, then how many units are appropriate. Specifically, for each item, at first, the criteria satisfied are marked with "○", and then, if all the criteria are satisfied, then this specific item is marked with "○" in the totality judgment section of the list, i.e., Table 2-1 "Equipment Determination." However, if all the criteria are not satisfied, then the item is marked with "×".

[Rules for selecting items of equipment for the procurement on the Project]

- 1) Priority for the procurement is placed in the following order:
 - (1) items of medical equipment which are essential for performing basic examinations and treatments;
 - (2) items to replace the existing old items of medical equipment;
 - (3) items that are supplementation to the existing equipment to alleviate the present shortage;
 - (4) items which can be operated and maintained by the hospital staff easily;
 - (5) items that are sufficiently maintainable by the Sri Lanka party; and
 - (6) items which are necessary for the hospital to play its role in the referral system and to meet local needs.
- 2) Some items are excluded from the procurement because:
 - (1) the hospital does not have staff members who are capable of operating them;
 - (2) necessary spare parts and consumables are difficult to purchase their functions are the same as other items which are planned to be procured;
 - (3) necessary spare parts and consumables are difficult to purchase locally;
 - (4) they cannot be operated effectively by the staffers of the hospital at the current technical

level;

(5) they have very limited effectiveness; and

(6) they are in working order, enough in number at the moment and are more than necessary.

3) Equipment to delete or decrease in number

The quantities of some items are reduced because the originally requested quantities are considered more than necessary.

[Note: Definition of OUT OF ORDER; the hospital staff members are managing to use some items of obsolete equipment. But they often fall in not-working condition, or some of their functions are not working or none of functions are working, or not working. Such items are defined as out-of-order equipment.]

13	Operating table	0																		2	B					2	2	
14	Shadowless lamp	0																			2	B					2	2
C. Endoscopy Unit		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final				
		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty					
1	Gastrointestinal fiberscope	1		1	○	○	○	○	○								1	B	1									1
2	Duodeno fiberscope set	0			○	○	○	○	○	○							1	B										0
3	Colono fiberscope set	1		1	○	○	○	○	○							1	B	1										1
4	Sigmoid fiberscope set	0			○	○	○	○	○						○	1	B											0
5	Video monitor set	0			○	○	○	○	○							1	B							1				1
6	Light sources for	1		1	○	○	○	○	○							1	B	1										1
7	Disinfections container	1		1	○	○	○	○	○						○	2	B	1										1
8	Fiberscope cabinet	0			○	○	○	○	○							1	B							1				1
9	Broncho fiberscope set	1		1	○	○	○	○	○							1	B	1										1
10	Light source for Broncho	0			○	○	○	○	○		○					1	B											0
11	Endoscopic suction pump	0			○	○	○	○	○							1	B								1			1
12	Disinfection container	0			○	○	○	○	○		○					1	B											0
13	Endoscopy procedure cart	0			○	○	○	○	○							1	B											1
14	Leakage tester	0			○	○	○	○	○							1	B											1
D. ICU, SICU		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final				
		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty					
1	ICU bed	4		4	○	○	○	○	○						○	5	B	4										4
2	Ventilator for ICU	3	2	1	○	○	○	○	○						○	5	B	1	1									2
3	Potable ventilator	0			○	○	○	○	○							1	A							1				1
4	Pulse oximeter	3	1	2	○	○	○	○	○						○	2	B	1										1
5	Defibrillator	2		2	○	○	○	○	○							1	A	1										1
6	ECG monitor	3	1	2	○	○	○	○	○						○	5	B	2										2
7	Blood gas analyzer	0			○	○	○	○	○							1	B								1			1
8	X-ray film viewer for 2 films	0			○	○	○	○	○						○	2	B								1			1
9	Nebulizer	0			○	○	○	○	○							2	B											2
10	Instrument cabinet	2		2	○	○	○	○	○							2	B	2										2
11	Instrument cart	0			○	○	○	○	○							2	B									2		2
12	Syringe pump	0			○	○	○	○	○						○	6	B									4		4
13	Infusion pump	0			○	○	○	○	○							2	B											0
14	Oxygen flow meter	4		4	○	○	○	○	○						○	5	B	4										4
15	Capnometer	0			○	○	○	○	○							1	B											1
16	Autoclave, table top	0			○	○	○	○	○							1	B											1
E. CCU & ICCU		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final				
		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty					
1	Respirometer	1		1	○	○	○	○	○						○	2	B											0
2	Ventilator for adult	0			○	○	○	○	○						○	4	B									1		1
3	ECG machine	0			○	○	○	○	○						○	2	B											1
4	Suction apparatus	2		2	○	○	○	○	○						○	6	B	2	2									4
5	Sphygmomanometer	2		2	○	○	○	○	○						○	6	B	2										2
6	Nebulizer	1		1	○	○	○	○	○							4	B	1	3									4
7	Ambue bag	2		2	○	○	○	○	○							2	A	2										2
8	Bedside monitor	2		2	○	○	○	○	○							4	B	2	2									4
9	Defibrillator	1		1	○	○	○	○	○							2	B	1	1									2
10	Pulse oximeter	0			○	○	○	○	○						○	4	B											2
11	Syringe pump	1		1	○	○	○	○	○						○	6	B	1	2									3
12	Infusion pump	1		1	○	○	○	○	○							4	B											0
13	Exercise ECG	0			○	○	○	○	○							1	B											1
14	Gatch bed	4		4	○	○	○	○	○						○	6	B	4										4
F. OPD Clinic		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final				
		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty					
1	Pure Tone Audiometer	1		1	○	○	○	○	○							1	A	1										1
2	Impedance audiometer	1		1	○	○	○	○	○							1	A	1										1
3	Sphygmomanometer	16	8	8	○	○	○	○	○						○	30	B	8										8
4	Set of Ophthmo and	4	2	2	○	○	○	○	○						○	4	B	2	1									3
5	Minor surgical instrument set	1	1		○	○	○	○	○							1	B		1									1
6	Medical refrigerator	3		3	○	○	○	○	○						○	5	B	3										3
7	Diagnostic sets	0			○	○	○	○	○		○					6	B											0
8	Instrument cabinet	4	2	2	○	○	○	○	○							6	B	2	4									6
9	Instrument cart	0			○	○	○	○	○						○	6	B									3		3
10	Spot lamp	6	3	3	○	○	○	○	○						○	6	B	3	2									5
11	Suction apparatus for ENT	0			○	○	○	○	○							1	A											1
12	Fiber optic ENT scope	0			○	○	○	○	○							1	A											1
13	Head mirror set for ENT	1		1	○	○	○	○	○						○	3	B	1										1
14	ENT treatment unit	1		1	○	○	○	○	○						○	3	B	1										1
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final				

G. Eye unit		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty	
1	Operation microscope	1		1	O	O	O	O	O	O								1	A	1			1	
2	Echo unit for Ophthalmology.	1		1	O	O	O	O	O	O								1	B	1			1	
3	Visual field analyzer	0			O	O	O	O	O	O								1	A				1	
4	Slit lamp with tonometer	2		2	O	O	O	O	O	O								2	A	2			2	
5	Anesthesia with ventilator	1		1	O	O	O	O	O	O								1	B	1			1	
6	Pulse oximeter	1		1	O	O	O	O	O	O								1	B	1			1	
7	Micro instrument set for Eye	1	1		O	O	O	O	O	O								2	B		2		2	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final
H. Dental Clinic & Maxillo Facial unit		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty	
1	Dental chairs with	3		3	O	O	O	O	O	O								4	A	3			3	
2	Scalers	1	1		O	O	O	O	O	O			O					2	B				0	
3	Light cure machine	1		1	O	O	O	O	O	O								2	B	1	1		2	
4	Suction unit	2	1	1	O	O	O	O	O	O							O	2	B	1			1	
5	Autoclave, table top	1		1	O	O	O	O	O	O								2	B	1	1		2	
6	Micromotor drill	1		1	O	O	O	O	O	O								1	B	1			1	
7	Air motor drill	0			O	O	O	O	O	O							O	2	B				1	
8	Mini plating kits	1	1		O	O	O	O	O	O							O	2	B		1		1	
9	Micro plating kits	1	1		O	O	O	O	O	O								1	B		1		1	
10	Pulse oximeter	0			O	O	O	O	O	O								1	B				1	
11	Laser unit for maxillofacial	0			O						O	O						1	C				0	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final
I. Radiology section		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty	
1	Ultrasound scanner unit	1		1	O	O	O	O	O	O								1	B	1			1	
2	Personal computer and a	0															O	1	C				0	
3	Computer table	0															O	1	C				0	
4	General X-ray unit	2	1	1	O	O	O	O	O	O								1	A	1			1	
5	Fluoroscopy X-ray unit	0			O	O	O	O	O	O								1	B				1	
6	Mobile X-ray unit	2	1	1	O	O	O	O	O	O								1	A	1			1	
7	Film mark set	1		1	O	O	O	O	O	O							O	3	B	1	1		2	
8	X-ray film storage cabinet	0			O	O	O	O	O	O								1	B				1	
9	X-ray protective aprons	3		3	O	O	O	O	O	O								3	B	3			3	
10	Aprons hangers	3		3	O	O	O	O	O	O								3	B	3			3	
11	Cassettes pass box	2	2		O	O	O	O	O	O						O		1	B				0	
12	Panoramic X-ray unit	0			O	O	O	O	O	O								1	B				1	
13	Dental X-ray unit	1		1	O	O	O	O	O	O								1	A	1			1	
14	X-ray film illuminator for	2		2	O	O	O	O	O	O							O	3	B	2			2	
15	X-ray film illuminator for 4	1		1	O	O	O	O	O	O							O	2	B	1			1	
16	X-ray cassettes with screen	2	1	1	O	O	O	O	O	O								1	A	1			1	
17	Lead glass and doors	2	2		O	O	O	O	O	O								1				1	1	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final
J. Laboratory		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty	
1	Colony counter for	0			O	O	O	O	O	O								1	B				1	
2	Spectrophotometer	2	1	1	O	O	O	O	O	O								1	A	1			1	
3	pH meter	1		1	O	O	O	O	O	O								2	B	1	1		2	
4	Auto hematology analyzer	0			O	O	O	O	O	O			O					1	C				0	
5	Freezer, small	0			O	O	O	O	O	O								1	B				1	
6	Medical refrigerator	4	1	3	O	O	O	O	O	O							O	5	B	3			3	
7	Water distillation apparatus	2		2	O	O	O	O	O	O							O	2	B	1			1	
8	Microplate rotator	0			O	O	O	O	O	O								1	B				1	
9	Water bath	3	2	1	O	O	O	O	O	O								2	B	1	1		2	
10	Pipette washer	0			O	O	O	O	O	O								1	B				1	
11	Aspirator	0			O	O	O	O	O	O								1	B				1	
12	Laboratory incubator	2		2	O	O	O	O	O	O								2	B	2			2	
13	Laboratory table	4	2	2	O	O	O	O	O	O								2	B	2			2	
14	Glassware set	1	1		O	O	O	O	O	O								1	B				1	
15	Autoclave for Microbiology	1		1	O	O	O	O	O	O								2	B	1	1		2	
16	Binocular microscope	10	6	4	O	O	O	O	O	O							O	10	B	4			4	
17	Micro pipettes set	1	1		O	O	O	O	O	O								1	A		1		1	
18	Automatic micropipet set	0			O	O	O	O	O	O								1	A				1	
19	Standard wire loop set for	1	1		O	O	O	O	O	O								1	A		1		1	
20	Automatic tissue processor	0			O	O	O	O	O	O								1	B				1	
21	Microtome and knives	0			O	O	O	O	O	O								1	B				1	
22	Wax bath set	0			O	O	O	O	O	O								1	B				1	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D			Result			Final

K. Labor Room		Q'ty	working	not working	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	Q'ty	Priority	Replace	Add	New	Q'ty		
1	Oxygen flow meter	6	3	3	○	○	○	○	○	○	○	○	○	○	○	6	B	3				3	
2	Infant warmer	1		1	○	○	○	○	○	○	○	○	○	○	○	2	A	1				1	
3	Nebulizer	0			○	○	○	○	○	○	○	○	○	○	○	1	B			1		1	
4	Suction apparatus	6	3	3	○	○	○	○	○	○	○	○	○	○	○	7	B	3				3	
5	Delivery bed	6		6	○	○	○	○	○	○	○	○	○	○	○	6	B	6				6	
	Labor bed	0			○	○	○	○	○	○	○	○	○	○	○	24	B				9	9	
6	Cardiotocograph (CTG)	3	1	2	○	○	○	○	○	○	○	○	○	○	○	4	B	2				2	
7	Fetal doppler unit	2	1	1	○	○	○	○	○	○	○	○	○	○	○	4	B	1	1			2	
8	Medical refrigerator	1		1	○	○	○	○	○	○	○	○	○	○	○	4	B	1				1	
9	Freezer, small	0			○	○	○	○	○	○	○	○	○	○	○	2	B				1	1	
10	Ultrasound scanner unit for	0			○	○	○	○	○	○	○	○	○	○	○	1	B				1	1	
11	Baby suction unit	1	1		○	○	○	○	○	○	○	○	○	○	○	6	B		3			3	
12	Vacuum extractor	0			○	○	○	○	○	○	○	○	○	○	○	2	A				1	1	
13	Emergency resuscitator	0			○	○	○	○	○	○	○	○	○	○	○	2	B					0	
14	Autoclave, table top	0			○	○	○	○	○	○	○	○	○	○	○	2	B				1	1	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D		Result			Final
L. Premature Baby Unit (PBU)		Q'ty	working	not working	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	Q'ty	Priority	Replace	Add	New	Q'ty		
1	Infant incubator	8	6	2	○	○	○	○	○	○	○	○	○	○	○	6	B	2				2	
2	Pulse oximeter	1		1	○	○	○	○	○	○	○	○	○	○	○	6	B	1	3			4	
3	Syringe pump	4	1	3	○	○	○	○	○	○	○	○	○	○	○	6	B	3	1			4	
4	Infusion pump	0			○	○	○	○	○	○	○	○	○	○	○	4	B				2	2	
5	ECG monitor	0			○	○	○	○	○	○	○	○	○	○	○	3	B				1	1	
6	Laryngoscope for neonatal	1	1		○	○	○	○	○	○	○	○	○	○	○	4	B		2			2	
7	Laryngoscope for pediatrics	0			○	○	○	○	○	○	○	○	○	○	○	2	B				2	2	
8	Autoclave, table top	0			○	○	○	○	○	○	○	○	○	○	○	1	B				1	1	
9	Phototherapy unit	4	1	3	○	○	○	○	○	○	○	○	○	○	○	3	B	2				2	
10	Sphygmomanometer set for	1			○	○	○	○	○	○	○	○	○	○	○	1	B		1			1	
11	Transport incubator	1		1	○	○	○	○	○	○	○	○	○	○	○	1	B	1				1	
12	Glucometer	0			○	○	○	○	○	○	○	○	○	○	○	3	B					0	
13	Infant ventilator	0			○	○	○	○	○	○	○	○	○	○	○	1	A				1	1	
14	Portable infant ventilator	0			○	○	○	○	○	○	○	○	○	○	○	1	B					0	
15	Resuscitator table	1		1	○	○	○	○	○	○	○	○	○	○	○	3	A	1				1	
16	Ambue bag for neonatal	0			○	○	○	○	○	○	○	○	○	○	○	4	A				3	3	
17	Ambue bag for pediatrics	0			○	○	○	○	○	○	○	○	○	○	○	2	A				2	2	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D		Result			Final
M. New PBU unit		Q'ty	working	not working	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	Q'ty	Priority	Replace	Add	New	Q'ty		
1	Infant incubator	0			○	○	○	○	○	○	○	○	○	○	○	4	B				4	4	
2	Baby cot	0			○	○	○	○	○	○	○	○	○	○	○	6	B					0	
3	Phototherapy unit	0			○	○	○	○	○	○	○	○	○	○	○	2	B				2	2	
4	Resuscitator table	0			○	○	○	○	○	○	○	○	○	○	○	2	B				2	2	
5	Baby suction unit	0			○	○	○	○	○	○	○	○	○	○	○	2	B				2	2	
6	Infant ventilator	0			○	○	○	○	○	○	○	○	○	○	○	1	B				1	1	
7	Pulse oximeter	0			○	○	○	○	○	○	○	○	○	○	○	2	B				2	2	
8	Syringe pump	0			○	○	○	○	○	○	○	○	○	○	○	4	B				2	2	
9	Infusion pump	0			○	○	○	○	○	○	○	○	○	○	○	2	B					0	
10	Glucometer	0			○	○	○	○	○	○	○	○	○	○	○	1	B				1	1	
11	Apnea monitor	0			○	○	○	○	○	○	○	○	○	○	○	4	C					0	
12	ECG monitor	0			○	○	○	○	○	○	○	○	○	○	○	1	B				1	1	
13	Treatment & Drug carrying	0			○	○	○	○	○	○	○	○	○	○	○	2	B				1	1	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D		Result			Final
N. Wards		Q'ty	working	not working	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	Q'ty	Priority	Replace	Add	New	Q'ty		
1	Suction apparatus	6		6	○	○	○	○	○	○	○	○	○	○	○	8	B	6				6	
2	Sphygmomanometer	8	4	4	○	○	○	○	○	○	○	○	○	○	○	16	B	4				4	
3	Nebulizer	4		4	○	○	○	○	○	○	○	○	○	○	○	12	B	3				3	
4	Ambue bag	4		4	○	○	○	○	○	○	○	○	○	○	○	12	B	4				4	
5	Syringe pump	0			○	○	○	○	○	○	○	○	○	○	○	8	B					0	
6	Infusion pump	0			○	○	○	○	○	○	○	○	○	○	○	8	B					0	
7	Medical Refrigerator	30	25	5	○	○	○	○	○	○	○	○	○	○	○	10	B	5				5	
8	Patient trolley	32	12	20	○	○	○	○	○	○	○	○	○	○	○	50	B	10				10	
9	X-ray film illuminator for	0			○	○	○	○	○	○	○	○	○	○	○	10	B				6	6	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced	Minutes of B/D		Result			Final
O. Sterilization Unit		Q'ty	working	not working	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	Q'ty	Priority	Replace	Add	New	Q'ty		
1	Autoclave, large size	3	1	2	○	○	○	○	○	○	○	○	○	○	○	3	B	2				2	
2	Autoclave, medium size	0			○	○	○	○	○	○	○	○	○	○	○	3	B				1	1	
3	Instrument sterilizer, large	1		1	○	○	○	○	○	○	○	○	○	○	○	2	B	1	1			2	
4	Instrument sterilizer, medium size	3		3	○	○	○	○	○	○	○	○	○	○	○	4	B	3	1			4	
5	Stainless sink unit for CSSD	1		1	○	○	○	○	○	○	○	○	○	○	○	1	B	1				1	
6	Storage cabinet for dressing container	2		2	○	○	○	○	○	○	○	○	○	○	○	4	B	2	1			3	

7	Cart for dressing container	0			○			○	○	○							1	B			1	1	
8	Dressing container set	2	2		○			○	○	○							○	2	B		1	1	
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced Minutes of B/D		Result			Final	
P. Health Education Unit		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty
1	Video camera	0			○			○	○	○								1	B			1	1
	Video deck and TV monitor	0			○			○	○	○												2	2
2	Overhead projector	0			○			○	○	○								1	A			1	1
3	Slide projector and screen	0			○			○	○	○								1	A			1	1
4	CPR training manikin set,	0			○			○	○	○								1	A			1	1
	CPR training manikin set,	0			○			○	○	○												1	1
5	White writing board set	1	1		○		○	○	○	○								1	B		1		1
6	Desk top computer set	0			○			○	○	○								1	B			1	1
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced Minutes of B/D		Result			Final	
Q. Maintenance unit		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty
1	Electric maintenance	1		1	○			○	○	○								1	B	1			1
2	Mechanic maintenance	1		1	○			○	○	○								1	B	1			1
3	Maintenance tool set	1		1	○			○	○	○								1	B	1			1
		Existing equipment			Prioritized reasons						Deleted reasons						Reduced Minutes of B/D		Result			Final	
R. Other equipment		Q'ty	working	not working	①	②	③	④	⑤	⑥	①	②	③	④	⑤	⑥	①	Q'ty	Priority	Replace	Add	New	Q'ty
1	Washing machine	0			○			○	○	○							○	4	B			3	3
2	Drying machine	0			○			○	○	○								2	B			2	2
3	Incinerator for medical waste	0			○			○	○	○								1	B			1	1
4	Ambulance	5	4	1	○	○	○	○	○	○					○			1	B				0
5	Mortuary cooler for 2 bodies	3		3	○	○	○	○	○	○								3	A	3			3
6	Autopsy table	1		1	○	○	○	○	○	○								1	B	1			1
7	Autopsy instruments set	1	1		○		○	○	○	○								1	B		1		1
8	Ironing machine	0			○			○	○	○								1				1	1

2-3 Basic Design

2-3-1 Design Policies

1) Natural Condition

Matara district is located in a tropical climate zone which is warm and humid throughout the year with an average temperature of 27 degrees. The period from April to October is the rainy season of the year, and the annual precipitation reaches around 1,200 mm.

2) Social Condition

The population of Matara district comprises Sinhalese (94.5%), Muslims (2.5%), and Tamils (2.9%).

3) Industries

The main industry of Matara district is agriculture, and major agricultural products are rice, black tea, rubber, coconuts, cinnamon, pepper and vegetables. The manufacturing industry of the province is centered around the processing of the above mentioned farm products, producing textile, rubber, cinnamon oil, lemon oil, black tea, and coconut oil. In addition, Matara district has other minor industries such as coastal fishery and tourism, so there are resort hotels and fishing ports on the seaside. As it is located between Galle district and Hambantota district in the southern region of Sri Lanka, Matara district is also a center of commerce in the region.

4) Local Representatives of Manufacturers

In Colombo, there are many local representatives of European, American and Japanese manufacturers (refer to a document attached to this report), and they provide after-sales service. About half of them are financially viable companies and are well known to provide reliable services.

Each representative has technical experts to provide after-sales services (those who have graduated from universities are recognized as engineers, and the others are referred to as technicians). In the local representative's office, generally, each of the engineers and technicians is specialized in his own expertise, and many engineers have completed training programs which are offered by the respective manufacturers

5) Maintenance Capability of the Executing Agency

At present, the medical equipment of the hospital is maintained by the Biomedical Engineering Services (BES) of the MOH, who performs daily checkups on the spot and maintenance work at the workshop of the hospital. However, the hospital depends on local representatives of medical equipment manufacturers for periodical inspections on the medical equipment. Also, repair work on high technology items is also carried out by these

representatives. It is confirmed that the items of medical equipment procured on this Project will be also taken care of in the same way. The engineers of the local representatives who are trained by the manufacturers have expertise and special tools to deal with difficult problems and to repair the equipment. On this Project, it is planned that the system for maintaining the equipment be strengthened by increasing the number of engineers stationed in the hospital in cooperation with the BES, by concluding maintenance agreements with the local representatives of respective manufacturers, and by improving the maintenance tools of the workshop of the hospital. It is considered that there will be little problem in maintaining the equipment after the implementation of the Project.

6) Items of Equipment and their Grades

The items of equipment and their grades are determined in accordance with the policy described in the above section "Basic Concept of the Project". Specifically, the items and their grades are determined in consideration of the activities of the hospital and expected benefits resulting from the procurement of such items and also in consideration of how widely such items are used in Sri Lanka.

7) Work Schedule

It is expected that about nine months be needed for the execution of the Project after the conclusion of an exchange of note between both the governments. The work schedule planned for the Project is detailed in a table titled "Total Work Schedule".

8) Procurement

(1) Procurement from other countries

It is preferable that the following items of medical equipment are selected from the products of manufacturers who have local representatives in Sri Lanka: respirators (D-2 in the equipment list) and X-ray diagnostic apparatus (I-5) which require periodical inspections, and blood gas analyzers (D-7) and automatic blood cell counters (J-4) which need a large amount of consumable supplies. If the local representatives of medical equipment manufacturers are taken into consideration for after-sales service, then, for some items, it is not possible to procure Japanese products, or the option for selecting products suitable for the hospital can be very limited if the items to be procured on the Project are specified as Japanese products. For such items, it is desirable to include products which are manufactured in countries other than Sri Lanka and Japan, in order to hold a fair bidding that can allow an option for selecting locally popular products.

(2) Local procurement

All products of medical equipment available in Sri Lanka are imported because there is no local company who produces such items. It is safely assumed that there will be no possibility of procuring any item locally on the Project.

9) Transportation

(1) Procurement from Japan (transportation from Japan to the hospital)

A port in Galle is the nearest port and about 40 kilometers away from Matara town, where the hospital is located, but there is no regular freight service to the port. Because of this reason, the items shipped from Japan will be unloaded at a port in Colombo, and then, they will be transported over the land to Matara town, about 200 kilometers to the south. After customs clearance, the transportation is carried out during the night time because there is a regulation that prohibits daytime transport by truck to alleviate the traffic jam in Colombo. The inland transportation to Matara town can be completed in a single night because the transportation route takes a main highway, which is well-paved without any obstacle. Furthermore, forwarding companies have their own cranes and unpacking tools, so there will be no problem.

(2) Procurement from countries other than Japan

Products made in countries other than Japan shall be procured on on-site delivery with cost, insurance and freight included (CIF ON SITE). In this case, such products are shipped from the storage buildings of the local representatives of respective manufacturers in Colombo.

(3) Container-stack yard

The hospital does not have a lot large enough to place or stack all the containers that are expected to arrive there. Therefore, the containers arrived are placed on several sites. However, this will not impede the smooth execution of the installation work.

2-3-2 Basic Designs

1) Overall Plan

The hospital to be improved on the Project is located in Matara town, which is at the southernmost edge of the island of Sri Lanka. The hospital has been expanded, after its establishment, to the present 30 three-story buildings. Some buildings are old. For example, the pediatrics ward was built a few decades ago. On the other hand, the construction of a new maternity block for the obstetrics and gynecology department was just completed in the site of the hospital in March, 2001. In addition, repair and expansion work is now being carried out for the emergency outpatient department and the ICU, and the infrastructure is being improved by constructing a water supply tower and an underground water tank. The work will be completed by the March of the next year.

As for the condition of the medical equipment, many items are obsolete, and there is a severe shortage of medical equipment. In this condition, the hospital is not able to meet the current demand for medical care, which is increasing after the hospital was raised to a status of

general hospital in 1994 to serve for the current zone, providing medical care to patients not only living in Matara district but also coming from Hambantota district, i.e., a neighboring province. The items of medical equipment used for examination such as X-ray apparatus are especially unsatisfactory, so it is difficult to perform treatments and operations in satisfying manners. As a result, the hospital cannot meet the demand for operations in emergency care and in obstetrics and gynecology. Therefore, the items of medical equipment to be procured on the Project are determined appropriately in consideration of this condition and also of the financial aspect and the maintenance system of the hospital.

2) Equipment Plan

(1) Size of the Project

In a talk held during the field study, the Sri Lanka party and the Japanese party agreed on that this Project should improve the functions of the hospital to provide quality medical care, to train the hospital staff, and to educate public hygiene and primary health care to the people living in the region. As a result, it is clear that the procurement of medical equipment on the Project be carried out for the existing wards of the medical departments and for the newly built maternity block.

The items of equipment requested by the Sri Lanka party for the procurement have been studied in consultation with the persons in charge of the respective medical departments and in accordance with the policies of medical equipment selection determined by the Japanese party, and the talk of the items to be procured on the Project was concluded in a meeting held at the last field study. However, as for the items of medical equipment that are to be introduced to the hospital on the Project, further study should be conducted in Japan to determine whether such items are really necessary for the hospital to perform the present activities, or to achieve the objectives of the Project.

The following is the outline of the study and determination.

① Renewal of and supplementation to the existing items

The condition of the existing medical equipment was studied by visual inspection and in consultation with the persons in charge of the respective medical departments. In addition, the capacity of the hospital to provide examinations and treatments at present was analyzed from the information which is collected through questionnaires to and meetings with the persons in charge. Furthermore, if there is some relation between the existing items and the requested items, then the quantities requested for such items were discussed to determine whether the renewal of or the supplementation to such items was really necessary and appropriate.

② Possibility for procurement of new items

The necessity and appropriateness of introducing new items of medical equipment on the Project was discussed on the basis of the present activities of the hospital.

(2) Medical Equipment Studies

In the above mentioned study, the renewal of or the supplementation to the existing items and the introduction of new items are examined, and the results of the study are reflected on the items requested, which are presented as an equipment list. The following sections describe major items studied for the respective departments of the hospital. Here, additionally, the function of each department and its objectives for improvement on the Project are examined for appropriateness to confirm the benefits which are expected by the Sri Lanka party. Also, confirmation is made for the space to install the equipment which will be procured on the Project.

① Condition of the existing equipment

The items of the existing medical equipment and their quantities are listed below for each department. In the study, the study team confirmed that the following items had been procured by a Japanese grant assistance executed in 1986: two sterilizers, a dental treatment console, an X-ray apparatus, an ultrasound diagnostic apparatus, an autoclave, two incubators, and three corpse refrigerator.

Table 2-2 Present status of the existing equipment

Department		Chiefly Existing Equipment (Q'ty)
A. Emergency Treatment Unit		ICU Bed 2, Oxygen Flow Meter 2, Suction Apparatus 2, Sphygmomanometer 2, Laryngoscope 2
B. Operation Unit	Operation Unit A	Anesthesia Machine 4, Shadowless Lamp 1, Electro Surgical 1, Suction Apparatus 3, Operation Table 2, Artificial Ventilator 1, Neonate Treatment Table 1, Defibrillator 1, Pulse Oximeter 2, Sterilizer (M) 2
	Operation Unit B	Anesthesia Machine 3, Shadowless Lamp 2, Electro Surgical 1, Suction Apparatus 2, Operation Table 2, Artificial Ventilator 1, ECG Monitor 1, Defibrillator 1, Pulse Oximeter 1, Sterilizer (middle 1, Large 1, 1986 Japan Grant -2 sets), Laparoscopic Peripheral 1
C. Endoscopy Unit		Gastrointestinal fiberscope set 1, Colono fiberscope set 1, Light sources for endoscopes set 1, Disinfections trolley 1, Broncho fiberscope set 1
D. ICU (5 beds)		ICU bed 4, Ventilator for ICU 3, Pulse oxymeter 3, Defibrillator 2, ECG monitor 3, Instrument cabinet 2, Oxygen flow meter set 4
E. CCU(4 beds) ICCU (12 beds)		Respirometer 1, Suction apparatus 2, Defibrillator 1, Bedside monitor 2
F. Outpatient Clinical	ENT	Pure Tone Audiometer 1, Impedance audiometer 1, Bull's eye lamp set for ENT 1, Spot lamp
	Others	Sphygmomanometer
G. OPD Clinical	Out-patient	Slit lamp with tonometer 2, Echo unit for Ophthalmology, A & B scan 1

	Operation Theatre	Operation microscope, Anesthesia with ventilator
E. Dental / Facial Orthopedics	Dental Out-patient	Dental chairs with compressor 5, Autoclave, table top 1
	Facial Orthopedic Out-patient	Dental chairs 2, Autoclave, table top 1
I. Radiology Unit		General X-ray unit 2, Mobile X-ray unit 2
J. Laboratory		Autoclave for Microbiology 1, Laboratory Incubator 2, Spectrophotometer 2, Water distillation apparatus 2, Binocular microscope 6
K. Labor Room		Delivery bed 6, Cardio-tocograph (CTG) 3, Suction apparatus 7, Oxygen flow meter 6, Medical refrigerator 1, Infant warmer 1
L. PBU		Infant Incubator 8, Pulse oxymeter 1, Photo-therapy unit 4, Transport incubator 1, Laryngoscope for neonatal 1, Resuscitator table 1, Syringe pump 4
M. New PBU		(It will be opened in grand floor of New OB & GYN.)
N. Ward		BP apparatus, Stretcher, Medical Refrigerator
O. Sterilization Unit		High Pressure Sterilization 3, Container for Sterilizer, Cabinet
P. Health Education Unit		White board 1, Blackboard 1, OHP 1 (rent)
Q. Maintenance Unit		Basic implement and tool
R. Others		Washing Machine (for house use) 2, Ambulance 4, (second hand made in Japan, 2 sets) Mortuary Cooler 3, (Japan's Grant 1986 - 3 sets) Autopsy table 1 unit, Power Generator 2 units.

② Study of major items requested

Major items of the medical equipment requested are studied and determined as follows.

Table 2-3 Results of determination for major items

Equipment	Discussion contents
1. Laparoscope	At present, laparoscopes are used in operating rooms, and laparoscopes requested are to be used mainly for surgical operations. Because the staff has experience, and there is no problem of use environment, laparoscopes for surgical operations are considered for the procurement on the Project.
2. Orthopedic Surgical	There is a plan to receive a plastic surgeon in January, 2001. The specifications of the equipment necessary for practicing orthopedics were discussed with a surgeon who performs cosmetic surgical operations during the field study. As for this item, equipment and instruments that can be used commonly in surgical procedures are considered for the procurement.
3. Endoscope (Gastro, Duodeno, Colono and Broncho)	Endoscopic examinations are carried out in the operation preparation rooms and the endoscopy room of the internal medicine ward. Endoscopes currently used are for the digestive organs and the bronchus. Electronic endoscopes had been requested originally, but conventional fiberscopes were chosen for the procurement after a talk with the surgeon who are in charge of endoscopic examinations.

4. Ultrasonic Diagnosis Apparatus with Color Doppler	The doctor in charge of ultrasonic examinations described eagerly the hospital's need of an ultrasonic diagnostic apparatus which has a color doppler function for examination of patients with cardiovascular disease. Because the hospital has been using only one linear ultrasonic apparatus, the study team considers that it will be difficult for the hospital to effectively use a color doppler ultrasonic apparatus in examinations. Therefore, instead of a color doppler ultrasonic apparatus, an ultrasonic apparatus with a cardio-echo function is considered for the procurement on condition that the hospital acquire a cardiologist.
5. Computer & Printer (Radiology)	There are three computers in the accounting section of the hospital, but no computer is used at any of the medical departments. In this condition, it is considered that a computer, if it is procured only for the radiology department, cannot be used in any effective manner.
6. Digital Fluoroscopic X-ray apparatus	Judging from the scale and the functions of the hospital, the necessity of fluoroscopic X-ray apparatus is high. However, if the present condition that the hospital has no fluoroscopic X-ray apparatus is considered, then this item, which is to be procured on the Project, need not be of a digital type. Therefore, conventional type fluoroscopic X-ray apparatus are considered for the procurement.
7. Ortho pantmo graph X-ray	This item is requested by the maxillo facial surgery department (MFS). Because a dental X-ray apparatus does not provide some functions which are necessary for examinations and treatments in facial orthopedics, a panorama type dental X-ray apparatus is planned for the procurement.
8. Central Monitor System (4 beds)	A central monitoring system is requested by the CCU department. At present, this department has only four beds for cardiac care, and the patients are monitored by nurses visually and manually. In this condition, the necessity for a central monitoring system is low. Therefore, instead of this item, bedside monitors are planned for the procurement.
9. Delivery Bed	There is no differentiation of labor rooms from delivery rooms in the hospital, which condition is different from an average Japanese hospital. As a result, expectant mothers are using the same beds for labor and child delivery. In consideration of this condition, six delivery beds and nine labor beds are planned for the procurement, instead of 24 delivery beds requested.
10. Washing Machine and Dryer	At present, soiled clothes and linens are laundered by an outside laundry. To economize on expenses, the hospital plans to do the laundry by itself and has requested laundry machines. However, there is not a room in the buildings suitable for installation of laundry machines, so the hospital has proposed a plan to construct a new building, so that the laundry machines provided will be installed appropriately.
11. Incinerator	All the medical wastes from the hospital are carried and processed by an outside public disposer. The MOH as a guide line that recommends medical facilities like general hospitals to dispose medical wastes properly inside their facilities. Therefore, an incinerator is considered for the procurement on this Project. This incinerator should be used only to process medical wastes, which can be a source of secondary infection.
12. Ambulance	The hospital owns four ambulances. Two of them are made in Japan and given to the hospital secondhand by the local Rotary Club. The secondhand ambulances are very old, so a new ambulance is requested. However, the existing ambulances are used not only for patient transportation but also for transportation of supplies and staffers. In this condition, it is considered that if the ambulances are used only for patient transportation, then the existing ambulances can handle sufficiently the hospital's need of patient transpiration. Therefore, this

	item is eliminated from the consideration.
13. Health Education Equipment	There are office room and lecture space for the constantly study of staffs and nurses as well as health education for the pregnancy women and patients. It is considered that a video camera and a computer is effective for making educational materials. Therefore, those items are planned to procure.

In the basic design of the Project, items are selected and their quantities are adjusted on the basis of the above mentioned design policies. Specifically, after the field work, the appropriateness of the items which are marked with priority order "A" or "B" in the equipment list attached in the minutes of the meeting was examined in an analysis conducted in Japan. As for the items which are marked with priority order "C", their inappropriateness was clear at the time of the field study, so they are excluded from the procurement. The assistance policy for each department, which is derived from the results of the analysis, is described in the following section, (4) Assistance Policy for each Department. In addition, reasons for the selection or the change of major items are described in the succeeding section, (5) Determination of the Equipment.

3) Assistance Policy for each Department

The basic policy of planning the medical equipment procured on the Project is to limit the selection of items to medical equipment which improves the quality of medical care provided by the hospital. In accordance with this policy, the highest priority should be directed to medical departments which provide medical care directly to patients. Other departments are studied in their relation to medical care, and the items requested for the latter are examined to prove necessity and propriety. In this way, an equipment plan is drawn up.

Table 2-4 Assistance Policy for each Department

Department		Assistance Policy
A. ETU (Emergency Treatment Unit)		<ul style="list-style-type: none"> • There is a plan to increase the number of beds from one to three and the operational hours from 12 to 24 hours. For this transition into a new system, it is necessary to renew and supplement the existing equipment.
B. Operation Unit	Operation Room A	<ul style="list-style-type: none"> • The equipment will be improved to use two operating tables efficiently • By supplementing the existing equipment, the number of operations performed will be increased. • For this improvement to be effective, the Sri Lanka party must partition the operating room.
	Operation Room B	<ul style="list-style-type: none"> • * The equipment will be improved to use an operating table efficiently. • By supplementing the existing equipment, the number of operations performed will be increased.

	Operation Room for OB/GY	<ul style="list-style-type: none"> The equipment will be improved to use two operating tables efficiently. For this improvement, the Sri Lankan party must partition the operating room.
C. Endoscopic Unit		<ul style="list-style-type: none"> By renewing the existing old equipment (endoscopes for the stomach, colon and bronchus, etc.), the diagnostic function will be improved. By procuring a video monitor, training function will be added to this department.
D. ICU (Intensive Care Unit)		<ul style="list-style-type: none"> For a capacity increase from the current four beds to five beds, the existing equipment is supplemented, and some dilapidated items of the equipment are renewed. The management of patient respiration, drug administration, etc. will be improved.
E. CCU		<ul style="list-style-type: none"> The existing equipment is supplemented to improve the care provided with the current four beds. The functions of respiration management and of cardiac examination are improved on condition that the hospital acquire a cardiologist.
F. OPD Clinic		<ul style="list-style-type: none"> Items of basic medical equipment which are characteristic to each department are renewed or supplemented.
G. OPD	Out-patient	<ul style="list-style-type: none"> By procuring items of medical equipment which are in shortage, the current demand for ophthalmological care will be satisfied.
	Operation Room	<ul style="list-style-type: none"> To meet the current demand for ophthalmological operations such as corneal transplants, the dilapidated equipment is renewed and supplemented.
H. Dental/Maxillo facial	Out-patient for Dental	<ul style="list-style-type: none"> To meet the current demand for dental care, the items in shortage are supplemented.
	Maxillo facial	<ul style="list-style-type: none"> To meet the current demand for oral surgeries and facial orthopedic surgeries, items of surgical equipment and instruments in shortage are supplemented.
I. Radiology Unit		<ul style="list-style-type: none"> To improve the function of diagnostic examination to include examination of the alimentary system, the existing X-ray apparatus and ultrasonic diagnostic apparatus are renewed or introduced.
J. Laboratory		<ul style="list-style-type: none"> To meet the current sterilization need, the existing equipment is renewed and supplemented.
K. Obstetrics and Gynecology		<ul style="list-style-type: none"> This department is created to meet the increasing demand for obstetric and gynecological care. On the Project, necessary items are procured to make the department serviceable. At present, the labor rooms are used also as delivery rooms. This practice will be completely changed by separating the rooms to labor rooms and to delivery rooms in a new layout.
L. Pediatrics (PBU)		<ul style="list-style-type: none"> There is a plan to accommodate patients referred from other medical facilities and patients with infectious disease. To meet the current increasing demand for pediatric care, the dilapidated equipment will be renewed, and items in shortage will be supplemented.

M. Pediatrics (New PBU)	<ul style="list-style-type: none"> To treat patients here who would otherwise be referred to a higher level hospital, items necessary for tertiary care are procured.
N. Wards	<ul style="list-style-type: none"> To improve the quality of care to inpatients, basic items will be procured for use in the wards.
O. Sterilization Unit	<ul style="list-style-type: none"> To meet the current need for sterilization, the dilapidated and broken equipment will be renewed.
P. Health Education Unit	<ul style="list-style-type: none"> The educational function of the hospital will be improved to provide in-hospital service training, intern training and hygienic education to local people.
Q. BES Unit	<ul style="list-style-type: none"> A system for maintaining the equipment is planned in coordination with the BES headquarter.
R. Others	<ul style="list-style-type: none"> Laundry service will be started inside the hospital.. Medical wastes will be processed in the hospital.

4) Determination of the Equipment

The following is the results of the determination conducted for equipment selection on the basis of the above-mentioned policy.

The explanation for each equipment is as follows.

[Note: "×" in No. column means elimination as planning.]

[A. ETU]

For this department, basic items of equipment necessary for emergency care are procured. Many existing items such as electrocardiographs, sterilizers, beds for seriously ill patients, oxygen flow meters and sphygmomanometers, which are old and broken, should be replaced with new ones to improve the function of providing emergency care. In addition, basic items of medical equipment such as bedside monitors, a defibrillator, infusion pumps, pulse oximeters, a cart for emergency care, stretchers for patient transfer and medical examination tool sets are supplied to improve the quality of emergency care. Furthermore, it is appropriate to procure basic items such as a pharyngoscope, a surgical instrument set and an aspirator in minimum required quantities for improvement of medical examination.

As for the request for ultrasonic nebulizers, because the two existing nebulizers can be used sufficiently for the three beds of the ETU, it is appropriate to exclude this request from the procurement consideration. The use and quantity of each item are described in the following table.

* Q/R = Quantity requested, Q/P = Quantity planned

No	Equipment	Use, necessity and quantity	Q/R	Q/P
A-1	Bedside Monitor	This item is used to monitor the electrocardiograph, heart rate and respiration rate of a patient receiving emergency care. It is considered that one monitor will be used sufficiently for the three beds used for emergency care as a patient receives care for one hour in	2	1

		average. Therefore, one monitor will be introduced here on the Project		
A-2	Defibrillator	It is used for defibrillation of the ventricle in emergency care. It is appropriate to procure one defibrillator for the ETU.	1	1
A-3	Infusion Pump	It is used to manage the infusion of a physiological solution and blood transfusion to a patient. It is considered that two pumps can be used sufficiently for the three beds. Therefore, two pumps will be introduced on the Project.	2	1
A-4	Pulse Oximeter	It is used to measure continuously and percutaneously the oxygen saturation rate in the blood of a patient. It is considered that two oximeters can be used sufficiently for the three beds. Therefore, two oximeters will be introduced on the Project.	2	2
A-5	Emergency Resuscitator	It comprises a cart and an oxygen cylinder and used to let a patient breathe oxygen gas. It is appropriate to introduce one resuscitator to the ETU.	1	1
A-6	Laryngoscope	It is an instrument for examining the larynx. One laryngoscope for adult will be supplied.	1	1
A-7	ECG Machine	It is used for taking electrocardiogram of a patient. It is essential for the emergency treat, so one ECG is considered appropriate for three beds of ETU.	1	1
A-8	Sterilizer, table top	It is used to sterilize instruments made of steel such as forceps by boiling. This is a basic item for medical care. One unit is planned to be renewed.	2	1
A-9	ICU Bed	It is used as a bed for an emergency patient or a seriously ill patient. It is necessary to procure two beds, one for the renewal of an existing dilapidated bed and the other as a supplement. New beds will help the ETU expand its capacity from one bed at present to three beds.	2	2
A-10	Emergency Cart	It is a cart for carrying instruments and materials that are used for treatment. As it is a basic item, it is appropriate to procure one cart for one treatment room.	1	1
A-11	Stretcher Trolley	It is used to carry a patient to a ward or to an operating room. It is considered that two stretchers can be enough for the three bed ETU. Therefore, two stretchers will be introduced on the Project.	2	2
A-12	Oxygen Flow Meter	It is used to control the flow and humidity of oxygen gas administered to a patient. It is considered that two flow meters can be used effectively in the three bed ETU.	2	1

		Therefore, one oxygen flow meter will be procured to supplement one existing flow meter.		
A-13	Minor Surgical Instrument Set	It is a set of instruments used for delicate surgical treatments. Two sets are suitable to treat patients who are accommodated in the three bed ETU. One set will be procured to supplement the one existing set.	1	1
A-14	Set of Ophthalmic and Otolaryngoscope	They are basic items of medical equipment. Two sets are sufficient for the three bed ETU. Therefore, one set will be procured to supplement the one existing set.	1	1
A-15	Sphygmomanometer	It is a basic instrument for measuring the blood pressure. It is appropriate to procure a desktop sphygmomanometer and a stand type sphygmomanometer for supplementation.	2	2
A-16	Clinical Set for ETU	It is a set of basic diagnostic instruments such as a stethoscope, a percussion tool, etc. It is necessary to procure one set for one treatment room.	1	1
A-17	Ultrasonic Nebulizer	It is a medical device to nebulize a medicine for administration to a patient. Two sets are sufficient for the three bed ETU. Therefore, one set will be procured to supplement the one existing set donated recently.	2	1
A-18	Suction Apparatus	It is a basic item of medical equipment which extracts body fluids during treatment. Two aspirators are sufficient for the three bed ETU. Therefore, one aspirator will be procured to supplement the one existing aspirator.	2	1

[B. Operation department]

This department will be improved to satisfy the current demand for surgical operations by renewing and supplementing the existing equipment.

The deterioration of the medical equipment is clearly seen on such items as cystoscopes, pulse oximeters, anesthesia apparatus, instrument cabinets, stretchers, and medicine refrigerators. Therefore, these items should be renewed to remove obstacles to the provision of quality medical care. Also, the existing wash hand basin is deteriorated, so this basin should be replaced, and a new basin will be placed at a spot which is more convenient for personnel movement.

Such items as defibrillators, electro-cautery devices, and ECG monitors are in shortage, so the existing equipment in operating rooms A and B are renewed and supplemented.

Furthermore, the following items are planned to be introduced: a dermatome for dermatological operations, an oxygen flow meter and recovery beds for a recovery room, a set of forceps which are used with a laparoscope for surgical procedures, an electric drill, an electric saw, a set of bone-plate screws for surgical operations, an operation microscope for otorhinological operations, and sets of rhinoscopes and pharyngoscopes. For the ophthalmology operating room, sterile water suppliers for washing the hands are planned to be introduced for

cleanliness. Moreover, a capnometer will be procured to monitor the condition of a patient, in addition to ECG monitors. These items are basic and essential to provision of medical care.

On the other hand, the following items requested for orthopedic surgeries are eliminated from the procurement because the hospital does not have an orthopedic surgeon, and these items cannot be specified to be useful: an ecarteur, semi-artificial limbs (semi-artificial bones), an instrument for measuring artificial limbs, and dynamic hip screws.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
B-1	Cystoscope Set	It is used for examination of the urinary bladder and extraction of foreign bodies from the bladder. It is necessary for medical care, so one cystoscope is procured to renew the existing cystoscope which is in deterioration.	1	1
B-2	Pulse Oximeter	It is used to measure continuously and percutaneously the oxygen saturation rate in the blood of a patient. One oximeter is procured to renew the existing broken oximeter, which can be used in operating rooms A and B.	1	1
B-3	Defibrillator with Monitor	It is used for defibrillation of the ventricle. It is appropriate to place one defibrillator for each operating room. Therefore, one defibrillator is procured to renew the existing broken defibrillator for operating rooms A and B.	3	1
X	Electro-surgical unit	Because this is the same as what is listed in B-7, this item is eliminated.	4	0
B-4	Operating Microscope for ENT	It is used for performing minute operations in otorhinology. One operation microscope is planned for the procurement to replace the existing deteriorated and broken operation microscope.	2	1
B-5	Anesthesia with Ventilator	It is used to perform general anesthesia to a patient prior to an operation. One anesthesia apparatus is procured to replace the existing dilapidated unit used in operating rooms A and B.	1	1
B-6	Surgical Scrub Station Unit	This item is used for hand washing before performing a surgical operation. Two units are procured to replace the two broken units used in operating rooms A and B.	2	2
B-7	Electro-surgical Unit	It is used in surgical operations to incise and coagulate body tissues. Two electro-surgical units are procured to replace the existing two broken units for operating rooms A and B.	3	2
B-8	Dermatome	It is used to collect skin as skin grafts for epidermization. One dermatome is introduced for use in dermatological operations.	1	1
B-9	Oxygen Flow Meter	It controls the flow and humidity of oxygen gas administered to a patient under oxygen therapy. One each oxygen flow meter is procured newly for	1	2

		operating rooms A and B.		
B-10	Pediatrics Surgical Instrument Set	It is a set of instruments made of steel such as forceps used in pediatric care. At present, there is one set of such instruments, but it is not enough for providing medical care smoothly. One set will be procured as a supplement.	1	1
B-11	Surgical Instrument Set	It is a set of instruments made of steel such as forceps used for adult patients. There is one set, but it is considered not enough for smooth provision of medical care. One set will be procured as a supplement.	1	1
B-12	ECG Monitor	It is used for recording electrocardiogram of a patient to monitor the frequency of tachycardia, bradycardia or arrhythmia. One ECG monitor is necessary for each operating room, so three ECG monitors are procured, two monitors as replacements for operating rooms A and B.	3	2
X	Suction Apparatus	Because the existing four aspirators can be used effectively in the department of this size, so this item is eliminated from the consideration.	10	0
X	Rent Drill	Because this is the same as B-29 "Electric drill," this item is eliminated.	1	0
B-13	Instrument Cabinet	It is used to store instruments and keep them clean. One cabinet is necessary for each operating room, so two cabinets are procured to renew the existing equipment for operating rooms A and B.	3	2
X	Cart	It is a cart to carry instruments, etc. for operations. Because the existing four carts can be used effectively and sufficiently in the department of this size, so this item is eliminated from the procurement.	2	0
B-14	Recovery Bed	It is used for a patient who is recovering from anesthesia or who is being monitored after an operation. One such bed is necessary and appropriate for each of operating rooms A and B, so two recovery beds will be introduced on the Project.	3	2
B-15	Stretcher	It is used to carry a patient to a ward or to an operating room.	2	2
B-16	Sterilizing Hand Washing Unit	This item is used for hand washing prior to performing surgical operations. One such unit is necessary for each operating room. One unit is procured for the ophthalmology operating room. As for operating rooms A and B, two such units are included in the item listed as B-7.	4	1
B-17	Medical Refrigerator	It is used to store pharmaceutical products and preparations which need refrigeration. One such refrigerator is necessary and	1	1

		appropriate for each of operating rooms A and B, so one unit will be procured to supplement the existing one refrigerator.		
X	Operation Table	Because the existing units can be used in operating rooms A and B, this item is not considered for the procurement.	0	0
X	Shadowless Lamp	It is used to illuminate an operation table during an operation. This item is eliminated because the existing equipment is still usable in operating rooms A and B.	0	0
B-18	Laparoscopic Forceps Set	It is a set of forceps used with a laparoscope in an operation. Only one set of manipulation forceps will be introduced on the Project.	1	1
X	Retractors for hip exposure set	It is an instrument for orthopedic surgery. There is no orthopedic surgeon in the hospital, so these items are eliminated from the procurement plan.	0	0
X	Hemiprosthesis (Hip)		1	0
X	Instruments to calibrate size of prostheses		11	0
X	Instrument for dynamic Hip screws set		1	0
B-19	Bone Drill	It is a tool used in orthopedic surgery. As it is a basic item for orthopedic surgery, one electric drill is procured for the operation department These items are used by a doctor in otorhinology for performing an operation. It is an item essential for performing an operation, so one unit for each item will be introduced on the Project.	1	1
B-20	Bone Saw		1	1
B-21	Bone Plate & Screws Set		1	1
B-22	Capnometer	It measures the carbon dioxide content in the exhaled breath of a patient under anesthesia and monitors the respiration of the patient. It is an item essential for monitoring the breathing of a patient under general anesthesia, so one capnometer will be introduced for the operation department.	1	1
B-23	Nasopharyngoscope Set for ENT	The hospital is advised to partition the operating rooms.	1	1
B-24	Laryngoscope set for ENT		1	1

[B'. Operating room for new obstetrics and gynecology department]

For an operating room which is opened on the first floor of the new obstetrics and gynecology ward, items basic and essential for performing operations in obstetrics and gynecology are planned for the procurement on the Project.

The following items will be introduced in quantities suitable for use with two operating tables: two operating tables, two operation lights, two anesthesia apparatus, two aspirators, two

ECG monitors, a pulse oximeter, a defibrillator, an electro-surgical unit, an instrument cabinet, an instrument cart, a recovery bed, a stretcher, a sterile water apparatus for hand washing and an medicine refrigerator.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
B'-1	Pulse oximeter	It is used to measure continuously and percutaneously the oxygen saturation rate in the blood of a patient. It is considered that one oximeter can be used sufficiently in an operating room, so one oximeter will be introduced on the Project.	1	1
B'-2	Defibrillator with monitor	It is used for defibrillation of the ventricle. It is appropriate to place one defibrillator for an operating room, so one unit will be procured.	1	1
B'-3	Anesthesia with ventilator	It is used to perform general anesthesia to a patient prior to an operation. Two anesthesia apparatus are planned to be procured for use with the two operating beds.	2	2
B'-4	Electro surgical unit	It is used in surgical operations to incise and coagulate body tissues. It is appropriate to place one electrosurgical unit for an operating room, so one unit will be introduced on the Project.	1	1
B'-5	ECG monitor	It is used for recording electrocardiogram of a patient to monitor the frequency of tachycardia, bradycardia or arrhythmia. It is appropriate to place one each ECG monitor for an operating bed, so two units will be introduced on the Project.	1	2
B'-6	Suction apparatus	It is a basic item of medical equipment, which extracts body fluids during treatment. Two aspirators are planned for use with the two operating tables.	2	2
B'-7	Instrument cabinet	It is used to store instruments and keep them clean. One cabinet is procured for this operating room.	1	1
B'-8	Instrument cart	It is a cart for carrying instruments and used as an instrument table for operations. It is appropriate to procure two carts for the two operating tables.	2	2
B'-9	Recovery bed	It is used for a patient who is recovering from anesthesia or who is being monitored after an operation. One recovery bed is procured for this operating room.	1	1
B'-10	Stretcher trolley	It is used to carry a patient to a ward or to an operating room. Two stretchers will be procured for use with the two operating tables.	2	2
B'-11	Sterilizing hand washing unit	It is used for hand washing prior to performing an operation. One unit is necessary for an operating room. Two new units are planned in correspondence	2	2

		with the two units used in the existing obstetrics operating room		
B'-12	Medical Refrigerator	It is used for storing pharmaceutical products and preparations which need refrigeration. One refrigerator is necessary and appropriate for this new obstetrics operating room.	1	1
B'-13	Operating table	It is used to position a patient for an operation. The height and angle of the table are adjustable. Two operating tables are planned for this new obstetrics operating room.	2	2
B'-14	Shadowless lamp	It is used for illuminating a patient during an operation. Two units are planned for use with the two operating tables.	2	2

[C. Endoscope department]

At present, the hospital has three endoscopes, each for examination of the stomach, colon and bronchus, and it also has a light source apparatus, which is used with the endoscopes. However, only the endoscope for the stomach is now usable, so this endoscope is used also for the examinations of the colon and bronchus. This gastroendoscope and the light source apparatus are old, and this condition is impeding the provision of endoscopic examinations. For the hospital to function as a general hospital, it is important to renew the endoscopic equipment. Therefore, the endoscopes used for examination of the stomach, colon and bronchus together with the light source apparatus and the sterilization wagon used for the endoscopes should be renewed on the Project. In addition, a video monitor set will be introduced to improve the diagnostic function of the hospital, and an endoscope cabinet will be also introduced to keep the endoscopes safely after sterilization. Furthermore, because the examination of the bronchus is performed in another room, it is necessary to procure a set of a light source apparatus, an aspiration pump, a sterilization wagon, a cart and a leak tester separately for the bronchoendoscope.

As for an endoscope for the duodenum, requested, it is excluded from the procurement plan because it is expected that reverse pancreatocholangiography (ERCP) performed at the X-ray fluoroscopy room will not be performed after the rearrangement of the hospital layout on the Project. Also an endoscope specialized for examination of the sigmoid colon, which is originally requested, is eliminated from the procurement because the colonoendoscope can be used also for this purpose. The following table describes the utilization, necessity and quantity for each item.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
C-1	Gastrointestinal fiberscope set	It is used for examination of the stomach and removal of foreign bodies, and also for biopsy. One gastro-endoscope is planned for the procurement to renew the existing deteriorated counterpart.	1	1
X	Duodeno fiberscope set	It is used for examination of the duodenum, reverse cholangiopancreatography (ERCP), and biopsy. This item is eliminated because it is not possible	1	0

		for this department to perform reverse pancreatocholangiography.		
C-2	Colono fiberscope set	It is used for examination of the colon and removal of foreign bodies, and also for biopsy. One colonoendoscope is procured to renew the existing deteriorated counterpart.	1	1
X	Sigmoid fiberscope set	This item is eliminated from the procurement because the above mentioned colonoendoscope set offers a similar function and can be used for examination of the sigmoid colon.	1	0
C-3	Video monitor set	It is used to display on a CRT, images of the part examined by an endoscope. It is useful for training students and for studying diseased parts. Because it is useful for training staff members, one set will be introduced on the Project.	1	1
C-4	Light sources for endoscope	It is a light source, which provides a function of lighting to an endoscope connected thereto. One unit is planned for the procurement to renew the existing deteriorated unit used for the gastroendoscope and colonoendoscope.	1	1
C-5	Disinfections container	It is an instrument to sterilize and cleanse endoscopes. One unit is planned for newly procurement for gastrointestinal fiberscope and colono fiberscope.	1	1
C-6	Fiberscopy cabinet	It is a cabinet to keep endoscopes and equipped with a sterilization lamp. One unit is planned for newly procurement for endoscopes.	1	1
C-7	Broncho fiberscope set	It is used for examination of the bronchus and removal of foreign bodies, and also for biopsy. At present, the hospital lacks a bronchoendoscope, so the gastroendoscope is used for the examinations which should be really performed with a bronchoendoscope. Therefore, a bronchoendoscope set will be introduced on the Project.	1	1
X	Light source for Broncho fiberscope	It is a light source to an endoscope. An endoscopic unit will be established in one place. So, this unit is eliminated because this is overlapping with item C-4.	1	0
C-8	Endoscopic suction pump	It is used to provide a suction function to an endoscope. One unit will be procured for the bronchoendoscope.	1	1
X	Disinfection trolley	It is used to wash and sterilize endoscopes. An endoscopic unit will be established in one place. So, this unit is eliminated because this is overlapping with item C-5.	1	0
C-9	Bronchoscopy procedure cart	One unit will be procured for the bronchoendoscope.	1	1
C-10	Leakage tester	One unit will be procured for the bronchoendoscope.	1	1