STUDY REPORT
ON
THE PROJECT
FOR
IMPROVEMENT OF MEDICAL EQUIPMENT
OF
THE SIEM REAP HOSPITAL
IN
THE KINGDOM OF CAMBODIA

APRIL 2000

Japan International Cooperation Agency (JICA)

Contents

PREFACE

In response to a request from the Royal Government of Cambodia, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Medical Equipment of the Siem Reap Hospital and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Cambodia a study team from December 5 to December 26, 1999.

The team held discussions with the officials concerned of the Royal Government of Cambodia, and conducted a field study at the study area. After the team returned to Japan, further studies were made, 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 Royal Government of Cambodia for their close cooperation extended to the teams.

April, 2000

Kimio Fujita
President
Japan International Cooperation Agency (JICA)


East China Sea
Combodia
Indian Ocean
0 50 100 km
0 50 100 mi
THAILAND
LAOS
COMBODIA
Siem Reap
Battambang
Tonle Sap
Mekong
PHNOM PENH
VIETNAM
Shihanoukville
Ho Chi Minh
Gulf of Thailand
South China Sea

Chapter 1 Background of Request

In the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), a large number of highly destructive anti-personnel landmines were deployed in sporadic fighting that broke out in the 1970s and settled roughly in the early 1990s. Even today, four to six million landmines are estimated to be laid within the country. According to the statistics for a period between January and October 1999, most landmine victims live in the northwestern part of the country, with Battambang, Otdar Mean Cheay, Banteay Mean Cheay and Siem Reap being the top four provinces. Although the number of landmine victims is decreasing each year as the country's political situations stabilize, provision of medical and rehabilitation services for the victims remains extremely important in the face of 1,358, 1,597, and 866 victims being registered nationwide in 1997, 1998, and 1999 (January - October) respectively.

The condition of the health sector in Cambodia is at the lowest level in the West Pacific region, as indicated by its average life expectancy and infant and maternity mortality rates, which are higher than those of Laos, but lower than those of Thailand and Vietnam. Malaria is the leading cause of death in all age groups followed by tuberculosis.

According to the "National Health Policies and Strategies 1999 - 2003" drafted by the Ministry of Health, the Royal Government of Cambodia has given priorities to the provision of basic health services, decentralization of finance and administration in the health sector, and development of human resources. The government aims at promoting maternal and child health, expanding the users of public medical services, and improving the technical and administrative capabilities of referral hospitals throughout the country. The Ministry of Health has been implementing a nation-wide medical system reform since 1997 and plans to establish appropriate numbers of national hospitals, referral hospitals, and health centers by reorganizing existing medical institutions.

However, only 5 to 6% of the national budget has been allocated annually to the Ministry of Health, 80% of which is taken up by labor and operational costs, including pharmaceutical costs. Thus, the Ministry of Health's annual budget is not sufficient to fund the medical system reform, and it probably cannot be implemented as planned without financial aid from international organizations, as well as governments and NGOs of other countries.

The Siem Reap Hospital is a referral hospital positioned to offer the highest-level medical services for landmine victims in Siem Reap Province, one of the northwestern provinces registering the largest numbers of landmine victims. However, most of the hospital's medical instruments, which are secondhand articles donated by international organizations and NGOs, are old or lack in quantity to provide appropriate medical care services.

As a part of the referral hospital enhancement program of the Ministry of Health, the Royal Government of Cambodia has requested the government of Japan grant aid for constructing an emergency ward for landmine victims and procuring medical equipment for Siem Reap Hospital. Of

the two requests, the Government of Japan decided to conduct a study to examine the possibility of grant aid for the provision of basic medical equipment because of its higher urgency.

Chapter 2 Contents of the Project

2-1 Objectives of the Project

The Ministry of Health has been implementing a nationwide medical system reform and plans to reorganize existing medical facilities into eight national hospitals (tertiary care), 65 referral hospitals (secondary care), and 913 health centers (primary care) by 2002. The Medical System Reform Project has the elevation of the following capabilities as an object of the improvement of referral hospitals: treating emergency patients, abnormal delivery, and tuberculosis, as well as executing general surgical operations, admission of inpatients, and x-ray and ultrasonic examinations.

Siem Reap Province is situated at the central part of northwestern Cambodia, in which Siem Reap Hospital is the only institution that is positioned to treat landmine victims and provide secondary care as a referral hospital. This Project, based on the Ministry of Health's objectives to upgrade referral hospitals, will focus on the improvement of the operating theatres, ICU, emergency room, and surgical department and provide basic medical equipment for these critical departments. As a result, the Project aims at improving the public medical services, including those for landmine victims, and contributing to the enhancement of medical activities of the referral hospital in Siem Reap Province.

2-2 Basic Concept of the Project

This Project aims at improving the medical service capabilities of the Siem Reap Hospital and supporting landmine victims in Siem Reap Province and neighboring regions by assisting the Royal Government of Cambodia's plan to upgrade the medical equipment of the hospital. More specifically, the Project plans to provide funds for procuring 71 basic medical instruments, mainly for the hospital's operating theatres, ICU, emergency room, surgical department.

2-3 Basic Design

2-3-1 Design Concept

This Project was designed based on the following principles:

- Maintenance of the equipment must be easy.
- Scale, contents, and specifications should be appropriate for the skill levels of Cambodian staff.
- Priorities should be given to the replacement and supplementation of existing equipment that is aged or lacks in quantity.
- As a rule, the equipment should not require construction work for installation.
- The equipment should be able to effectively improve the medical service qualities in the dentistry, obstetrics/gynecology, tuberculosis, and other general departments.
- A minimum amount of consumables/spare parts necessary for the startup of the equipment to be procured should be provided (In principle, Cambodian side is responsible for the procurement of consumables/spare parts).

The initial request made by the Royal Government of Cambodia consisted chiefly of high-tech equipment, such as CT scanners, various types of endoscopes, X-ray apparatus, and color Doppler imaging. However, after examining the number of physicians and patients, as well as the technical levels of the hospital staff in this study, it was decided to select items that did not require special training for operation.

2-3-2 Basic Design

The name, quantity, and purpose of each equipment item to be provided through this Project are shown in the Table 1.

Table-1: Name, Quantity and Purpose of Equipment to be Provided through the Project

No.	Equipment Name	Qty	Purpose
1	2-Crank Standard Bed with Mattress & Mosquito Net*	5	bed for inpatients (with 2 cranks, mosquito net, mattress)
2	3-Crank Gatch Bed with Mattress & Mosquito Net*	5	bed for inpatients (with 3 cranks, mosquito net, mattress)
3	Air Conditioner*	2	for laboratory and emergency ward (window type, 6.5kw)
4	Air Massager*	1	for physiotherapy room (compressor, 20w)
5	Air Way*	13	for emergency room, I.C.U., and operation room (Berman type and Guedel type)
6	Ambu Bag	8	for emergency room (made of silicone, with 4 masks)
7	Ambulance	1	belonging to emergency room (4400cc, diesel-electric, left handle)
8	Ambulance*	1	belonging to emergency ward (4400cc, diesel-electric, left handle)
9	Anesthesia Apparatus*	1	for operation room (with vaporizer for halothane)
10	Autoclave	2	for laboratory (16L, 121oC or 132oC)
11	Autoclave Vertical 100L Electric	1	for laboratory (100L, 2atm, 132oC)
12	Basic X-Ray System*	1	for X-ray room (apron, glasses, gloves)
13	Bicycle Exerciser*	1	for physiotherapy (made of steel, with timer and speed meter)
14	Binocular Microscope	1	for laboratory (with light, binocular)
15	Breathing Bag Set*	2	for operation room (made of rubber, with 2 tubes and 5 bags)
16	Caesarian Set	1	for gynecologic operation (made of steel)
17	Computer and Printer	1	for office (64MB, Windows 98, laser printer)
18	Copy Machine	1	for office (size of sheet: A4 and A3)

No.	Equipment Name	Qty	Purpose
19	Cover Glass*	1	for laboratory (25mm x 25mm)
20	Cylinder Truck*	1	for emergency room (6000L)
21	Delivery Table*	1	for obstetrics and gynecology (hydraulic pedal)
22	Dental Chair Mounted Unit	1	for dental (electricity consumption: 1.5kVA, with air compressor)
23	Digital Micro Pipette Set*	2	for laboratory (step size: 0.002, 0.01, 0.2, 0.1 μ 1)
24	Doppler Fetal Heart Detector*	1	for obstetrics and gynecology (2.5MHz, 600mW)
25	Dressing Container*	1	for autoclave (stainless steel)
26	Dressing Drum*	1	for autoclave (stainless steel)
27	Electric Aspirator	4	for operation room (3L x 2 aspiratory bottles)
28	Electric Traction Unit with Bed*	1	for physiotherapy (with bed, traction 100kg)
29	Electro surgical Unit*	2	for operation room (mode: incision 300W, coagulation 150W, bl ending 120W, bipolar 20-50W)
30	Endotracheal Tube Different Size	8	for emergency room and operation room (dia.: 3.0, 4.0, 5.0, 7.0, 8.0, 9.0 mm x 10 respectively)
31	Face Mask*	20	for I.C.U. (material: silicone, size: L, M, S)
32	Foot Aspirator*	4	for I.C.U. (maximum aspiratory pressure: 300 mg)
33	Freezer	1	for laboratory [preservation of blood serum etc.] (400L, -30oC)
34	Gastroscope	1	for diagnostic (mounted on trolley, with video unit
35	Glass Ware Set*	2	for laboratory (made of glass)
36	High and Low Stretcher*	3	for emergency room etc. (height adjustable)
37	Incubator	1	for laboratory (37oC, 730W, natural convection)
38	Instrument Cabinet*	2	for operation room (stainless steel, 1200 x 450 x 1700 mm)
39	Kick Bucket*	2	for operation room (stainless steel)
40	Laryngoscope	12	for emergency room etc. (stainless steel, Macintosh)
41	Manual Processing Set*	1	for mobile X-ray apparatus (tank capacity: 18L, 1 heater: 600W)
42	Microwave Therapy Unit*	1	for physiotherapy (electricity consumption: 1200VA, frequency of oscillation: 2450MHz)
43	Mobile Room Air Sterilizer with Stand*	1	for operation room (electricity consumption: 230VA, U.V. output: 15W x 2)

No.	Equipment Name	Qty	Purpose
44	Mobile X-Ray Unit*	1	for X-ray (maximum rating: 32kw, voltage in tube: 40-125kv, current in tube: 160-400mA)
45	OHP and Screen	1	for office (halogen lamp: 300W, projective distance: 2m)
46	Operating Instrument Set*	1	for operation room (material: stainless steel, including wound fixer [forceps])
47	Operation Light	2	for operation (halogen lamp: 40W, with 10 bulbs)
48	Operation Table	2	for operation room (tabletop, dimension: 450 x 1900 mm)
49	ORL Surgical Instrument Set	1	for dental (stainless steel)
50	Oxygen Cylinder with Flow-meter*	1	for emergency room (6m3, with flow-meter)
51	Oxygen Extractor	2	for operation room (8L/min, oxygen generation rate: 90%±3%)
52	Portable Ventilator*	3	for emergency room etc. (the amount of ventilation: 200-900ml, the number of respirations per minute: 5-40/min, with battery and slar panel)
53	Radio for Former District Hospitals	7	for emergency room (136MHz-174Mhz, 40W)
54	Radio for the Ambulance	1	for emergency room (with antenna, 136Mhz-174MHz, 20W)
55	Revolving Chair*	2	for operation room (made of steel)
56	Slide Glass*	1 box	for laboratory (finishing of edge: polished with water, frosting)
57	Sphygmomanometer, Aneroid Type	7	for hospital (0-300 mmHg)
58	Sphygmomanometer, Table-top Type	7	for hospital (0-300 mmHg, desktop type)
59	Stand for Solution Bottles*	36	for inpatients (standing type, with caster)
60	Standard Bed with Mattress & Mosquito Net*	172	for inpatients (with side rail, mattress and mosquito net)
61	Standard Wheel Chair*	5	for I.C.U. and physiotherapy (material: steel, wheel size: front 7 inches, rear 24 inches)
62	Stethoscope	18	for diagnosis (material: plastic, double scope)
63	Electric Aspirator	1	for obstetrics and gynecology (with absorption cups, 1000 mL x 2)
64	Surgical Suture Needle Set*	2	for operation room (with surgical suture of nylon and blade silk)
65	Tool Set*	1	for ophthalmic [for manufacturing glasses] (various type of nippers and screwdrivers
66	Transcutaneous Stimulator*	1	for physiotherapy (frequency: 0-100 Hz)

No.	Equipment Name	Qty	Purpose
67	Treatment Light＊	1	for obstetrics and gynecology (standing type, with caster, 75W)
68	Uterine Curette Set	1	for operation room (material: stainless steel)
69	Video Recorder	1	for office (multiple type, threefold speed)
70	X-Ray Film Cassette＊	1	for X-ray (cassette size: 140 x 170, 140 x 140, 110 x 140, 100, 120, 80 x 100 mm)
71	X-Ray Film Dryer＊	1	for X-ray (material: stainless steel, hanger size: maximum 140 x 170 mm, 750W x 2 [heater])

Of the items listed in Table-1 above, asterisked ones were not included in the initial request, but were added because the Cambodian side requested them during the survey and the study team confirmed that they were essential to the improvement of the hospital's medical services.

The result of the evaluation of the requested equipment is outlined in Table-2.

Evaluation of Requested Equipment

[Criteria for Evaluating Requested Equipment]

1. Priority Items

1) Basic items necessary for general diagnosis and treatment.
2) Main items that need to be replaced due to antiquation or breakage.
3) Items that can be maintained within the hospital's capabilities in terms of operators' skill levelsand the hospital's financial standing.
4) Items for which spare parts, reagents, etc., are locally procurable.

2. Criteria for Evaluation

1) Necessity
   ○: Indispensable to the hospital's medical activities, needs enhancement or supplementation, or requires renewal due to antiquation or breakage of existing equipment.
   ×: Not essential to the hospital's medical activities, expected to benefit only a small number of patients, or is easily obtainable by the Cambodian side.

2) Skill levels of operators
   ○: Operable by the current staff (similar equipment already exists, as well as personnel who can operate it properly.)
   ×: Requires advanced skills and may not be operable by the current staff.

3) Equipment specifications
   ○: Appropriate for its purpose and usage.
   ×: Needs to be simplified or switched to a lower-specification model.

4) Allocation and quantity
   ○: Appropriate.
   ×: Needs modification according to the hospital's management system and/or the number of patients.

5) Maintenance
   ○: Maintainable within the current system or by the local agent of the equipment manufacturer.
   ×: Requires sophisticated maintenance techniques and does not have a local agent to render maintenance services.

6) Maintenance costs (consumables, reagents, spare parts, etc.)
   ○: Requires a minimum maintenance cost.
   ×: Incurs a high maintenance cost and likely to benefit only a small number of patients.

7) Others

3. Overall Judgment based on the Evaluations Above

○: Appropriate.

△: Needs modification in terms of quantity or specification.

×: Will be excluded from the equipment plan.

Table 2: Evaluation of Requested Equipment

<Requested Equipment>

Item No.	Equipment name (English)	Requested quantity	Judgment	Priority	Evaluation						Note
					Necessity	Skill level	Specification	Quantity	Maintenance service	Maintenance cost	
1	REFRIGERATOR 2CH	4	×	A	×	—	—	—	—	—	
2	THERMO CAUTHER	2	△	A	○	○	○	×	○	○	to be added as two types of sphygmomanometer
3	OPERATION LIGHT	2	○	A	○	○	○	○	○	○	
4	OPARATING TABLE	2	○	A	○	○	○	○	○	○	
5	ELECTRIC ASPIRATOR	3	○	A	○	○	○	×	○	○	
6	PATIENT OPERATION MONITORING UNIT	5	×	A	×	—	—	—	—	—	
7	OXIMETER	6	×	A	×	—	—	—	—	—	
8	LARYNGOSCOPE	4	△	A	○	○	○	×	—	—	the required quantity to be changed to 12
9	AMBU VENTILATION	4	△	A	○	○	○	×	○	○	the required quantity to be changed to 8
10	EXTRACTOR	4	△	A	○	○	○	×	○	○	the required quantity to be changed to 2
11	ENDOTRACHEAL TUBE DIFFERENT SIZE	1	△	A	○	○	○	×	○	○	the required quantity to be changed to 8
12	TENSIOMETER	10	×	A	×	—	—	—	—	—	
13	VENTILATOR	4	△	B	○	×	×	×	○	○	to be changed to 3 portable ventilators
14	ABOMINAL SURGERY SET	2	×	A	×	—	—	—	—	—	
15	UROLOGCAL SURGERY SET	2	×	A	×	—	—	—	—	—	
16	GYNECOLOGICAL SURGERY	1	△	A	○	—	—	—	—	—	to be consolidated into general

Item No.	Equipment name (English)	Requested quantity	Judgment	Priority	Evaluation						Note
					Necessity	Skill level	Specification	Quantity	Maintenance service	Maintenance cost	
	SET										surgery set
17	VASCULAR SURGERY SET	1	○	A	×	—	—	—	—	—	
18	PLASTIC SURGERY SET	1	△	A	×	—	—	—	—	—	to be consolidated into general surgery set
19	ORL SURGERY SET+TABLE	1	△	A	○	○	○	×	○	○	
20	ORL CONSULTATION SET	1	×	A	×	—	—	—	—	—	
21	DENTAL SET	1	○	A	○	○	○	○	○	○	
22	ECHO DOPPLER	1	×	C	×	—	—	—	—	—	
23	INCUBATOR	2	×	A	×	—	—	—	—	—	
24	KERAMANN ASPIRATOR	2	○	A	○	○	○	○	○	○	
25	UTERINE CURETTE SET	3	△	A	○	○	○	×	○	○	
26	CAESARIAN SET	1	△	A	○	○	○	×	○	○	
27	CT SCANNER	1	×	C	×	—	—	—	—	—	
28	AUTOCLAVE VERTICAL 100L, ELECTRIC	2	△	A	○	○	○	×	○	○	
29	INCUBATOR	2	△	A	○	○	○	×	○	○	
30	AUTOCLAVE	15	△	A	○	○	○	×	○	○	
31	FREEZER FOR BLOOD BANK	1	△	A	○	○	○	×	○	○	to be changed to freezer for blood serum
32	GASTROSCOPE	1	○	A	○	○	○	○	○	○	
33	COLONOSCOPE	1	×	A	×	—	—	—	—	—	
34	CYSTOSCOPE	1	×	A	×	—	—	—	—	—	

Item No.	Equipment name (English)	Requested quantity	Judgment	Priority	Evaluation						Note
					Necessity	Skill level	Specification	Quantity	Maintenance service	Maintenance cost	
35	LAPAROSCOPE	1	×	A	×	—	—	—	—	—	
36	CENTRIFUGE	2	×	A	×	—	—	—	—	—	
37	BINOCULAR MICROSCOPE	2	△	A	○	○	○	·	○	○	
38	BIOCHEMISTRY ANALYZER	1	×	C	×	—	—	—	—	—	
39	X-RAY APPARATUS	1	△	B	○	○	×	×	○	○	to be changed to mobile type
40	X-RAY FILM PROCESSOR	1	△	B	○	○	×	○	○	○	to be changed to manual type
41	PRINTING PAPER	1	×	B	×	—	—	—	—	—	
42	GEL FOR ULTRASONIC AND ELECTRICAL TRANSMISSION	1	×	B	×	—	—	—	—	—	
43	MASHINE RONEO ELECTRIC	1	×	A	×	—	—	—	—	—	
44	COMPUTER & PRINTER	1	○	A	○	○	○	○	○	○	
45	COPY MACHINE	1	○	A	○	○	○	○	○	○	
46	TV & VIDEO	2	△	A	○	○	×	×	○	○	TV to be excluded
47	OHP & SCREEN	1	○	A	○	○	○	○	○	○	
48	AMBULANCE	1	△	B	○	○	○	×	○	○	Siem Reap: 1, Health Center: 1
49	RADIOS FOR IN THE AMBULANCE AND HEALTH CENTER	10	△	A	○	○	○	×	○	○	Siem Reap: 1, Health Center: 6, Ambulance: 1

Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Concept

(1) Selection of Equipment

Equipment to be procured through this Project should be selected based on the following six guidelines:

1) Maintenance of the equipment should be easy.
2) The equipment should be basic one appropriate for the skill levels of the Cambodian staff.
3) Priorities should be given to the supplementation and replacement of existing aged equipment.
4) In principle, the equipment should not require construction work for installation.
5) Priorities should be given to the equipment for the operating theater, ICU, emergency room, and surgical department in order to aid landmine victims.
6) CT scanners, various types of endoscopes (except for gastroscopes), color Doppler imaging, and other technically sophisticated equipment enlisted in the initial request will be excluded.

(2) Quantity

By taking into account the number of patients and doctors and the composition of common diseases, the quantities of medical instruments to be procured were determined so as not to exceed those of the existing instruments except for a few items.

(3) Scope of Works

This Project will procure only basic medical equipment that do not require construction work for installation. The Japanese side will hand over the equipment at Siem Reap Hospital. Thus, the responsibilities of the Japanese side consist of the procurement of the equipment and the transfer thereof from the loading port (Yokohama) to Sihanoukville port by sea and therefrom to Siem Reap Hospital by land. Locally procured items will be transported from Phnom Penh to Siem Reap by air.

(4) Consultant Supervision

A Japanese engineer will be dispatched to supervise the handing-over of the equipment.

(5) Implementation System of the Cambodian Side

The implementing agency of the Cambodian side is Siem Reap Hospital, and the responsible agency is the Ministry of Health.

3-1-2 Implementation Schedule

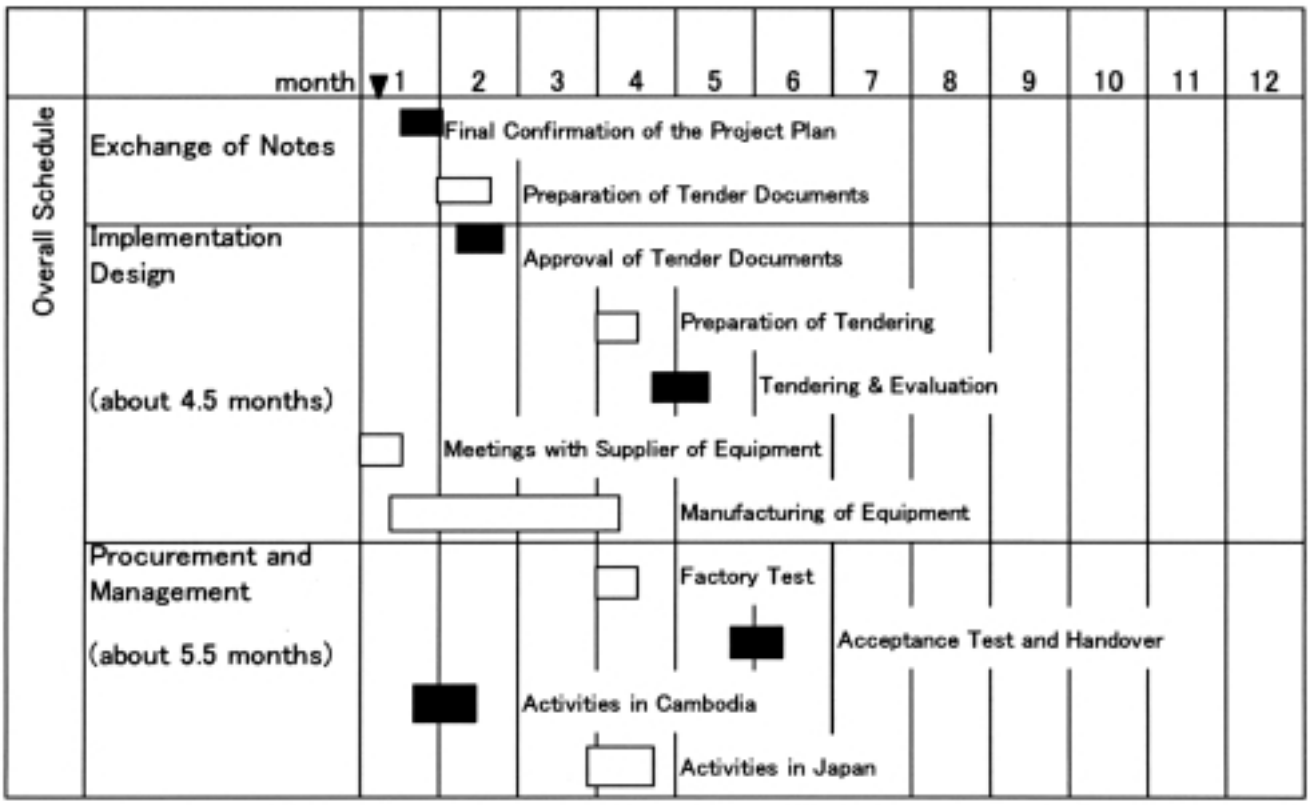
(1) The fiscal year

This Project is implemented in the year 1999.

(2) Schedule

According to the Japan's Grant Aid Program, the project implementation schedule was determined as follows:

The overall schedule (from E/N to handover)	:	10 months
From E/N to Supply Contract	:	4.5 months
Delivery (from supply contract to handover)	:	5.5 months



3-1-3 Procurement Plan

(1) Equipment Suited for Local Procurement

a. Air-conditioner

This Project plans to procure models that are widely used in Cambodia. Window-type 200V air-conditioners are hard to obtain in Japan and more expensive than those sold in Cambodia. Therefore, it is desirable to procure air-conditioners locally.

b. Computer and Printer

This Project plans to procure computers and printers that are widely used in Cambodia. Local models are more desirable as they require local services for installing software in Khmer language, as well as for maintenance.

c. Copy Machine

This Project plans to procure copy machines that are widely used in Cambodia. Local models are more desirable as they require local services for maintenance.

d. Radio Communication

This Project plans to procure a radio communication system that is widely used in Cambodia. Local models are more desirable as they require local services for maintenance.

e. Oxygen Cylinder

This Project plans to procure oxygen tanks that are widely used in Cambodia. There is only one company in Cambodia that manufactures oxygen cylinders and one company that fills tanks with oxygen. If oxygen cylinders were procured in Japan, the oxygen company might encounter a problem in dealing with three different types of screw threads: DIN (Germany), BS (Britain), and CGA (the United States). Thus, local procurement is more desirable.

(2) Packing for Transport

Equipment for this Project will be procured in Japan and transported from Yokohama port to Sihanoukville port by sea. After unloading at Sihanoukville port, the equipment will be stored at a bonded warehouse and clear through the customs with a duty-free certificate issued by the Central Customs House in Phnom Penh, and transported in the original container from Sihanoukville to Phnom Penh by land.

3-1-4 Obligations of Recipient Country

Listed below are items that Cambodia is responsible for in the implementation of this Project. Although most of the articles to be procured through this Project will not require installation work, it was agreed between both countries that the Cambodian side will take care of the preparation work appurtenant to the installation of air-conditioners, dental examination set, and operation lights.

1) To secure the space necessary for the storage of the equipment and materials to be procured through this Project.
2) To make certain that the equipment to be provided through this Project will be used properly and effectively and that necessary personnel will be allocated. Also, to bear all expenses for the maintenance and control of the equipment and other costs necessary for the implementation of this Project except for expenses covered by grant aid.
3) To clear the equipment through the customs of the Kingdom of Cambodia and exempt the equipment from import duties and other taxation.
4) To pay notice fees and payment charges of Authorization to Pay (A/P) issued on the basis of Banking Arrangement (B/A).

3-2 Operation and Maintenance Plan

This Project plans to procure basic medical equipment that is generally easy to maintain. Of the articles to be provided, portable ventilators, electrosurgical knives, anesthesia apparatus, X-ray devices, and gastroscopes are relatively expensive and require periodic maintenance and control. Except for the gastroscopes, all other expensive items are replacements of the existing ones and thus can be maintained by each department in charge that is experienced in handling such articles. There is a specialized doctor who has received 10 years of special training overseas and highly skilled in maintaining and controlling the new type of gastroscopes.

Hospital beds, which have the largest quantity among the articles on the equipment list, will not incur additional cost for maintenance and control. Further, most of equipment items to be provided in this Project are intended to replace superannuated ones and hence it would be anticipated that no significant increase of cost for maintenance and control would incur.

As the hospital is not adequately equipped to repair broken medical equipment, the hospital is allowed to request the medical engineering team of the medical engineering center established within the Cambodian Red Cross to dispatch engineers or provide repair services free of charge. The six engineers and three technicians of the medical engineering center have been trained at Australian Red Cross or other organizations and have the ability to repair X-ray apparatus, ultrasonic devices, anesthesia apparatus, and other types of medical equipment.

The possibility that the hospital will receive free repair services in the future will depend on the continuation of financial aid from international organizations and NGOs. However, even if the repair cost of medical equipment increases in the future, the hospital will be able to sustain itself financially as it is allowed to appropriate 50% of its remuneration collected from the patients to the maintenance of the equipment.

Additional electricity charges due to an increased number of medical instruments will be covered by the budget of the Ministry of Health. In the Kingdom of Cambodia, electric and other public utility charges for government organizations are paid by the Ministries supervising such organization. In the 1999 Budget of the Ministry of Health, 80,100,000 riel (about 2.4 million yen) is appropriated to electric charges in Siem Reap Province.

This Project also plans to procure one ambulance for Siem Reap Hospital and one transport vehicle to be lent to the health center located 60 kilometers away from the hospital. Fees are charged to the users of these vehicles except for the poor. Siem Reap Hospital charges 30,000 riel per dispatch, and the health center charges 30,000 to 40,000 riel per dispatch. Diesel fuel costs 1,000 riel per liter in the region. Based on the monthly mileage of a diesel car at 8 km/liter, the monthly fuel costs are calculated as follows:

Ambulance: 640 km/month
(Driving within the city 20 km x 30 times per month
+ round trip to airport 20 km x twice per month)
Fuel cost: 80,000 riel
Usage fees: 600,000 riel = 30,000 riel x 20 patients (excluding the poor)

Transfer vehicle: 4,200 km/month (round trip 120 km x 35 times per month)
Fuel cost: 525,000 riel
Usage fees: 700,000 riel = ave.35,000 riel x 20 patients (excluding the poor)

The fuel costs will be covered by usage fees collected from the patients. Spare parts and other costs will also be covered by the usage fees and remuneration. Daily inspection and simple repair work will be performed by the driver of these vehicles.

Chapter 4 Project Evaluation and Recommendation

4-1 Project Effect

1) Direct Effects

- By implementing this Project in Siem Reap Hospital, which is positioned as a referral hospital, secondary medical services for the residents of Siem Reap Province (population: 696,164) will be improved, as well as those for the residents of neighboring provinces, such as Otdar Mean Cheay (population: 68,279), Banteay Mean Cheay (population: 577,772) and Preah Vihear (population: 119,261) where referral hospitals are not fully in place.

- Medical services for landmine victims in Siem Reap Province and the neighboring provinces, Otdar Mean Cheay, Panteay Mean Cheay and Preah Vihear, will also be enhanced (the total of 267 landmine victims were registered in these three provinces between January and October 1999.).

2) Indirect Effects

- By upgrading the referral hospital that provides secondary care, the Project is expected to strengthen the Cambodian medical referral system under the medical system reform program implemented by the Royal Government of Cambodia.

- This Project will enable early diagnosis and treatment of landmine victims, thereby facilitating the rehabilitation of such victims.

4-2 Coordination with Technical Cooperation Projects and Other Donors

At present, no technical cooperation by Japan is being implemented in the hospital. The equipment to be procured through this Project will be utilized even more effectively in the future, if it is followed up by a technical cooperation project by the Government of Japan solely or in collaboration with international organizations and NGOs.

4-3 Recommendation

- Although most of the equipment articles are easy to maintain and supervise, periodic care is indispensable to the proper maintenance of medical equipment. It is necessary to remind the staff of Siem Reap Hospital the significance of maintenance on a daily basis, as well as the importance of keeping the facilities clean and hygienic.

- In Cambodia, training and education of engineers and technicians specialized in medical equipment maintenance is not adequately conducted. The skills of the maintenance staff of Siem Reap Hospital are also not necessarily at a satisfactory level. In order for the medical equipment to be fully utilized in the future, it is crucial that the maintenance capability of the hospital will be elevated.

- The hospital was opened ten years ago, and most of the buildings and facilities are becoming old. Although the initial request contained the construction of a new emergency ward and the procurement of medical equipment for landmine victims, it was decided that the Project would concentrate on the basic medical equipment of higher urgency.
  The current hospital buildings are not efficient because the wards are dotted in the hospital site, and some buildings are severely aged. However, as there are problems such as the reconstruction of the buildings, recruitment of medical staff and maintenance of the buildings and facilities, it is deemed that the direction of future cooperation should be considered after separate survey.

Annex 1 Member List of the Study Team

1. Team Leader: Ryugo Toji
   Grant Aid Division
   Economic Cooperation Bureau
   Ministry of Foreign Affairs

2. Planning Control: Rina Hirai
   Grant Aid Project Management Dept.
   Japan International Cooperation Agency

3. Study & Procurement Planning 1 (Equipment Plan): Akira Watanabe
   General Grant Aid Division
   Grant Aid Management Department
   Japan International Cooperation System

4. Study & Procurement Planning 2 (Procurement Plan): Chizuki Ohizumi
   General Affairs Dept.
   Japan International Cooperation System

Annex 2 Field Survey Schedule of the study on the project for improvement of medical equipment of the Siem Reap Hospital in the Kingdom of Cambodia

No.	Date	Day	Schedule		Lodging Location
			Group member	JICS member	
1	5 Dec	Sun		Narita 11:00 (JL717) – Bangkok 15:15	Bangkok
2	6 Dec	Mon		Study on local agents	Bangkok
3	7 Dec	Tue		Bangkok 08:35 (TG696) – Phnom Penh 09:05 Courtesy call to JICA Cambodia Office	Phnom Penh
4	8 Dec	Wed		Courtesy call to CDC, Courtesy call to and meeting with the Ministry of Health, Meeting with the National Mother & Child Health Center Phnom Penh 15:20(VJ360) – Siem Reap 16:00	Siem Reap
5	9 Dec	Thu		Study of the target hospital, Discussion	Siem Reap
6	10 Dec	Fri		Inspection visit to the Angkor Children's Hospital	Siem Reap
7	11 Dec	Sat	Narita 11:00 (JL717) – Bangkok 15:55	Study of the target hospital, Discussion	Bangkok/ Siem Reap
8	12 Dec	Sun	Bangkok 08:20 (TG696) – Phnom Penh 09:35 Phnom Penh 15:20 (VJ360) – Siem Reap 16:00	Collection and arrangement of materials	Siem Reap
9	13 Dec	Mon	Study of the target hospital, Discussion	Same as Group Member	Siem Reap
10	14 Dec	Tue	Study of the target hospital, Discussion Siem Reap 16:25 (VJ361) – Phnom Penh 17:05	Same as Group Member	Phnom Penh
11	15 Dec	Wed	Phnom Penh 08:35 (VJ432) – Battambang 09:20 Study of the target hospital, Discussion	Same as Group Member	Battambang
12	16 Dec	Thu	Battambang 08:20 (VJ431) – Phnom Penh 09:05 Discussion with the Health Ministry (Confirmation of the minutes)	Study of the target hospital, Discussion, Inspection visit to the Emergency Hospital	Phnom Penh/ Battambang
13	17 Dec	Fri	Signing for the minutes of discussions, Report to the Japanese Embassy, Report to JICA Office	Battambang 08:20 (VJ321) – Phnom Penh 09:50 Signing for the minutes of discussions, Report to the Japanese Embassy, Report to JICA Office	Phnom Penh
14	18 Dec	Sat	Phnom Penh 17:10 (TG699) – Bangkok 18:15 Bangkok 22:50 (JL718) -	Meeting with a transport company	Flight/ Phnom Penh
15	19 Dec	Sun	- Narita 06:20	Phnom Penh 15:20 (VJ360) – Siem Reap 16:00	Siem Reap
16	20 Dec	Mon		Study of the target hospital	Siem Reap
17	21 Dec	Tue		Study of the target hospital	Siem Reap
18	22 Dec	Wed		Siem Reap 07:15 (VJ321) – Phnom Penh 07:55 Meeting with the National Mother & Child Health Center, Study on local agents	Phnom Penh
19	23 Dec	Thu		Report to the Health Ministry, Meeting with the Cambodian Red Cross	Phnom Penh
20	24 Dec	Fri		Study on local agents, Report to the Japanese Embassy, Report to JICA Office	Phnom Penh
21	25 Dec	Sat		Study on local agents Phnom Penh 17:10 (TG699) – Bangkok 18:15 Bangkok 22:50 (JL718) -	Flight
22	26 Dec	Sun		- Narita 06:20	

ANNEX 3. List of party concerned in the Kingdom of Cambodia

1. the Cambodian Development Council

Ms. Heng Sokun	Deputy Director	Bilateral Aid Cooperation Dept., Japan-Asia Pacific-America

2. Ministry of Health

Dr. Man Bunheng	Secretary of State for Health	
Prof. Dr. Eng Hout	Director General for Health	
Ms. Or Oudam Roath	Pharmacist	Chief of Procurement Office
Ms. Sam Bolivy	Pharmacy Assistant	International Relation

3. Province of Siem Reap

3－1 Provincial Health Bureau

Mr. Oum Noeum	Vice Director	

3－2 Siem Reap Hospital

Mr. Chhay Tich	Hospital Director	
	Medical Assistant, Internal (Ultrasonic Examination)	
Dr. Eam Pun	Vice Director	
	Doctor	Surgery
Mr. Mol Neng	Vice Director	
	Medical Assistant	X-ray
Dr. Uy Borany	Doctor	Internal, ICU
Dr. Ith Savaon	Doctor	Gynecology & Obstetrics
Dr. Dy Sokhom	Doctor	Emergency room
Dr. Pen Phalkun	Doctor	Anesthetic
Dr. Ngi Sovanna	Doctor	Internal, (Gastroscope)
Dr. Kong Sunly	Doctor	Ophthalmic
Dr. Sreng Thea	Doctor	Dental
Mr. Sear Bun Leng	Dentist Assistant	Dental
Mr. Nap Setha	Physiotherapist	Physiotherapy
Ms. Chhay Kimchhorn	Pharmacist	Laboratory, Blood bank

3－3 Angkor Children's Hospital

Mr. Jon F. Morgan	Executive Director	
Mr. Roy Fenn	Administrative Director	
Ms. Meiko Sei Morgan	UNV Clinical Nurse Specialist	

4. Province of Battambang

4－1 Provincial Health Bureau

Mr. Thong Chharann	Vice Director	

4－2 Battambang Hospital

Mr. You Sang	Deputy Director	
Mr. Nhem Han	Deputy Director	
Dr. Som Hun	Physician	ICU
Dr. Kak Seila	Chief	Tuberculosis
Dr. Yi Knok	Chief	X-ray
Dr. Sar Yutay	Chief	Ultrasonic examination
Dr. Sieng Sokhieng	Chief	Dermatology
Dr. Sao Soeun	Head	Ophthalmic
Dr. Ngo Sitthy	Head	Otorhinolaryngology
Mr. Chhit Sophal, M.D.	Chief	Psychiatry
Mr. Ros Sareth	Chief	Laboratory
Mr. Chea Davuth	Chief	Pharmacy
Ms. York Sottha	Chief of Nurse	

4－3 Emergency Hospital (managed by Italian NGO)

Ms. Anna Marchesi	Coordinator	

ANNEX-4

MINUTES OF DISCUSSIONS
THE STUDY ON THE PROJECT FOR IMPROVEMENT OF MEDICAL EQUIPMENT OF THE SIAM REAP HOSPITAL IN THE KINGDOM OF CAMBODIA

In response to the request from the Government of the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a Study on the Project for Improvement of Medical Equipment of the Siam Reap Hospital (hereinafter referred to as "the Project") and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Cambodia the Study Team (hereinafter referred to as " the Team"), which is headed by Mr. Ryugo Toji, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, and is scheduled to stay in the country from December 7 to December 25, 1999.

The Team held discussions with the officials concerned of the Government of Cambodia and conducted a field survey.

In the course of discussions and field survey, both sides confirmed the main items described on the attached sheets.

Phnom Penh , December 17 , 1999

田路 龍吾

Mr. Ryugo Toji
Team Leader,
Study Team,
JICA

Dr. Mam Bunheng
Secretary of State for Health
Ministry of Health

ATTACHMENT

1. Objective

The objective of the Project is to improve the medical care services for land-mines victims as well as general injuries and diseases at the Siam Reap Hospital through procurement of necessary medical equipment.

2. Project Site

The Project site is the Siam Reap Hospital.

3. Responsible and Implementing Agency

(1) The Responsible Agency is the Ministry of Health.
(2) The Implementing Agency is the Siam Reap Hospital.

4. Items Requested by the Government of Cambodia

After discussions with the Team, the items described in Annex-1 were finally requested by the Cambodian side. However, items to be included in the Project will be decided after further study in Japan.

(Note: A = 1st Priority / Essential, B = 2nd Priority / Necessary)

5. Japan's Grant Aid System

(1) The Cambodian side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-2.
(2) The Cambodian side will take necessary measures, as described in Annex-3, for smooth implementation of the Project, as a condition for Japan's Grant Aid to be implemented.

6. Schedule of the Study

JICA will prepare a study report on the Project and send it to the Government of Cambodia around April, 2000.

7. Other relevant issues

(1)The Cambodian side shall allocate the necessary budget and personnel for implementation of the Project.
(2)The Cambodian side shall complete the preparation necessary for installation of new equipment before arriving of its equipment.

SEIM REAP HOSPITAL

Item No.	Equipment	Priority
1.Emergency Room(救急室)		
1－1	LARYNGOSCOPE	A
1－2	OXYGEN CYLINDER	A
1－3	CYLINDER TRUCK	A
1－4	OXYGEN EXTRACTER	A
1－5	OXYGEN FLOWMETER	A
1－6	ELECTRIC ASPIRATOR	A
1－7	AMBU BAG	A
1－8	ENDOTRACHEAL TUBE DIFFERENT SIZE	A
1－9	SPHYGNOMANOMETER, TABLE TOP TYPE	A
1－10	SPHYGNOMANOMETER, ANEROID TYPE	A
1－11	STETHOSCOPE	A
1－12	POTABLE VENTILATOR	A
1－13	2－CRANK STANDARD BED WITH MATTRESS & MOSQUITO NET	A
1－14	STANDARD GATCH BED WITH MATTRESS & MOSQUITO NET	A
1－15	STANDARD BED WITH MATTRESS & MOSQUITO NET	A
1－16	AIR CONDITIONER	A
1－17	AIR WAY	A
1－18	STAND FOR SOLUTION BOTTLES	A
1－19	HIGH AND LOW STRETCHER	A
2. I. C. U (集中治療室)		
2－1	FACE MASK	A
2－2	AIR WAY	A
2－3	POTABLE VENTILATOR	A
2－4	LARYNGOSCOPE	A
2－5	AMBU BAG	A
2－6	ENDOTRACHEAL TUBE DIFFERENT SIZE	A
2－7	STETHOSCOPE	A
2－8	2－CRANK STANDARD BED WITH MATTRESS & MOSQUITO NET	A
2－9	STANDARD BED WITH MATTRESS & MOSQUITO NET	A
2－10	STANDARD GATCH BED WITH MATTRESS & MOSQUITO NET	A
2－11	FOOT ASPIRATOR	A
2－12	ELECTRIC ASPIRATOR	A
2－13	STAND FOR SOLUTION BOTTLES	A
2－14	STANDARD WHEELCHIAR	A
3. Operation(手術室)		
3－1	OPERATING INSTRUMENT SET	A
3－2	ELECTROSURGICAL UNIT	A
3－3	OPERATION LIGHT	A
3－4	OPERATION TABLE	A
3－5	ELECTRIC ASPIRATOR	A
3－6	VENTILATOR	A
3－7	ENDOTRACHEAL TUBE DIFFERENT SIZE	A
3－8	ANESTHESIA APPARATUS WITH VENTILATOR	A
3－8	BREATHING TUBE SET	A
3－7	AIR WAY	A
3－8	REVOLVING CHAIR	A
3－9	STAND FOR SOLUTION BOTTLES	A
3－10	KICK BUCKET	A
3－11	LARYNGOSCOPE	A
3－12	AMBU BAG	A
3－13	MOBILE ROOM AIR STERILIZER WITH STAND	A
3－14	INSTRUMENT CABINET	A
3－15	SURGICAL SUTURE NEEDLE SET	A
3－16	HIGH AND LOW STRETCHER	A
4.Gyn. / Ob(産婦人科)		
4－1	DOPPLER FETAL HEARTDETECTOR	B
4－2	DELIVERY TABLE	A
4－3	AUTOCLAVE	A

Medical Equipment List

Item No.	Equipment	Priority
4－4	ELECTRIC ASPIRATOR	A
4－5	UTERINE CURETTE SET	A
4－6	CAESARIAN SET	A
4－7	TREATMENT LIGHT	A
4－8	STANDARD BED WITH MATTRESS & MOSQUITO NET	A
4－9	SPHYGNOMANOMETER, TABLE TOP TYPE	A
4－10	SPHYGNOMANOMETER, ANEROID TYPE	A
4－11	STETHOSCOPE	A
4－12	STAND FOR SOLUTION BOTTLES	A
5.X-ray(放射線部)		
5－1	MOBILE X-RAY UNITE	A
5－2	BASIC X-RAY SYSTEM	A
5－3	MANUAL PROCESSING SET	A
5－4	X-RAY FILM CASSETTE	A
5－5	X-RAY FILM DRYER	A
5－6	AIR CONDITIONER	A
5－7	ELECTRIC VENTILATER (WINDOW TYPE)	B
6.Laboratory(検査室)		
6－1	AUTOCLAVE VERTICAL 100L ELECTRIC WITH SOFT WATWER MACHINE	A
6－2	INCUBATOR(7－70TYPE)	A
6－3	INCUBATOR	A
6－4	AUTOCLAVE WITH SOFT WATER MACHINE	A
6－5	DRESSING DRUM	A
6－6	DRESSING CONTAINER	A
6－7	BINOCULAR MICROSCOPE	A
6－8	FREEZER FOR BLOOD BANK	A
6－9	SLIDE GLASS	A
6－10	COVER GLASS	A
6－11	GLASS WARE SET	A
6－12	DIGITAL MICRO PIPETTE SET	A
7.OPHTHALMIC(眼科)		
7－1	TOOL SET	A
8.Diagnostic(診断)		
8－1	GASTROSCOPE	B
9.Dental(歯科)		
9－1	ORL SURGICAL INSTRUMENT SET	A
9－2	DENTAL CHIR MOUNTED UNIT	A
10.Surgery Ward (外科病棟)		
10－1	STANDARD BED WITH MATTRESS & MOSQUITO NET	A
11.Office & Training Equipment (事務室, 訓練用備品)		
11－1	COMPUTER & PRINTER	A
11－2	COPY MACHINE	A
11－3	VIDEO RECORDER	A
11－4	OHP & SCREEN	A
11－5	VACUUM CLEANER	B
12.Ambulance Radio System (救急部)		
12－1	AMBULANCE	A
12－2	RADIOS FOR THE AMBULANCE AND FORMER DISTRICT HOSPITALS	A
13.Physiotherapy (リハビリテーション)		
13－1	ELECTRONIC TRACTION UNIT WITH A BED	A
13－2	MICROWAVE THERMY UNIT	B
13－3	AIR MASSAGER	A
13－4	BICYCLE EXERCISER	A
13－5	TRANSCUTANEOUS STIMULATOR	A
13－6	STANDARD WHEELCHAIR	A
14.Tuberculosis Ward (結核病棟)		
14－1	STANDARD BED WITH MATTRESS & MOSQUITO NET	A

Japan's Grant Aid Scheme

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereafter referred to as "the Study"), conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
d) Preparation of a basic design of the Project
e) Estimation of the costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid Project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations in the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry (ies) out the Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consulting firm(s) used for the Study which is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

1) What is Grant Aid ?

The Grant Aid Program provides a recipient country with non-reimbursable funds needed to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under the principals in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year in which the Cabinet approves the Project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When both Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or,

Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of recipient country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:
a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
b) To provide facilities of the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
c) To secure buildings prior to the procurement in case the installation of the equipment.
d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangements (B/A)

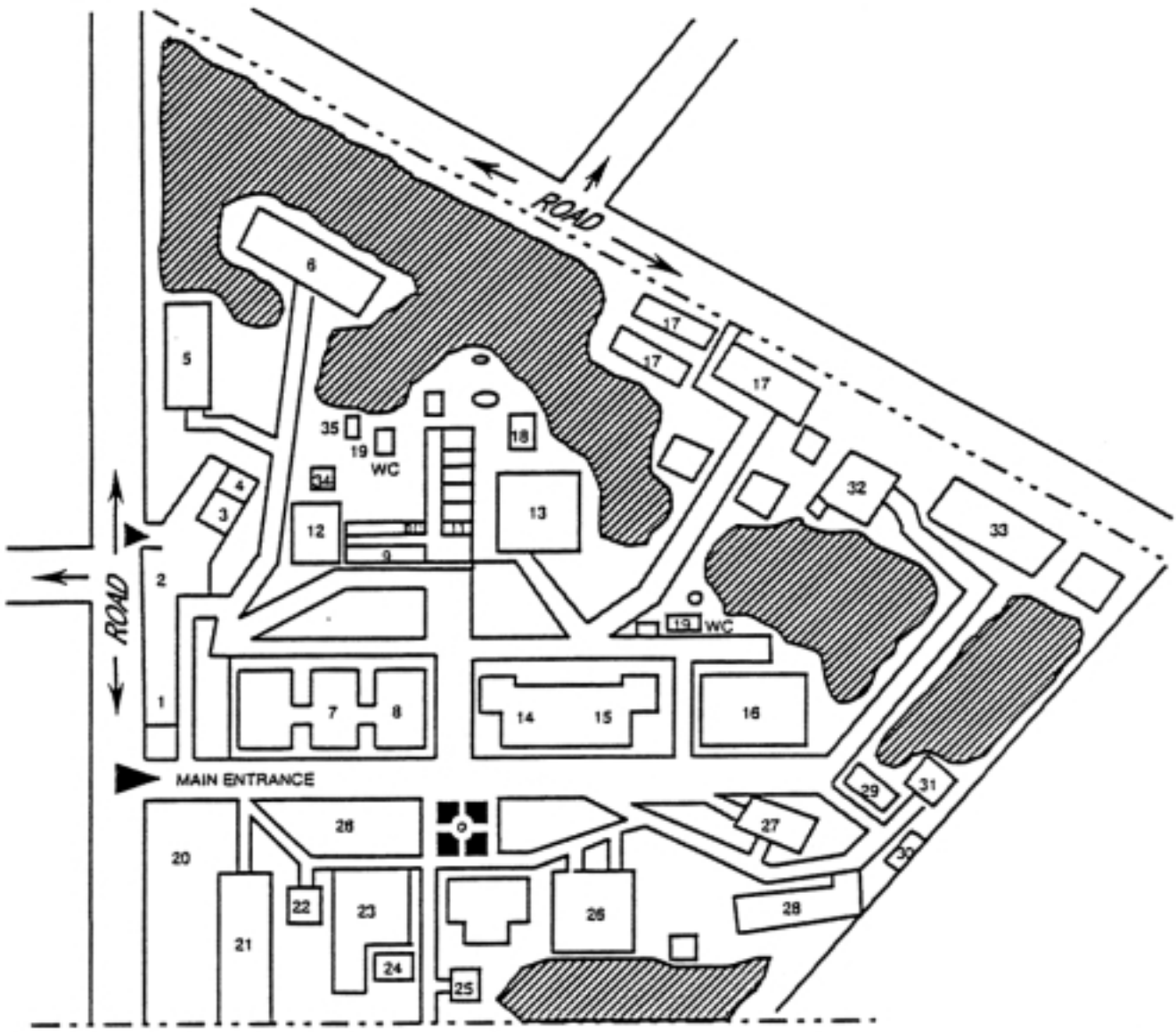
a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

Necessary Measures to be taken by the Cambodia side

Following necessary measures should be taken by the Cambodian side as a condition for the Japan's Grant Aid to be implemented:

1. To provide data and information necessary for the Project;
2. To bear commissions to a bank of Japan for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission;
3. To ensure prompt unloading, tax exemption, customs clearance before entering in Cambodia and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid;
4. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Cambodia with respect to the supply of the products and services under the verified contracts;
5. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into Cambodia and stay therein for the performance of their work;
6. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary;
7. To assign appropriate budget and staff for proper and effective use of equipment and instruments provided under the Grant Aid;
8. To maintain and use properly and effectively the equipment and instruments provided under the Project;and
9. To bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project.

Annex 5



1. DENTIST ROOM
2. EMERGENCY ROOM
3. MEETING ROOM
4. ADMINISTRATION
5. DEPARTMENT OF MONK
6. MALE MEDICAL WARD
7. GYNECOLOGY & DELIVERY UNITE
8. GYNECOLOGY & DELIVERY UNITE
9. OPERATION THEATRE
10. X-RAY ROOM
11. ULTRASOUND ROOM
12. GENERAL SURGERY
13. I.C.U SURGERY
14. SURGERY WARD
15. SURGERY WARD
16. —
17. T.B UNIT
18. WORK SHOP
19. W.C
20. PARKING
21. FEMALE MEDICAL WARD
22. PSYCHATRIC UNIT
23. EYE UNIT
24. WATER TOWER
25. MORGUE
26. INTENSIVE CARE UNITE
27. LABORATORY BLOOD UNIT
28. PHARMACY CHEMIST
29. GARAGE
30. STOCK
31. GRAGE
32. PHYSIOTHERAPY UNITE
33. HANDCAP INTERNATIONAL (NGO) UNITE
34. KITCHEN
35. TOILET