

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR MEDICAL EQUIPMENT PROVISION
FOR IMPROVING PUBLIC HEALTH CARE SERVICES
AT THE NATIONAL, MUNICIPAL
AND PROVINCIAL REFERRAL HOSPITALS
IN
THE KINGDOM OF CAMBODIA

MAY 2011

JAPAN INTERNATIONAL COOPERATION AGENCY

ITEM CONSULTING, INC.

MINISTRY OF HEALTH
KINGDOM OF CAMBODIA

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct a preparatory survey on the Project for Medical Equipment Provision for Improving Public Health Care Services at the National, Municipal and Provincial Referral Hospitals in the Kingdom of Cambodia, and entrusted the survey to INTEM Consulting, Inc.

The team conducted a preparatory survey from October 2010 to November 2011. The survey composed field investigations in the targeted sites, a series of discussions with the officials concerned of the Royal Government of Cambodia, and further studies in Japan. As a result of this survey, 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 the two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Royal Government of Cambodia for their close cooperation extended to the survey team.

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May, 2011

Nobuko Kayashima
Director General
Human Development Department
Japan International Cooperation Agency

S U M M A R Y

SUMMARY

I. Outline of the Country

(1) National land and Natural Condition

The Kingdom of Cambodia (called ‘Cambodia’ afterwards) is located in a little to the south of the Indochinese Peninsula and is bordered by Thailand to the northwest, Laos to the north and Vietnam to the southeast. The Mekong River flows from north to south through a little to the east of the central plain, in which the Lake Tonle Sap is situated a little to the west. Cambodia has the land area of approx. 181,000 square kilometers (about a half of the land area of Japan) and has the population of approx. 13.40 million¹. Cambodia has reorganized its administrative divisions in December, 2008 and has 24 first-level administrative divisions (23 provinces and the capital of Phnom Penh). The targeted area of the Project is 16 provinces and the capital of Phnom Penh.

Cambodia belongs to the tropical monsoon climate. The dry season is from November to April and the rainy season is from May to October. The annual average temperature is approx. 28°C. The month which has the lowest monthly average temperature 25°C is January and the month which has the maximum average temperature 29-35°C is March to April. The annual average humidity is 77% and the highest monthly average humidity is 84% in September. No earthquake has been occurred in Cambodia in the past and no special typhoon and/or tornado has also been occurred. The average amount of annual rainfall is approx. 1,300mm to 1,400mm. In rainy season, it comes to approx. 250 to 260mm in monthly average at the highest in September and October. In some targeted hospitals, some buildings have been flooded after heavy rain. However, the height from the ground to the floor is large in traditional houses, therefore, no damage has been recorded. Thus, there is no important notice in terms of natural conditions in the sites.

(2) Socio-Economic Conditions

For the economy in Cambodia, GNI is 94 billion US dollars, GNI per capita is 610 US dollars, economic growth rate is minus 1.87 percent and inflation rate is 5.1 percent. Cambodia recorded economic growth rate of approx. 9.1% in average from 1998 to 2008. However, economic growth rate turned to minus because of the decline of the growth of sewing product export, sightseeing revenue and construction which occupies approx. 30% of GDP in relation with the global recession occurred after “Lehman Shock” in September 2008. The major cause was the decrease of 20% of sewing product export for USA which covered 70% of total sewing product export. However, according to ADB, approx. 4.5% of economic growth is expected

¹ National Institute of Statistics of Cambodia; Population census(2008)

owing to the recovery of global economic in 2010. Cambodia ranks 124th of 169 countries in Human Development Index. Though Cambodia has risen higher than the category of 'Low human development', Cambodia ranks the fourth lowest among the category of 'Medium human development' and still has a lot of challenges to be developed. Industry Breakdown of GDP accounted for 32.5% of the primary industry, 22.4% of the secondary industry and 45.1% in the tertiary industry. The main industry is agriculture. By the decade of the civil strife, Cambodia's economy got the devastating damage. Since 1991, with the support of western countries, social infrastructure and market economy have been developed and GDP had been rapidly grown. After 1998, Cambodia's macro economy has been stable. Cambodian government promotes trade and investment and is seeking to promote economic growth under the recognition that further promotion of economic growth is essential to realize poverty reduction.

II. Background of the Project

(1) Overarching Mission

"National Strategic Development Plan 2006-2010" (NSDP) planned in 2005 has been extended to 2013. NSDP is promoting cooperation with development partners for getting an assistance and using internal resources in terms of poverty reduction, the extraction of the prioritized matters and the solving the matters for the accomplishment of CMDGs² and social economic growth under the rectangular strategy³. Regarding the health sector, there is still room for improvement in terms of health indicators and CMDGs. The improvement of accessibility to health service, especially, sustainable support to poverty group shall be implemented by the construction and/or improvement of health facilities such as hospitals and health centers.

In "Second Health Strategic Plan 2008-2015" (HSP2), having the objectives of the improvement of accessibility of health service and the prevention of diseases, especially, targeting women, children and poor population, Cambodia is struggling to improve the Cambodian people's health. For strengthening of provision of health services, the guideline for health centers (MPA: Minimum Packages of Activity) and the guideline for hospitals (CPA: Complimentary Packages of Activity) have been made. The standard equipment list for each health facility has also been set so as to provide medical equipment and relevant infrastructure along with the list.

² CMDGs : Cambodia Millennium Development Goals

³ Rectangular Strategy: It sets out the Government's intention to build Cambodian society by strengthening peace, stability and social order, promoting sustainable and equitable development, and entrenching democracy and respect for human rights and dignity. The four growth components of the Rectangular Strategy are (i) agricultural development, (ii) infrastructure rehabilitation and development, (ii) private sector development and employment creation, and (iv) capacity building and human resource development.

Furthermore, in “Second Health Sector Support Program 2009-2013”(HSSP2) which is planned for assisting the implementation of HSP2, especially in financial aspect, a pool fund has been established and UNFPA/UNICEF, IDA/WB, DFID and AusAID are financing to the fund. AFD, BTC and UNICEF/UNFPA are also financing to health sector through HSSP2 individually.

(2) Circumstance and Issues on Relevant Sector

Health Sector Indicators of Cambodia has been much improved since the end of the civil war by financial and technical cooperation of donors including Japan in health sector. For example, infant mortality rate and under 5 years mortality rate in 2007 have been improved approx. 20% compared with 2000⁴. However, health sector indicators still remain on a low level and Cambodia is ranked lowest among Indochinese peninsula countries as follows (As of year 2008): Life Expectancy at Birth ; 59 Infant Mortality Rate ; 70 of 1,000, Under 5 years Mortality Rate ; 91 of 1,000. Cambodia is still has many difficulties in Health Sector.

MOH has been struggling for the improvement of the quality of health services as one of the strategies in health sector. MOH has been improving medical equipment based on the standard equipment list by each provincial referral level. However, medical equipment for providing basic health services has not yet been equipped even in the National Hospitals (NHs) and the tertiary referral hospitals (RHs) in provinces.

(3) Objective of the Project

The Project will furnish the fund, to provide medical equipment for improving health services in the NHs and CPA3 RHs, for procuring medical equipment (General X-ray machine, Ultrasound machine and Patient monitor) to 4 of NHs and 17 of CPA3 RHs.

Besides, JICA is now implementing “The project for strengthening medical equipment at referral hospitals (MEDEM2)” from 2009 for training personnel for management of medical equipment. The equipment procured in the Project is included in the standard medical equipment list of the guideline for CPA RHs which is targeted in MEDEM2 project. Therefore, the output of MEDEM2 project is expected to feed back to each hospital targeted in the Project in terms of the management of medical equipment after the completion of the Project.

⁴ Unicef, “The State of the World Children”(2010)

III. Outline of Survey Result and Contents of the Project

Having the request from Cambodia, Japanese Government decided to conduct the preparatory survey on the Project. Japan International Cooperation Agency (JICA) organized a survey team for outline design between on October 31 to November 27, 2010. Subsequently, in Japan, the survey team analyzed documents and information collected during the survey and prepared the draft of preparatory survey report. The survey team visited Cambodia again between on February 13 to 19, 2011 and explained the contents of the draft of the report.

The Project is to furnish the fund, to provide basic and essential medical equipment of clinical and monitoring use for improving health services in 4 of the NHs and 17 of CPA3 RHs. Having the result of the field survey and the discussions with Cambodian side, the followings are to be planned;

(1) Design Policy

1) Scope of Works

Scope of Works has been decided in accordance with the following basic policies.

- a) Targeted facilities shall be all hospitals listed in the application form.
- b) Planned equipment shall be General X-ray machine, Ultrasound machine, Patient monitor and the related items listed in the application form.
- c) Equipment plan shall be consistent with the actual situation of the targeted hospitals.

The main situations to be confirmed were as follows;

- ① if there are human resources who can handle the equipment requested
 - ② if there is a duplication to the existing equipment and/or the assistance from other donors
 - ③ the necessity of the equipment requested
 - ④ Utilities in rooms in which the requested equipment to be installed (if there is an outlet in an intended rooms, etc.)
- d) Equipment plan shall be in accordance with the guideline of medical equipment for hospitals decided by MOH.
 - e) Equipment plan shall be consistent with the activities and the capacity of the targeted hospitals.

2) Basic Plan

Planned equipment shall be selected according to the following criteria.

Planned equipment shall ;

- a) be matched with the technical level of doctors at the targeted hospitals

b) not be advanced ones in terms of operation and maintenance at the targeted hospitals
 c) be matched with the situations of infrastructure of the targeted hospitals. The items to be confirmed are as follows;

- Conditions of electricity (power cut, protection for voltage fluctuation, etc.)
- Situations of the protection from radiation

d) be appropriate ones in terms of the procurement of consumable and maintenance

(2) Contents of the Project

The planned equipment and the quantity are as follows.

No.	Description	Q'ty	Purpose of Use
1-1	General X-ray (Smaller Capacity Type)	13	Diagnosis of TB, Fracture and etc.
1-2	General X-ray (Larger Capacity Type)	1	Diagnosis of TB, Fracture and etc.
1-3	Automatic Film Processor	19	For X-ray film developing
1-4	X-ray Protection Box (Type1)	6	X-ray protection in a X-ray room
1-5	X-ray Protection Box (Type2)	3	X-ray protection in a X-ray room
1-6	X-ray Protection Box (Type3)	1	X-ray protection in a X-ray room
1-7	X-ray Protection Box (Type 4)	1	X-ray protection in a X-ray room
1-8	X-ray Protective Set	19	For protection of radiation in X-ray shooting
2-1	Ultrasound Machine for Cardiac and General Exam	4	Ultrasound diagnosis for cardiology and abdominal Disease
2-2	Ultrasound Machine for General Exam	6	Ultrasound diagnosis for abdominal Disease
2-3	Ultrasound Machine for OBGY	6	Ultrasound diagnosis for OBGY
3-1	Patient Monitor	39	Monitoring biological signals of patients

IV. Project Schedule and Estimated Project Cost

The cost to be borne by Cambodian side for implementing this project under Japan's Grant Aid System is estimated 0.1 million yen. The project is scheduled to be implemented in a single fiscal year, taking 3 months for detailed design, 8 months for procurement and 2 months for Soft Component.

V. Evaluation of the Project

The Project is approved to be relevant within a scope of Japanese grant aid scheme in the following aspects;

(1) The relevance of the Project

1) Beneficiary targeted by the Project

The targeted areas of the Project are 16 provinces and 1 municipal and the direct beneficiaries are amounted to be 11 million⁵, approximately 80% of the total general nation's population in Cambodia (As of 2008). Therefore, the relevance is confirmed.

2) View of human security

The project purpose is “to improve the quality of healthcare services by providing medical equipment at the targeted NHs and CPA3 RHs”. Implementing this project would contribute to reduce the threat of 80 % of nation in Cambodia through improving the quality of healthcare services. The concept of human security places individual human beings at its core, seeking to defend them from fear and want: fear of things like conflict, terrorism, disaster, environmental destruction, and infectious disease, and want in the face of poverty and in social services and infrastructure. By building up people's abilities to address these issues themselves, this approach aims to build societies in which they can live with dignity.

From the point of view, the Project conforms the concept of human security and it is expected to lead nation to better living.

3) Technical level

The general-purposed equipment which is not required excessive advanced technique is planned in the Project and each hospital has already experienced to use it. Besides, the operation and maintenance of the equipment will be possible to be done in the range of own budget and system at hospital.

4) Contribution to mid-term and long-term development plan in the recipient country

A mission of the HSP2 is to improve the people's health status by improving the accessibility to basic health services and prevent disease especially for targeting women, children and poverty group. Improving medical equipment by the Project would indirectly contribute to better access of health service. On that point, this project is

⁵ The number of targeted beneficiary was referred the data of Population census(2008) by National Institute of Statistics of Cambodia.

approved to be significant means for achieving national mission, and the relevance of the project is fully confirmed.

5) Profitability

This project does not demand high profitability as it targets public NHs and provincial RHs. However, it is necessary to secure adequate operation cost for maintaining equipment appropriately. The project is expected to indirectly contribute to increasing income from the patient fee of treatment and examination and it would help sustainability of the Project.

6) Impact on environmental and social aspects

X-ray protection is not fully furnished at a number of targeted hospitals. In case the hospitals procuring general X-ray machine by the Project, X-ray protection will be included to the plan as the associated environment-friendly equipment.

7) Appropriateness under grant aid scheme

The project is within the appropriate scope of Japanese grant aid taking consideration of the implementing agency's system; capability, human resources, budgetary plan and master plan into consideration.

8) Necessity and superiority of Japanese technique

Japan has been continuously supporting Cambodian restoration and reconstruction. Improvement of health sector is considered to be the top priority of the national strategy in Cambodia, so offering continuous assistance and contributing to improving quality of health care services would show steady presence to Cambodia as one of the leading donors.

Japanese medical manufacturers are proud of their high technical level in producing productions such as X-ray machine, ultrasound machine and patient monitor and its high quality is appreciated in all over the world. Therefore, this project can prove the effectiveness of Japan's assistance.

(2) Assessment of the effectiveness of the Project

1) Quantitative Effect

- a) 29 %, the ratio of CPA3 RHs equipped fixed General X-ray against the standard number set by MOH becomes 100% by the Project.
- b) 76%, the ratio of CPA3 RHs equipped Ultrasound Machine against the standard number

set by MOH becomes 100% by the Project.

- c) 29%, the ratio of CPA3RHs equipped Patient Monitor against the standard number set by MOH becomes 100% by the Project.
- d) Among the hospitals planned to be equipped General X-ray machine, the number of hospitals furnished X-ray protection properly increases from 3 to 14.
- e) The number of the X-ray examination increases by 5% or more
- f) The number of the X-ray examination increases by 20% or more

2) Qualitative Effect

- ① To implement appropriate diagnosis and treatment to the patients in the targeted area and performing suitable care for the patients in serious condition
- ② To improve medical security by furnishing X-ray protect box to the hospitals lacking protecting facility
- ③ To contribute to improve the function of the referral system such that targeted hospital can accept the patients who used to be transferred to another hospitals.

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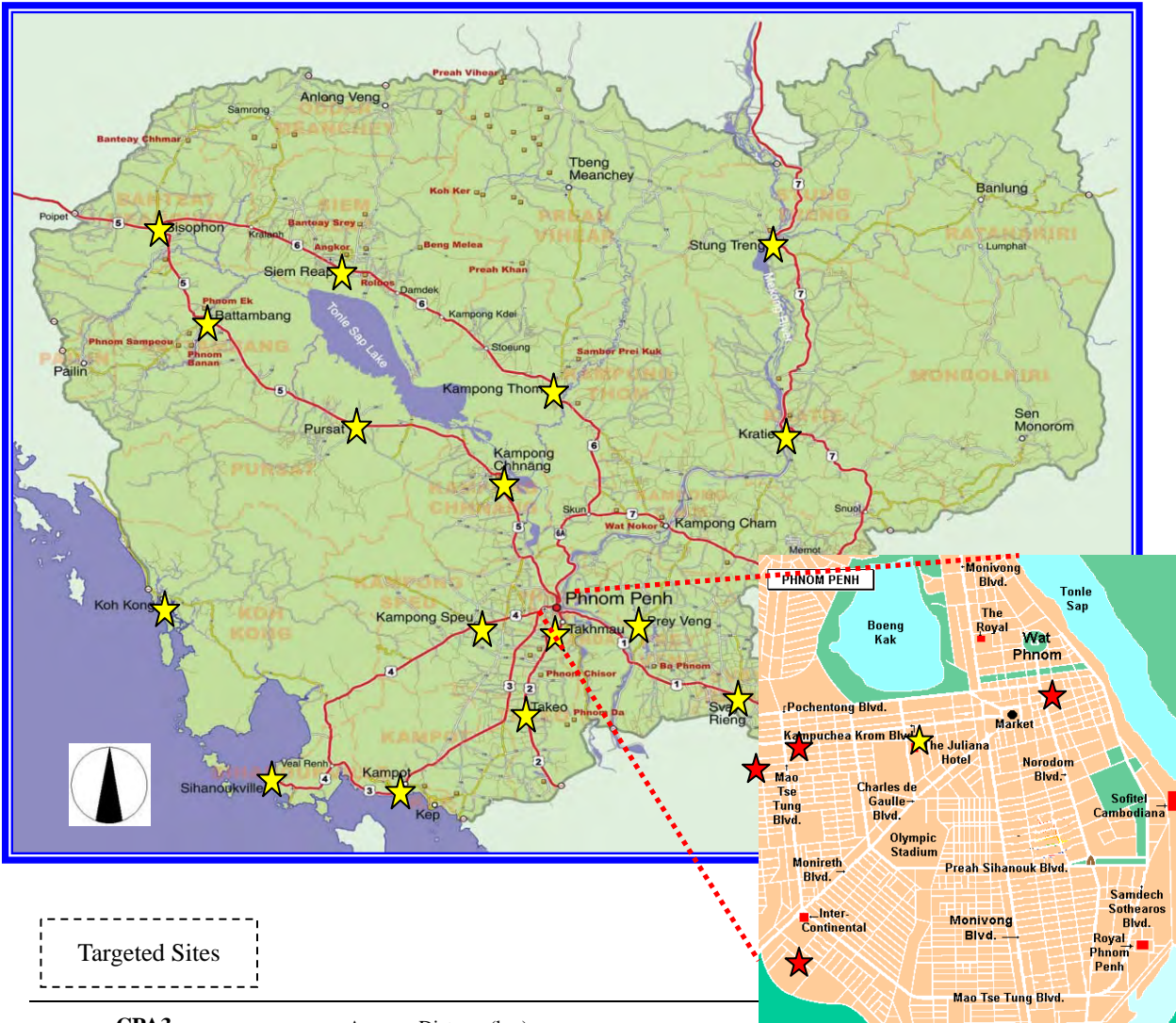
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Location Map



Targeted Sites

★	CPA3 Referral Hospitals	Approx. Distance(km) From Phnom Pehn			Approx. Distance(km)
1.	Kampot	184	12.	Takeo	97
2.	Kampong Chhnang	91	13.	Prey Veng	90
3.	Kampong Thom	168	14.	Svay Rieng	122
4.	Siem Reap	315	15.	Sihanouk Ville	250
5.	Battambang	391	16.	Pursat	187
6.	Mongkol Borey	350	17.	Phnom Penh Municipal	-
7.	Stung Treng	455	★	National Hospitals	
8.	Kampong Speu	50	18.	K.S. Friendship	-
9.	Kratie	315	19.	Preah Ang Duong	-
10.	Koh Kong	300	20.	Preah Kossamak	-
11.	Kandal	20	21.	National Pediatric	-

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Abbreviations

ADB	Asian Development Bank
AFD	Agence Française de Développement
AIDS	Acquired Immune Deficiency Syndrome
AOP	Annual Operation Plan
A/P	Authority to Pay
AusAID	Australian Agency for International Development
BA	Banking Arrangement
BTC	Belgian Technical Cooperation
CMDGs	Cambodia Millennium Development Goals
CMS	Central Medical Stores
CPA	Complementary Package of Activity
DAC	Development Assistance Committee
DFID	Department for International Development
DOTS	Directly Observed Treatment, Short Course
EDC	Electricite du Cambodge's
E/N	Exchange of Notes
FOB	Free on Board
G/A	Grant Agreement
GDP	Gross Domestic Product
GE	General Electric Company
GNI	Gross National Income
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HC	Health Center
HEF	Health Equity Funds
HIV	Human Immunodeficiency Virus
HSP	Health Sector Strategic Plan
HSP2	Second Health Strategic Plan
HSSC	Health Sector Steering Committee
HSSP	Health Sector Support Project
HSSP2	Second Health Sector Support Project
ICU	Intensive Care Unit
IDA	International Development Association
JICA	Japan International Cooperation Agency
KHR	Khmer Riel

K. S. Friendship NH	Khmer Soviet Friendship National Hospital
KOICA	Korea International Cooperation Agency
LDC	Least Developed Countries
ME	Medical Equipment
MEDEM	The Project on Strengthening of Medical Equipment Management in Referral Hospitals
MEF	Ministry of Economy and Finance
MOH	Ministry of Health
MPA	Minimum Package of Activity
NGO	Nongovernmental Organization
NMCHC	National Maternal and Child Health Center
NSDP	National Strategic Development Plan
NWT	National Workshop Team
OD	Operational District
PHD	Provincial Health Department
P.P.	Phnom Penh
PRH	Provincial Referral Hospital
RH	Referral Hospital
RTC	Regional Training Center
SDG	Service Delivery Grants
TSMC	Technical School of Medical Care
TWG	Technical Working Group
UNFPA	UN Population Fund
UNICEF	United Nations Children' s Fund
UPS	uninterruptible power equipment
USAID	U.S.Agency for International Development
WB	World Bank
WHO	World Health Organization

CHAPTER 1: BACKGROUND OF THE PROJECT

Chapter 1 BACKGROUND OF THE PROJECT

1-1 Background of the Project

Ministry of Health (hereinafter called MOH) has been struggling for the improvement of the quality of health services as one of the strategies of health sector in “Health Sector Strategic Plan 2008-2015” (HSP2). MOH has been improving medical equipment in accordance with the standard equipment list by each provincial referral level. However, medical equipment for providing basic health services has not yet been equipped even in the NHs and the tertiary referral hospitals in provinces.

Having the situation above, the procurement of medical equipment for 4 of National Hospitals (hereinafter called NH) and 17 of provincial CPA3 referral hospitals (hereinafter called RH) for the improvement of the quality of health services have been requested to Japanese Government to be a grant aid project.

This preparatory survey’s objective is to confirm the necessity and the validity of cooperation, to conduct proper outline design as a grant aid project and to formulate the detailed contents and the cost of the Project.

The outline of the original application form of the Project is as follows;

(1) Requested Equipment

- | | |
|-------------------------|-----------|
| ① General X-ray machine | : 38 sets |
| ② Patient monitor | : 75 sets |
| ③ Ultrasound machine | : 31 sets |

(2) Targeted Facilities and the Allocation of Equipment

The targeted facilities are 21 hospitals (4 of NHs and 17 of provincial CPA3 RHs).

List of the targeted hospitals and requested equipment is shown below.

Table 1-1 Requested Equipment and Targeted Hospitals

S.No.	Distinction	Hospitals	Quantity		
			X-ray machine	Ultrasound Machine	Patient Monitor
1	CPA3 RHs	Kampt	1	5	1
2		Kampong Chhnang	2	5	2
3		Kampong Thom	2	3	1
4		Siem Reap	2	3	1
5		Battambang	2	5	2
6		Mongkol Borey	1	2	1
7		Stung Treng	2	5	2
8		Kampong Speu	2	5	2
9		Kratie	2	3	2
10		Koh Kong	2	1	1
11		Kandal	2	2	-
12		Takeo	2	4	2
13		Prey Veng	2	5	1
14		Svay Rieng	2	4	1
15		Sihanouk Ville	2	3	1
16		Pursat	2	4	2
17		PP. Municipal	2	3	2
18	NHs	K.S. Friendship	2	5	2
19		Preah An Duong	-	3	1
20		Preah Kossamak	2	5	2
21		National Pediatric	2	-	2
Total			38	70 (75 ⁶)	31

1-2 Natural Conditions

Cambodia belongs to the tropical monsoon climate. The dry season is from November to April and the rainy season is from May to October. The annual average temperature is approx. 28°C. The month which has the lowest monthly average temperature 25°C is January and the month which has the maximum average temperature 29-35°C is March to April. The annual average humidity is 77% and the highest monthly average humidity is 84% in September.

No earthquake has been occurred in Cambodia in the past and no special typhoon and/or tornado has also been occurred. The average amount of annual rainfall is approx. 1,300mm to 1,400mm. In rainy season, it comes to approx. 250 to 260mm in monthly average at the highest in September and October. No major difference in weather condition is recognized by each area

⁶ The listed number was 70 sets in the requesting form. However, the total quantity is 75 sets as it is shown here. We confirmed that the number 70 should be modified.

in Cambodia.

1-3 Environmental and Social Considerations

As the objective of the Project is to provide medical equipment in hospitals for updating the existing equipment, no negative environmental and social impact will be basically occurred. Meanwhile, X-ray protection is not enough in X-ray rooms in almost all of the targeted hospitals. Therefore, General X-ray machine is installed in a pre-fabricated X-ray protection box for the X-ray rooms of the targeted hospitals in which X-ray protection is not sufficient.

CHAPTER 2: CONTENTS OF THE PROJECT

Chapter 2 CONTENTS OF THE PROJECT

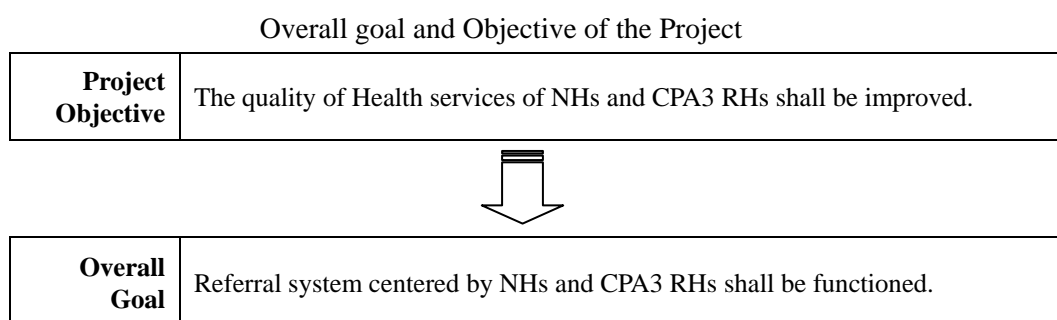
2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Purpose

Health Sector Indicators of Cambodia has been much improved since the end of the civil war with financial and technical cooperation of donors, including Japan, in health sector. For example, infant mortality rate and under 5 year mortality rate in 2008 have been improved approx. 15% compared with 2000 (UNDP: 2010). However, health sector indicators still remain on a low level and Cambodia is ranked lowest among Indochinese peninsula countries. Cambodia is still has many difficulties in Health Sector.

To overcome such challenges, Cambodia has planned “Second Health Strategic Plan 2008-2015” (HSP2). A mission of HSP2 is to improve the people’s health status by improving the accessibility to basic health services and to prevent diseases especially for targeting women and poverty group. To put it concretely, HSP2 aims at providing appropriate medical equipment along with the standard equipment list decided in the guideline for the Complimentary Packages of Activity (CPA) at hospitals and the guideline for Minimum Packages of Activity (MPA) at health facilities and relevant infrastructures for strengthening healthcare services which is the one of strategies of HSP2.

The purpose of the project is to improve the quality of health services and the accessibility by providing prioritized medical equipment included in the guideline for CPA RHs to the targeted top referral hospitals. The enhancement of the function of referral system shall also be targeted as a long term objective.



2-1-2 Basic Concept of the Project

This project will furnish the fund, to provide medical equipment for improving healthcare services in National and CPA3 RHs, for procuring medical equipment (General X-ray machine, Ultrasound machine and Patient monitor) to 4 of the NHs and 17 of Provincial RHs.

Besides, JICA is now implementing “The project for strengthening medical equipment at referral hospitals (MEDEM2)” from 2009 for training personnel for management of medical

equipment. The equipment procured by the Project is included in the standard medical equipment list of the guideline for CPA RHs which is targeted in MEDEM2 project. Therefore, the output of MEDEM2 project is expected to feed back to each hospital targeted in the Project in terms of the management of medical equipment after the completion of the Project.

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

In this project, a system of medical service will be improved in the targeted hospitals of the Project to provide fundamental and high prioritized medical equipment for NHs and provincial CPA3 RHs which are the core of health services in Cambodia. The targeted NHs and CPA3 RHs are as follows:

Targeted Hospitals	
[CPA3 RHs]	
(1)	Kampot
(2)	Kampong Chhnang
(3)	Kampong Thom
(4)	Siem Reap
(5)	Battambang
(6)	Mongkol Borey
(7)	Stung Treng
(8)	Kampong Speu
(9)	Kratie
(10)	Koh Kong
(11)	Kandal
(12)	Takeo
(13)	Prey Veng
(14)	Svay Rieng
(15)	Sihanouk Ville
(16)	Pursat
(17)	P.P. Municipal
[NHs]	
(18)	K.S. Friendship
(19)	Preah Ang Duong
(20)	Preah Kossamak
(21)	National Pediatric

The design policy of the Project is mentioned below with the objectives.

(1) Basic Policy

1) Defining Scope and Scale of the assistance

Scope and scale of the assistance were defined in accordance with the following basic policies:

- ① Targeted facilities shall be all hospitals shown in the application form.
- ② Planned equipment shall be General X-ray machine, Ultrasound machine, Patient monitor and the related items shown in the application form.
- ③ Equipment plan shall be consistent with the actual situation of the targeted hospitals.
The items to be confirmed are as follows;
 - if there are human resources who can handle the equipment requested
 - if there is a duplication to the existing equipment and/or the assistance from other donors
 - the necessity of the equipment requested
 - Utilities in rooms in which the requested equipment to be installed (if there is an outlet in rooms, etc.)
- ④ Equipment plan shall be in accordance with the guideline of medical equipment for hospitals decided by MOH.
- ⑤ Equipment plan shall be consistent with the activities and the capacity of the targeted hospitals.

2) Basic Policy for Equipment Selection

Planned equipment shall be selected according to the following criteria.

Planned equipment shall ;

- ① be matched with the technical level of staffs (doctors, nurses and others) of the targeted hospitals.
- ② not be advanced ones in terms of operation and maintenance at the targeted hospitals.
- ③ be matched with the situations of infrastructure of the targeted hospitals. The followings are confirmed;
 - Conditions of electricity (power cut, protection for voltage fluctuation, etc.)
 - Situations of the protection from radiation
- ④ be appropriate ones in terms of the procurement of consumable and maintenance

(2) Policy for Natural Conditions

There is only ceiling fan in most of the examination rooms and/or wards at hospitals targeted in the project. There are very few air conditioners in the hospitals. In the Project, in case that General X-ray machine is provided to the room where X-ray protection is not furnished, X-ray protection box shall be provided to the room so as not to expose X-ray technicians and other persons when X-ray examination is conducted. However, when standard 5-sided protection box except floor is procured, the high temperature and humidity in the box might give negative affection to X-ray machine's life time. Therefore,

some ceiling specifications of the box could be modified and natural ventilation could be considered.

In some targeted hospitals, some compounds have been flooded after heavy rain. However, the height from the ground to the floor is large in traditional houses, therefore, no damage has been recorded. Thus, there is no important notice in terms of natural conditions in the sites.

(3) Policy for Social and Economic Conditions

As of the end of 2007, 85% of electric power supply of Cambodia is purchased from private IPP (Independent Power Provider). EDC supplies only 13% of whole electric supply by their own electric power plants and the remaining portion is imported from Thailand and Vietnam. The national average of electric fee is 15 cents/kWH and this is rather higher compared with neighboring countries such as 7 cents/kWH in Thailand, 5 cents/kWH in Vietnam and 6 cents/kWH in Laos⁷. The X-ray tube output of fixed type X-ray machine procured in the Project is higher than the existing ones (most of existing ones are mobile X-ray machines). Hence, it is anticipated that the power consumption of each hospital could be increased. Therefore, the equipment which has excessively high-functioned specifications shall be avoided. By selecting relatively compact equipment, the running cost of each hospital could not be much burdened.

In Cambodia, an electrical power cut happens frequently and voltage fluctuation is also high in some areas. Therefore, AVR (Auto Voltage Regulator) and/or UPS (Uninterrupted Power Supply) is attached to medical equipment which will be affected by unstable status of electricity.

(4) Policy for Equipment Procurement Conditions

General X-ray machine, Ultrasound machine, Patient monitor and the related items are included in the Project as planned equipment. In the planned equipment, a product of Cambodia is not included. All equipment shall be procured from Japan. Prospective manufacturers of all planned equipment have an agent in Cambodia and also have engineers who can provide aftersales service. Those agents will be able to have a contract with targeted hospitals on maintenance.

(5) Policy for Local Contractors

Input by Japan side for the Project is the procurement of medical equipment and renovation works such as furnishing X-ray protection by a local contractor are not included.

⁷ JETRO daily commerce/April, 2008

Installation and Operational Training of the medical equipment shall be conducted by the engineers dispatched from manufacturers in Japan and/or the engineers dispatched from local agents of manufacturers. Regarding procurement supervision, local consultant shall not be hired for the project because there is no consultant acquainted with Japan's grant-aid scheme.

(6) Policy for Operation and Maintenance Capability

The budget of 21 hospitals targeted in the Project consists of 2 main sources such as the one which allocated from MOH and the other one which paid by users (patients). As the most of the budget allocated from MOH is for purchasing pharmacy, there are few amounts which could use for the maintenance of medical equipment. In some hospitals, a part of user fee is used for the maintenance fee of medical equipment. However, actually, the maintenance fee is not enough in general.

The component of the Project consists of the replacement of the existing equipment and the addition of new equipment. As the General X-ray machine is the replacement of the existing equipment only, unless the number of shooting increases too much, the cost for film and developer would not greatly increase. Regarding ultrasound machine and patient monitor, the specifications shall be cost effective ones such as with a general printer instead of with an exclusive printer which needs special printing paper.

As mentioned before, the 21 hospitals targeted in the Project have the existing X-ray machine, ultrasound machine and patient monitor which are used for examination and diagnosis every day. Therefore, the minimum staffs who can handle basic operation and maintenance of the equipment have already been assigned in each hospital. However, the kind of the equipment procured in the Project will differ from the existing one, and the function of the procured equipment will have higher function compared with the existing mobile X-ray machine and portable ultrasound machine. It will be meaningful to have proper training on usage and maintenance of the equipment at the introduction of the equipment from engineer of manufacturer in terms of the extension of life time of the equipment and effective use. Thus, operational training shall be incorporated in the Project together with instruction for operation and maintenance.

(7) Policy for Selection of Levels of Equipment

The grade for the medical equipment procured in the Project is as follows;

1) General X-ray machine and ancillary equipment

In the provincial hospitals, considering the situation of power supply and the size of the room for the equipment to be installed, a compact type of 20kVA General X-ray machine is

planned. Basic components of the compact type General X-ray machine are main body, Bucky table and Bucky stand. For Khmer Soviet Friendship Hospital, a large type General X-ray machine, which has the specifications of more than 50kVA, shall be planned because of the frequency of use and rather big capacity of power supply inside the hospital. Basic components of the large type General X-ray machine are main body, X-ray generator, X-ray tube, X-ray tube support (floor running type), Bucky table and Bucky stand. Ancillary equipment consists of auto exposure system, automatic developer, X-ray protection accessory set for all the hospitals procuring General X-ray machine. For the hospitals which have no X-ray protection in the X-ray room, X-ray protection box shall be planned.

2) Ultrasound machine

Specifications shall be standard ones with a cart. For all types of ultrasound machines, UPS (Uninterrupted Power Supply) with AVR (Auto Voltage Regulator) function shall be included as a component. Kinds of probes to be supplied are as follows;

- i) Ultrasound machine for cardiovascular examination: Sector, Convex, Linear
- ii) Ultrasound machine for general use: Convex, Linear
- iii) Ultrasound machine for obstetrical and gynecology: Convex

3) Patient monitor

The specifications for patient monitor shall be basic model of 4 lines. For parameters, the monitor shall have ECG, heart beats rate, breathing rate, SpO₂, temperature and NIBP. For the probe of measuring SpO₂ and the manchette of measuring blood pressure, 3 types (for adult, infant and neonatal) shall be included.

(8) Policy for Procurement Measures and Time Schedule

The planned equipment for the Project consists of General X-ray machine and ancillary equipment, ultrasound machine and patient monitor. There is no equipment produced in Cambodia among the planned equipment. Thus, all planned equipment shall be procured from Japan. For the transportation from main ports in Japan to Sihanoukville port in Cambodia shall be sea freight by regular container vessel. For the transportation from Sihanoukville port to each site (21 hospitals) shall be truckage. As all sites are located at the capital of provinces and places along the main roads, it is not difficult to access to the sites.

Regarding the procurement schedule, it takes around 8 months in total such as 2 weeks for ordering preparation, 4 months for manufacturing, 2 weeks for pre-shipment inspection, 2 weeks for sea freight, 2 weeks for customs clearance and 2 months for installation, final inspection and handing over. The time of inland transportation in Cambodia and

installation shall be set during dry season from December to February.

2-2-2 Basic Plan

(1) Equipment Plan

Regarding the validity of General X-ray machine, Ultrasound machine and Patient monitor, the following points has been considered.

1) General X-ray machine

According to the guideline for the CPA RHs established by the MOH, the CPA3 RHs should have a fixed type and a mobile type of X-ray machines as equipment for an X-ray examination. As a result of the field survey, it was confirmed that in around the half of the targeted hospitals, the mobile type was used as fixed type because there was no fixed type of the machine. In most of the hospitals which had the fixed type, the machines should be considered to replace the existing ones with new ones due to deterioration. Providing both types of the machines is necessary because the features and objectives of use are different in the National and CPA3 RHs.

Comparison between Both Machines

Features	Fixed X-ray	Mobile X-ray
The quality of film	○	△
Degrees of freedom of physical condition	○	△
Shooting of thick part	○	△
Required Conditions of power source of supply	△	○
Protection against X-ray	Needed	Unneeded, although it depends on the situations
Degrees of freedom of shooting places	Only X-ray room	Free

In particular, the plan is valid due to the following aspects: it is difficult to use the mobile type of the machine in order to diagnose tuberculosis which records a high morbidity in Cambodia and countermeasures against tuberculosis such as the recovery of minimum standard level should be promoted in the hospitals. Although some of the hospitals requested mobile machines, these will not be included in this project because there are the mobile machines with good conditions in all hospitals.

2) Ultrasound machine

Recently, an examination by ultrasound machine has been considered as a method of fundamental diagnosis with imaging globally because it is easy to acquire useful

information for a diagnosis without a burden on patients. In Cambodia, this machine is popular as well and the guideline of CPA3 mentions that the hospitals should have one machine at least. The results of the field survey showed this equipment was used in all hospitals. However, this equipment may deteriorate by being used for a long term because this is precision electronic equipment with a probe with sensitive parts. Therefore, the replacement of the items which have been introduced for a long time with the new equipment should be expected owing to several problems, including partly missing x-ray images, deterioration of quality of images and partly damaged of keyboards. Most of existing machines are portable with a small monitor. Some patients selected private clinics to undergo the examination because it is difficult to trust the existing machines in public hospitals. Consequently, most of them visit public hospitals with their images for diagnostic purposes.

The cost of the examination of public hospitals is approximately half of that of private clinics. In this situation, patients have to waste longer time and much expenditure. From this aspect, the plan which includes the replacement of the decrepit equipment with new ones and supplying new equipment in some hospitals is valid.

From the field survey, three kinds of ultrasound machine were discussed because some facilities required having medical examination of circulatory diseases and there were some requirements of the obstetrics and gynecology departments.

① For a general examination

Mentioned the above, it is basically valid.

② For a medical examination of cardiac diseases

The CPA3 RHs should have this equipment because there is an issue of lifestyle-related illnesses in Cambodia. However, high technic is required to diagnose these kinds of diseases. Therefore, this equipment should be planned for facilities with specialists which diagnose cardiac diseases by the ultrasound machine.

③ For the obstetrics and gynecology departments

At the time of introducing an ultrasound machine, the machine was used in areas of the obstetrics and gynecology. These days this has been conducted with other examinations as a routine test due to a noninvasive test. Therefore, this is conducted in not only general examination rooms but also consulting rooms. Furthermore, reproductive health is one of the most important issues in Cambodia.

3) Patient monitor

In the field survey, most facilities required patient monitors due to putting them in not

only operation rooms, emergency rooms and/or Intensive Care Units (ICUs) but also general wards and other departments. The necessity of using the equipment in such places is acceptable because there are some individual rooms in order to investigate the patients with serious illnesses. However, the number of human resources is insufficient and it is necessary for them to take training to use the existing equipment effectively. Therefore, this plan proposes that operation rooms, recovery rooms, emergency rooms and/or ICUs will be equipped with the items and other departments will be required self-help efforts in order to furnish them. Furthermore, the departments to be targeted match the requirement of the list of equipment standards (one for operating rooms and two for emergency rooms).

(2) Planned Equipment

From the above study, the following criteria of the validity of evaluation has set and equipment plan were determined through evaluation of each hospital and equipment.

[Evaluation criteria]

- ① The equipment is necessary for diagnosis and confirmed with its validity.
- ② There are patients who need the equipment at the targeted health facilities.
- ③ There is a record of using the same or similar kind of equipment at the facilities.
- ④ Human resources for its operation are secured.
- ⑤ Installation places are secured.
- ⑥ Power sources are secured in the areas where equipment is installed.
- ⑦ There is a shortage of the equipment due to deterioration, compared to the required number to be replaced.
- ⑧ Budget for operation after providing the equipment is secured.
- ⑨ Validity is confirmed as the subject of Japanese grant aid.
 - The equipment is not used for personal use.
 - The equipment is not used for research.
 - The competition during a tender is secured.

Besides, the following additional criteria of evaluation for planning ultrasound machines and patient monitors were confirmed:

1) Ultrasound machine

① Ultrasound machines will be supplied to the obstetrics and gynecology departments which provide more than one thousand of ultrasound examinations each year. However, provision of the equipment will be considered, when a facility is located in inconvenient areas and have difficulties in receiving the tests due to long distance between an obstetrics and gynecology department and general examination room.

② If obstetrician clinics are provided with the equipment, the following conditions will be considered:

a) There are obstetricians in the facilities.

b) There are enough deliveries and Caesarean births.

c) It is possible to give training on diagnosis of ultrasound images to the doctors through the soft component project.

2) Patient monitor

① Operation rooms, recovery rooms and emergency rooms will be selected for the place of installation.

② The equipment will be shared at operating rooms and recovery rooms, if the number of operations each year is less than 1,000 and the rooms are connected to each other.

The results of study are shown in the Table 2-1 and an equipment plan is shown in Table 2-2.

Table 2-1 The Result of Equipment Evaluation

Name of Hospital	Requested Equipment	Request ed or not	Evaluation of Relevance									Total
			①	②	③	④	⑤	⑥	⑦	⑧	⑨	
Kampot RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	×	○	○	×
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for OT)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-
Kampong Chhnang RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-
Kampong Thom RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for emergency)	○	○	○	○	○	○	○	×	○	○	×
Siem Reap RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for emergency)	○	○	○	○	○	○	○	○	○	○	○
Battambang RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for emergency)	○	○	○	○	○	○	○	○	○	○	○

Criteria : ①Necessity for healthcare services ②Existence of patient ③Experience of use
 ④Securement of operation staff ⑤Securement of installation place ⑥Existence of electrical outlet
 ⑦Necessity of replacement or introduction ⑧Securement of operating budget
 ⑨Relevance of Grant Aid Project

Result: (o)Fulfilled (x) Not fulfilled (-) Not requested

Name of Hospital	Requested Equipment	Request ed or not	Evaluation of Relevance									
			①	②	③	④	⑤	⑥	⑦	⑧	⑨	Total
Mongkol Borey RH	General X-ray machine	-	-	-	-	-	-	-	-	-	-	-
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for general exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for emergency)	○	○	○	○	○	○	○	○	○	○	○
Stung Treng RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for OT)	○	×	○	○	○	○	○	○	○	○	×
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-
Kampong Speu RH	General X-ray machine	-	-	-	-	-	-	-	-	-	-	-
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-
Kratie RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for emergency)	○	○	○	○	○	○	○	○	○	○	○
Koh Kong RH	General X-ray machine	-	-	-	-	-	-	-	-	-	-	-
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	○	○	○	○	×	○	○	○	○	○	×
	Ultrasound machine (for general exam.)	△	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-

Criteria : ①Necessity for healthcare services ②Existence of patient ③Experience of use
 ④Securement of operation staff ⑤Securement of installation place ⑥Existence of electrical outlet
 ⑦Necessity of replacement or introduction ⑧Securement of operating budget
 ⑨Relevance of Grant Aid Project

Result: (o)Fulfilled (x) Not fulfilled (-) Not requested

Name of Hospital	Requested Equipment	Request ed or not	Evaluation of Relevance									
			①	②	③	④	⑤	⑥	⑦	⑧	⑨	Total
Kandal RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	○	○	○	○	×	○	○	○	○	○	×
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-
Takeo RH	General X-ray machine	-	-	-	-	-	-	-	-	-	-	-
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	○	○	○	○	×	○	○	○	○	○	×
	Ultrasound machine (for general exam.)	△	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for OT)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-
Prey Veng RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for emergency)	○	○	○	○	○	○	○	○	○	○	○
Svay Rieng RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×
	Ultrasound machine (for OBGY exam.)	○	○	×	○	○	○	○	○	○	○	×
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-
Sihanouk Ville RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for cardiac exam.)	○	○	○	○	×	○	○	○	○	○	×
	Ultrasound machine (for general exam.)	△	○	○	○	○	○	○	○	○	○	○
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for OT)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-
	Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-

Criteria : ①Necessity for healthcare services ②Existence of patient ③Experience of use
 ④Securement of operation staff ⑤Securement of installation place ⑥Existence of electrical outlet
 ⑦Necessity of replacement or introduction ⑧Securement of operating budget
 ⑨Relevance of Grant Aid Project

Result: (o)Fulfilled (x) Not fulfilled (-) Not requested

Name of Hospital	Requested Equipment	Request ed or not	Evaluation of Relevance										Total
			①	②	③	④	⑤	⑥	⑦	⑧	⑨		
Pursat RH	General X-ray machine	○	○	○	○	○	○	○	×	○	○	×	
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○	
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	×	○	○	×	
	Ultrasound machine (for OBGY exam.)	○	○	×	○	○	○	○	○	○	○	×	
	Patient monitor (for OT)	-	-	-	-	-	-	-	-	-	-	-	
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-	
Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-		
P.P. Municipal RH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○	
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○	
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for OBGY exam.)	○	○	○	○	○	○	○	○	○	○	○	
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○	
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-	
Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-		
K.S. Friendship NH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○	
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○	
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for cardiac exam.)	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for general exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Ultrasound machine (for OBGY exam.)	○	○	○	○	○	○	○	○	○	○	○	
	Patient monitor (for OT)	-	-	-	-	-	-	-	-	-	-	-	
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-	
Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-		
Preah An Duong NH	General X-ray machine	○	○	○	○	○	○	○	○	○	○	○	
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○	
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for cardiac exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Ultrasound machine (for general exam.)	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○	
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○	
Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-		
Preah Kossamak NH	General X-ray machine	-	-	-	-	-	-	-	-	-	-	-	
	Automatic film processor	○	○	○	○	○	○	○	○	○	○	○	
	X-ray protection equipment	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for cardiac exam.)	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for general exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Patient monitor (for OT)	○	○	○	○	○	○	○	○	○	○	○	
	Patient monitor (for recovery)	○	○	○	○	○	○	○	○	○	○	○	
Patient monitor (for emergency)	○	○	○	○	○	○	○	○	○	○	○		
National Pediatric NH	General X-ray machine	-	-	-	-	-	-	-	-	-	-	-	
	Automatic film processor	-	-	-	-	-	-	-	-	-	-	-	
	X-ray protection equipment	-	-	-	-	-	-	-	-	-	-	-	
	Ultrasound machine (for cardiac exam.)	○	○	○	○	○	○	○	○	○	○	○	
	Ultrasound machine (for general exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Ultrasound machine (for OBGY exam.)	-	-	-	-	-	-	-	-	-	-	-	
	Patient monitor (for OT)	-	-	-	-	-	-	-	-	-	-	-	
	Patient monitor (for recovery)	-	-	-	-	-	-	-	-	-	-	-	
Patient monitor (for emergency)	-	-	-	-	-	-	-	-	-	-	-		

Criteria : ①Necessity for healthcare services ②Existence of patient ③Experience of use
 ④Securement of operation staff ⑤Securement of installation place ⑥Existence of electrical outlet
 ⑦Necessity of replacement or introduction ⑧Securement of operating budget
 ⑨Relevance of Grant Aid Project

Result: (o)Fulfilled (x) Not fulfilled (-) Not requested

Table 2-2 Equipment Plan

No.	Name of Hospital	X-ray System														Ultrasound Machine				Patient Monitor	
		General X ray machine (smaller capacity type)	General X ray machine (larger capacity type)	X ray machine (mobile type)	Automatic film processor	X ray protection box (Type1)	X ray protection box (Type2)	X ray protection box (Type3)	X ray protection box (Type4)	X ray protection equipment	Ultrasound machine (for cardiac and general exam.)	Ultrasound machine (for gengeralexam.)	Ultrasound machine (for OBGY exam.)	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned
		No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned	No.of requested	No.of planned
1	Kampt RH	1	1	-	-	-	-	1	0	1	1	-	-	1	0	-	-	1	0	6	0
2	Kampong Chhnang RH	1	1	-	-	-	-	1	1	1	1	-	-	1	1	-	-	2	1	-	3
3	Kampong Thom RH	1	1	-	-	-	-	1	1	-	-	-	-	1	1	-	-	1	0	1	3
4	Siem Reap RH	1	1	-	-	-	-	1	1	-	-	-	-	1	1	-	-	2	0	1	3
5	Battambang RH	1	1	-	-	-	-	1	1	-	-	-	-	1	1	-	-	0	1	1	4
6	Mongkol Borey RH	-	-	-	-	-	-	1	1	-	-	-	-	1	1	1	1	-	-	-	4
7	Stung Treng RH	1	1	-	-	-	-	1	1	-	-	-	-	1	1	-	-	1	0	1	0
8	Kampong Speu RH	-	-	-	-	-	-	1	1	-	-	-	-	1	1	1	0	-	1	-	1
9	Kratie RH	1	1	-	-	1	0	1	1	-	-	1	1	1	1	-	-	1	0	1	4
10	Koh Kong RH	-	-	-	-	1	0	1	1	-	-	-	-	1	1	1	0	-	0	1	1
11	Kandal RH	1	1	-	-	1	0	1	1	1	1	-	-	1	1	1	0	1	0	1	2
12	Takeo RH	-	-	-	-	-	-	1	1	-	-	-	-	1	1	1	0	-	1	-	1
13	Prey Veng RH	1	1	-	-	-	-	1	1	1	1	-	-	1	1	-	-	1	0	1	3
14	Svay Rieng RH	1	1	-	-	-	-	1	1	1	1	-	-	1	1	-	-	1	0	1	2
15	Sihanouk Ville RH	1	1	-	-	-	-	1	1	-	-	-	-	1	1	1	0	-	1	-	0
16	Pursat RH	1	0	-	-	-	-	1	1	-	-	-	-	1	1	-	-	1	0	1	0
17	PP. Municipal RH	1	1	-	-	-	-	1	1	-	-	1	1	1	1	-	-	1	1	1	1
18	K.S. Friendship NH	-	-	1	1	-	-	1	1	-	-	-	-	1	1	1	1	-	-	1	0
19	Preah An Duong NH	1	1	-	-	-	-	1	1	1	1	-	-	1	1	-	-	1	1	-	2
20	Preah Kossamak NH	-	-	-	-	-	-	1	1	-	-	-	-	1	1	1	1	-	-	-	5
21	National Pediatric NH	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	0
Total		14	13	1	1	3	0	20	19	6	6	3	3	1	1	1	1	1	1	155	39

(-) Not requested (0)Requested but decided to be not included

2-2-3 Outline of Design

The drawings of the targeted hospitals where General X-ray machine is to be installed are attached in appendices.

2-2-4 Implementation plan

(1) Implementation Policy

The cooperation of Japanese side is planned for procurement and installation of medical equipment (General X-ray Machine, Ultrasound Machine and Patient Monitor). The scope of work to be borne by Japanese side in this project is performed according to the scheme of grant-aid of Japanese government.

This project will be signed on the exchange of notes (E/N) between Cambodian government and Japanese government after the Japanese cabinet approves. After that the grant agreement (G/A) will be signed between Cambodian government and JICA, and this project will officially go on. After signing the E/N and G/A, the consulting contract will be signed in a short period between the implementing agency of Cambodia and the consulting firm incorporated in Japan, who will prepare the project design of this project. The tender will be conducted to select the supplier corporate in Japan who will supply the equipment based on the project design prepared above. The contract will be signed between the firm awarded in this tender and the implementing agency of Cambodia, and the procurement and installation of equipment in accordance with the contract.

The basic principles and the matters to be considered are as follows:

1) Implementing Agency

The MOH of Cambodia is an implementing agency and is responsible for the works which shall be implemented by Cambodian side.

2) Consultant

After signing the E/N between both government and G/A between Cambodian government and JICA, the consultant from Japan will conclude the contract with the implementing agency of Cambodia according to the procedures of grant-aid of Japanese government. The consultant will be responsible for the following works in the contract.

Design Stage : Final confirmation of the contents of plan, preparation of detailed design documents including specifications, other technical information, tender documents, support of the execution of the tender, evaluation of the tender documents, and support of the contract with the supplier.

Procurement Stage : supervision for procurement, installation, operational training and management for maintenance of equipment.

“Design Stage” is to determine the details of the plan on equipment based on the preparatory survey report, and to prepare the tender documents including specifications, tender conditions and plans on various contracts related to the procurement of equipment. The estimation of expenses for the procurement of equipment is also included. The support of a tender is to attend the tender for selection of a supplier of equipment, and to advise on the procedures of documentation and the report to the Japanese government.

“Procurement Stage” is to check whether a supplier of equipment exactly follows the contract and to advise, guide and solve the problems for the involved personnel related. The main works of the consultant are as follows:

- ① Checking the schedule for procurement and installation, layout, specifications and other information provided by the supplier and the advice on their approval procedures
- ② Reporting the progress of procurement
- ③ Checking the quantity, quality and functions of the equipment prior to the shipment and issuing the approval
- ④ Checking the delivery, installation, instruction for operation and maintenance and operational training of equipment
- ⑤ Inspection of the equipment and attendance to handing over
- ⑥ The consultant, besides the above works, shall report a progress on the project to the relative agencies of Japanese government for its payment and completion of delivery.

3) Supplier

The supplier shall perform the procurement, delivery and installation of the equipment according to the contract, and shall give the instruction for operation and maintenance and operational training of the equipment. The supplier shall supply successively the spare parts free of charge during the guarantee period or with payment, and cooperate with the manufacturers and their agents for the technical support after handing over.

4) Japan International Cooperation Agency

Japan International Cooperation Agency (JICA) shall assist the smooth implementation of the Project according to the rules of grant-aid.

5) Procurement Schedule

The staff of implementing agency in Cambodia and the consultant will discuss the procurement plan during the time of detailed design. Japanese side and Cambodian side shall determine the each work clearly by confirming each other the starting time and the method in order to perform the work smoothly according to the work schedule mentioned in preparatory survey report.

(2) Implementation Conditions

The delivery schedule of equipment in this project must be seriously considered. The equipment procured from Japan will be landed at the port of Sihanouk Ville and transported in land by trucks to each project site via Phnom Penh. As the Project contains a large number of project sites of 21 all over the country. Besides, the Project sites are hospitals, so interruption against hospital services by installation of equipment should be minimized.

Installation and pre-handing over is planned to be completed site by site. The supplier, buyer, consultant and engineers of manufacturers and/or its agents attest installation and operational training of the medical equipment. Besides, considering prevention of an accident such as robbery of supplied equipment, the transportation from Phnom Penh to the sites shall be synchronized with the schedule of installation at each site, instead of the transportation in a lump. Therefore, the plan for procurement shall be made out with sufficient consideration of the management of inland truck transportation and the schedule management with local transportation companies.

(3) Scope of Works

The list below shows the work assignment of this project for both Japanese side and Cambodian side.

Table-2-3 Scope of Works

Works	Japan	Cambodia
Procurement of equipment		
- Procurement of equipment	○	
- Installation of equipment	○	
- Initial operation	○	
- Instruction for operation and maintenance	○	
- Legal procedures and/or inspection on installation		○
Utilities		
- Preparing electrical supply needed, electrical outlet etc.		○
- Preparing the space for installation and the removal of the existing		○
- Connecting work(from electrical outlet, etc.) to the equipment	○	
Transportation and customs clearance		
- Transportation to the sites (21 hospitals)	○	
- Customs clearance	○	○
- Tax exemption		○
Banking arrangements and payment of banking charges		○
Assistance for migration of persons in charge of the project		○
Appropriate and effective O&M for procured equipment		○
Procedures of approval for implementation of the project		○
All expenses for the project other than the fund from Japan side		○

(4) Consultant Supervision

1) Policy for equipment procurement supervision

All the equipment is procured from Japan. The inspection of equipment is performed at the loading port, prior to the shipment, by the entrusted and neutral inspection agency. The consultant shall check the inspection report provided in writing by the inspection agency, and shall issue the inspection report to the implementing agency of Cambodia after confirming the completion of inspection. All the equipment procured in this project shall be inspected and temporary handed over at each site. Final handing over shall be conducted in presence of the buyer, supplier and the consultant in Phnom Penh. The names of models, origin of product, names of manufacturers, stickers printing the name of Japanese grant-aid attached or not and appearance are inspected following the items in the contract of procurement.

2) Procurement Supervision Plan

Regarding procurement supervision, the following consultants shall be assigned.

- Procurement supervision engineer A : 1 person
Final confirmation of Inspection/Handing over in Phnom Penh
- Resident procurement supervision engineer A : 1 person
Procurement supervision, Temporary Inspection/Handing over for X-ray machine
- Resident procurement supervision engineer B : 1 person
Procurement supervision, Temporary Inspection/Handing over for X-ray machine
- Procurement supervision engineer B : 1 person
Procurement supervision, Temporary Inspection/Handing over for Ultrasound machine and Patient monitor
- Inspection engineer A : 1 person
Confirmation for procurement schedule after the contract between Cambodian side and a supplier
- Inspection engineer B : 1 person
Preparation for third party inspection prior to the shipment, checking the certification of the inspection

(5) Quality Control Plan

Out of all the equipment procured for this project, the goods procured from Japan shall conduct pre-shipment inspection by third party inspection organization at a port of loading.

(6) Procurement Plan

The equipment planned for procurement in the Project is General X-ray machine and ancillary equipment, Ultrasound Machine and Patient Monitor. There is no equipment manufactured in Cambodia. All equipment shall be procured from Japan. Regarding General X-ray machine, Ultrasound machine and patient monitor, manufacturers supposed to be suppliers in the Project have their own agents in Cambodia. Those agents have capabilities both of sales and after sales services with their own engineers. Furthermore, those agents can make maintenance contract with provincial hospitals targeted in the Project. Therefore, there would be no problem in maintenance. Regarding transportation, from the port in Japan to Sihanoukville port in Cambodia shall be seafreight by container vessel. From Sihanoukville port to each site (21 hospitals) shall be transported by truck.

Table2-4 Country/Area of Procurement

Category of Equipment	Country/Area of Procurement		
	Local	Japan	Third Counties
General X-ray machine		○	
X-ray automatic film Processor		○	
X-ray protection box		○	
Ultrasound machine		○	
Patient monitor		○	

(7) Operation Guidance Plan

Regarding General X-ray machine and ancillary equipment, Ultrasound machine and Patient monitor, the engineers of the manufacturers and/or its agents will give the installation, the instruction for operation and maintenance and operational training of the equipment procured in the Project after the delivery. The consultant will check if the guidance is properly performed. The consultant shall also confirm if the persons in charge at each hospital well understand or not after having the interviews with the responsible persons for practical use of hospitals where the medical equipment is installed.

All expenses for the said installation and trainings shall be borne by Japan side.

(8) Soft Component (Technical Assistance) Plan

The planned equipment of the Project has been used in all hospitals and there will be without any problems of using them. However, it will be useful for the medical staff to go through refresh training in adequate methods of using the supplied items for a long time, since their technical level seems inadequate in provincial RHs.

1) Maintenance management system of the equipment

The MOH in Cambodia established various policies, including building medical facilities and provision of medical equipment as an important issue. A list of standard medical equipment was confirmed and establishing of maintenance management system was promoted in CPA3RHs and CPA2 RHs. As a result, there are provision of the system technician and equipment management registers and establishing reporting system of the MOH. In addition, training programs are regularly provided to improve their skills. However, their technical level seems inadequate due to the followings:

- ① A range of the targeted equipment is extremely wide and there is a lack of time for training.
- ② It is difficult to provide appropriate training such as individual sessions in each hospital owing to the existence of a large number of targeted hospitals.
- ③ It is hard to give effective training to them because their skills are various in each site.

- ④ It is difficult to secure a training schedule because the prospective staff to be participated in that training has a routine work.
- ⑤ It is difficult to secure the staff with sufficient skills due to a lack of the number of technicians.

Therefore, this technical assistance is necessary to improve the maintenance management system because the technicians of hospitals should have responsibility for the management system.

2) Ability of Clinical levels

The planned equipment of the Project is used in all hospitals and there will be without any problems in using it. However, it is important for medical staff to acquire sufficient clinical knowledge and experience, including the functions, the theories of movement and the characteristics of each equipment, clinical understanding, an appropriate ability of diagnosis and decision on policies of cure by using the data from the equipment. This point has been already recognized by the MOH and there are trainings continuously in all health facilities. However, there is a technical gap between central area and provincial areas because insufficient opportunities of education in provincial areas contributed to lower skills. Therefore, providing specific clinical training in the planned equipment to the staff is expected.

From the above aspects, two kinds of training will be conducted through soft components. The details are as follows:

- ① Training in improvement on an equipment maintenance and management skill of the supplied equipment
- ② Training in improvement on management of the supplied equipment and a diagnostic technique.

(9) Implementation Schedule

The project shall be implemented in two steps of the detailed design and the procurement of equipment after concluding the E/N between both countries and G/A between the Government of Cambodia and JICA. After G/A, the agreement on consulting services between the executing agency of Cambodia and the consultant shall be signed and the implementation shall start. The following table shows the working schedule of the work charged to Japan side.

Table2-5 Implementation Schedule

Subject \ Month	1	2	3	4	5	6	7	8	9	10	11	12
Design Stage	(Final Confirmation for Equipment Specs)	(Finalization of Tender Documents)	(Approval of Tender Documents)	(Tender Announcement)	(Tender Evaluation)						(Around 3 months)	
Procurement Stage				(Confirmation for Equipmet Drawings)	(Equipment Procurement)				(Third Party Inspection prior to the Shipment)		(Around 8 months)	
									(Transportation)	(Installation and Inspection)		
Soft Component											(Around 2 months)	(Soft Component)

2-3 Obligations of Recipient Country

The following table shows the work charged to Cambodian side which was agreed at the time of the study for basic design.

Table2-6 Scope of Work for Cambodian Side

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
2	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		●
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
4	To ensure that the products be maintained and used properly and effectively for the implementation of the Project		●
5	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
6	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

The scope of the Project is procuring equipment. Therefore, there is no necessity of construction work for the Government of Cambodia basically. However, it is recommended to ensure the suitable amount of electric capacity in X-ray room to make the most possible use of General X-Ray machine.

To implement the project smoothly, it is preferable for this work to be done with the responsibility of MOH and each hospital.

2-4 Project Operation Plan

(1) Operation System and Plan

1) Operation System

The responsible authority and implementing agency of this project is the MOH. The target sites of this project are 17 provincial and 4 NHs; Provincial hospitals are under control of Provincial Health Department (PHD) allocated to each 24 provinces and municipal by MOH and NHs are directly under control of Directorate General for Health of MOH.

MEDEM2 Project has been implementing to provide technical assistance in cooperation with the National Workshop Team of MOH for medical equipment (ME) management at the same RHs with the Project. After implementation of the Project, alignment with MEDEM2 Project would be expected for the efficient equipment management.

The Project operation system is shown in the following Figure.

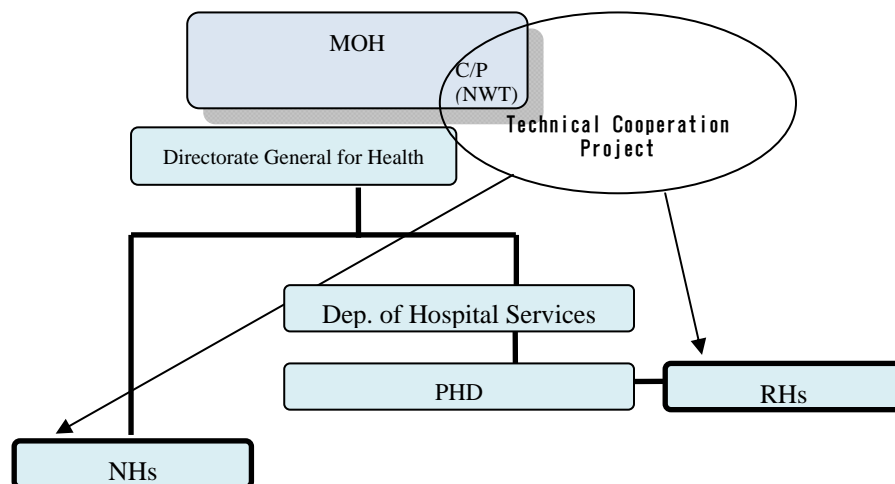


Figure2-1 Implementation System of the Project

2) Operation and financial Plan

In this project, MOH plays a role as a supervisory authority for the target hospitals in order that the project would be properly implemented MOH, with the situation of each hospital, promotes them to have the project implemented and functional after implementation.

Although MOH is reported with hospitals situation through Annual Operation Plan (AOP) submitted by hospitals and supports their activities, in response to the

decentralization of government, the targeted 21 RHs have to carry out the project operation after equipment procurement.

To maintain effective operation, each hospital is required to ensure appropriate budget for the project. Regarding hospital revenue, there are two main budgets; one is national budget allocated by the Ministry and the other is hospital income by user fee.

The Ministries examine the hospital budget based on AOPs which are submitted by the hospitals. The budget from the Ministry accounts for large part of hospital revenue, and this system is called Service Delivery Grants (SDGs).

Central Medical Stores (CMS) under control of MOH is another supporting system for the target hospitals. This system does not support funds but provide medicine, consumables directly to the hospitals.

The service delivery system and flow of Funds is shown as blow.

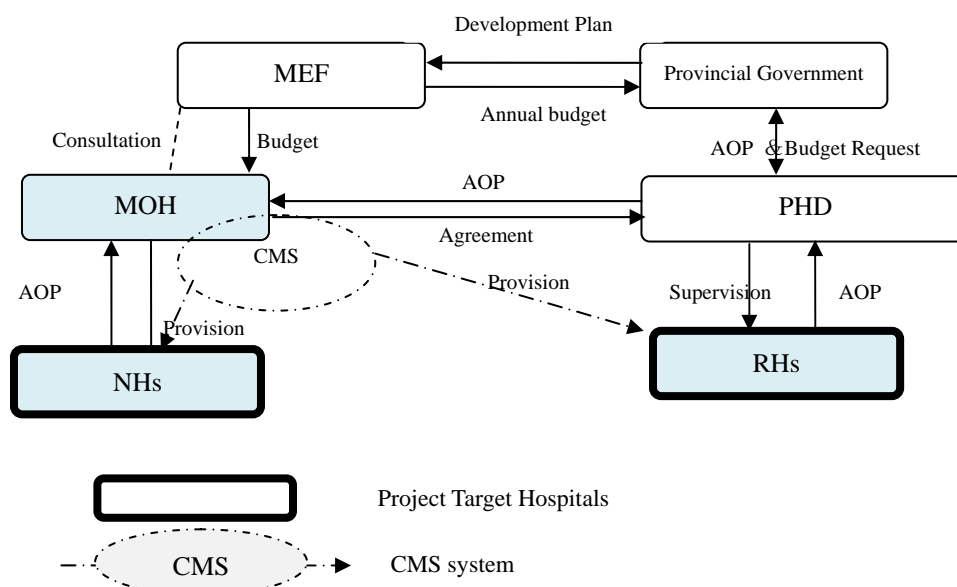


Figure2-2 Health System in Cambodia and Budget Flow

Thus system supports each hospital's fundamental service delivery by providing funds and goods, however, it is not always enough for hospital operation. To supplement this insufficiency, hospitals utilize own income coming from such as user fee, however, still they are facing lack of budget to maintain smooth operation.

In order to improve this situation, each hospital is requested independent efforts; to improve their hospital services, to propose the appropriate plan with forward strategy, to lobby for the PG and Ministry for them to understand hospital needs. Furthermore, the Ministry has to make a plot with appropriate information of each hospital, correspond to their necessity promptly and ensure enough budgets for better hospital services.

(2) Maintenance Plan

1) Equipment Maintenance System in Hospitals

As already mentioned, targeted 21 RHs have to carry out equipment maintenance as their own responsibility in response to the decentralization of government.

The planned equipment, such as X-ray machine, ultrasound machine and patient monitor is already utilized for hospital services at 21 hospitals targeted by the Project. Hence, the present organizational system is sufficient to manage the equipment maintenance. Under the guidance of MEDEMs, the staffs who can handle at least basic operation and maintenance of the equipment have already been assigned at each hospital.

Example of Operation System at hospital is shown below.

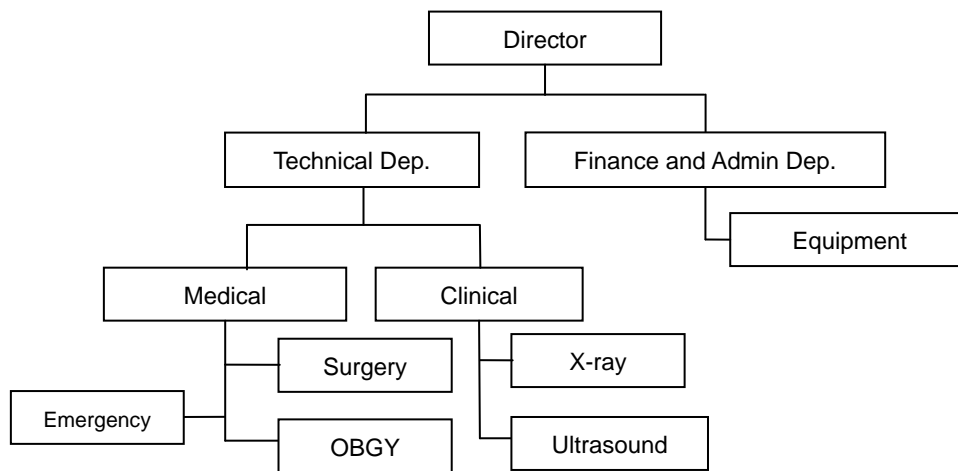


Figure2-3 Example of Operation System at Hospital

2) Medical Equipment Maintenance Activities at Hospitals

The following operations are suggested for appropriate medical equipment maintenance.

- a. Start-up inspection
- b. After-work cleaning/ inspection
- c. Handling and repairing in failure
- d. Procurement and Inventory management of consumables and spare parts

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The details of estimated expenses to be borne at Cambodian side are as follows based on the conditions for calculating the amount shown in (2).

(1) Expenses to be borne by Cambodian Side

Table 2-7 Estimated Project Cost

4,807,692 Cambodian Riel (KHR) (Approx. 0.1 million Yen)

Item	Estimated Cost
Banking Commission	4,807,692 KHR (Approx.0.1 mill.Yen)

(2) Conditions for the Cost Estimation

- 1) Time of Estimation : November 2010
- 2) Exchange Rate : 1 US\$ = ¥88.00/ 1 KHR= ¥0.0208
- 3) Procurement Schedule : Required duration for Design Stage and Procurement Stage is as shown in the Procurement Schedule.
- 4) Other : Cost Estimation shall be calculated based on the system of Japan Grant Aid.

2-5-2 Operation and Maintenance Cost

(1) Operation Cost

1) MOH

The expenditure of the MOH in 2009 is approximately 522,926 million KHR. The details are shown in the following table.

Table 2-8 Expenditure of the MOH

(Mill. Khmer Riel)

Items	2006	2007	2008	2009	2010
At the central level	181,466	254,242	311,421	368,716	N/A
At provincial Level	78,479	96,516	124,407	154,210	N/A
Total	259,945	350,758	435,828	522,926	N/A

Note) Fiscal term is from January to December

Source: Answers to the questionnaires by the MOH

There are two types of the budget for the MOH: the funds for the central level and the allocation to the provincial level. The actual expenditure of the central level includes operation cost of the MOH, the NHs, National centers (including CMS), was amounted to 368,716 million KHR in 2009. In contrast, another kind of the budget for the MOH covers operating cost of the provincial level was 154,210 million KHR in 2009.

Furthermore, expendable supplies and chemicals are provided by the CMS, whose funds are included to the central budget. The planned instruments will require the following consumables:

Table2-9 Expendable supplies by the CMS

Equipment	Consumable Spare parts	Supply for each CPA3 RH (Average)	Supply for each NHs (Average)
X-ray machine	X-ray film	8,400	3,000
Automatic developing machine	Developing solution	Powdery:22.5L Liquid:480L	Powdery: 135L Liquid:40L
	Fixing solution	Powdery:22.5L Liquid:480L	Powdery: 135L Liquid:40L
Ultrasound machine	Gel	168kg	20kg
Patient monitor	Cream	N/A	N/A

1) Budget for hospitals

The results of answers to the questionnaires by each hospital indicate the following averages of their funds.

Table 2-10 Average Income of CPA3 RHs (Approx.)

1 KHR=0.0208YEN

	Total	MOH	Patient Fee
Average (Million KHR)	4,184	2,898	1,345
Japanese Yen (Million Yen)	87	60	27

Source: Answers to the questionnaires by each hospital

Table 2-11 Average Income of the NHs (Approx.)

1 KHR=0.0208YEN

	Total	MOH	Patient Fee
Average (Million KHR)	7,806	6,096	2,586
Japanese Yen (Million Yen)	162	126	53

Source: Answers to the questionnaires by each hospital

Similarly, the results of answers to the questionnaires by each hospital indicate the following averages of their expenditures. The following tables show the details:

Table 2-12 Average Expenditure of CPA3 RHs (Approx.)

1 KHR=0.0208YEN

	Human resources	Maintenance of Medical Equipment	Pharmaceutical	Maintenance of facilities	Utility
Average (Million KHR)	826	58	1,963	47	297
Japanese Yen (Million Yen)	17	1.2	40	0.9	6

Source: Answers to the questionnaires by each hospital

Table 2-13 Average Expenditure of NHs (Approx.)

1 KHR=0.0208YEN

	Human resources	Maintenance of medical Equipment	Pharmaceutical	Maintenance of facilities	Utility
Average (Million KHR)	1,622	724	2,620	445	1,012
Japanese Yen (Million Yen)	33	14	54	9	21

Source: Answers to the questionnaires by each hospital

(2) Maintenance Cost

As mentioned in the above, the results of answers to the questionnaires by each hospital indicate that the annual average of maintenance cost for medical equipment is 58 million KHR (approximately 120 million yen) for CPA3RHs and 724 million KHR (approximately 1,400 million yen) for the NHs. The equipment maintenance cost of this project includes the cost for consumable and spare parts. Approximately 1,662 USD (approximately 150 Thousand Yen) will be needed by each hospital, if an x-ray machine, an automatic developing machine, an ultrasound machine and two patient machines are introduced. (A calculation basis of increase: Approximately 5% of the number of an examination of x-ray

increased and approximately 20% of the number of a test of an ultrasound images rose by providing the fixed x-ray machines to Takeo Hospital and Kampong Speu Hospital.)

Table 2-14 Estimated Annual Necessary Expenses⁸

1 USD=88 YEN

Equipment	Consumables Spare Parts	Estimated Increased Expenses	Verification	N.B.
X-ray machine	X-ray film	100	0.8 USD each×125 (5% of an average of the number of shooting of 2,500)	N/A
Automatic developing machine	Developing solution	600	50 USD/45L×12M (The required amount per month is approximately 45L.)	A trial calculation of the total amount to secure liquid.
	Fixing solution	540	45 USD/45L×12M (The required amount per month is approximately 45L.)	
Ultrasound machine	Gel	12	6 USD/5kg×2	N/A
	Printing ink	360	0.2 USD each×1,800 (An average of the number of diagnosis + the number of increase)	New introduction
Patient monitor	Cream	50	5 USD/250mg×10	N/A
Total		1,662 USD (146,256YEN)		N/A

The distribution from the CMS system and an income from patients such as the following figure can be used for the planned increase.

Table 2-15 Examples of Patient Fees of CPA3 RH⁹

1 KHR=0.0208 YEN

	Patient Fee at CPA3 RH(KHR)	(Yen)	Patient Fee at NHs (KHR)	(Yen)
A examination fee of x-ray	12,000	250	20,000~50,000	416~1,040
A examination fee of ultrasound	12,000	250	30,000~200,000	624~4,160

Source: Data of field survey

The number of purchasing replacement parts and using maintenance services of agencies will increase due to the high frequency of using the machines and deterioration. Therefore, an

⁸ This is a one of example case of providing an x-ray machine, an automatic developing machine, an ultrasound machine and two patient machines.

⁹ Examples of Patient Fees of CPA3 RH: Takeo Hospital, an example of the National Hospital: K.S. Friendship Hospital

insurance of an emergency fund and closing contracts of maintenance management with agencies is needed.

Table 2-16 Example of Maintenance Service Cost

1 USD=88 YEN

Equipment	Itemization	Amounts	N.B.
General machine X-ray	Maintenance Service by Local Agencies	3,000	N/A
Automatic Film Processor	Maintenance Service by Local Agencies	1,000	N/A
Ultrasound machine	Maintenance Service by Local Agencies	1,500	N/A
Patient monitor	Maintenance Service by Local Agencies	1,000	N/A
Total		6,500 USD (572,000 YEN)	

Evidence: Quotation by local agencies

The improvement on the current situation of the maintenance management system of the facilities is expected. Recently, a new project of the provision of spare parts has been discussed in HSSP2. However, the hospitals should ensure that the appropriate system will contribute to decreasing unnecessary expenditures and to improving the healthcare services in order to acquire an income of the facilities. Furthermore, developing future plans and securing the budget are required because the planned instruments in this project can work for only seven years in an appropriate way.

2-6 Other Relevant issues

As a result of field survey in Cambodia, the following issues were confirmed.

- (1) Facility construction and medical equipment procurement is undertaken by MOH using its own and HSSP2's budget or by a large number of donors. However, MOH mainly procure medical equipment through opened tenders because of its system and it often causes the cases that inexpensive equipment is procured such as made in China and it is broken easily within a year or two years even though it is brand-new. Thereafter, it is important to consider procurement planning and selects the manufacturers which has local agent providing reliable after-sales service and the model with appropriate specification such as Japan-made product.
- (2) The coordination having assistance among donors is not sufficient in terms of targeting

hospitals or departments and selecting manufacturers and model. Besides, NGO and the smaller-scale donors, work directory with the hospitals and provide assistance without informing MOH. Therefore, the circumstance of allocated equipment is widely different among the hospitals or the departments even in the same hospitals. This makes it complicated and difficult to maintain equipment such as repairing.

In this circumstance, there was a request from counterparts that the equipment planned in the Project should be uniform to the possible extent.

- (3) It is important to secure enough quantity of electricity to utilize the full performance of general X-ray machine procured by the Project. Some hospitals were confirmed the necessity of preparation, such as removing existing equipment or making space for equipment to be installed. It is strongly requested to be surely prepared before installing equipment under hospital's and MOH's responsibility.

CHAPTER 3: PROJECT EVALUATION

Chapter 3 PROJECT EVALUATION

3-1 Precondition for the Project

3-1-1 Precondition for implementing the Project

The purpose of the Project is procurement of medical equipment, which is mostly dilapidated, at the existing hospitals. Therefore, precondition for implementing the Project such as site acquisition or various permissions is basically not found.

3-1-2 Precondition and important assumption for achieving the whole plan of the project

The equipment planned by the project does not cover whole but partial items to improve services such as diagnosis and monitoring patients at hospitals. Diagnosis and medical treatment are so to speak the both sides of wheels of a car and absolutely imperative. In that sense, meaning, for enhancing the Project's effectiveness it is necessary that each hospital continuously improves and expands necessity equipment for its service, such as treatment.

Besides, if equipment is only improved, it would not lead to the progress of treatment performance. Appropriate technique for diagnosis and treatment should be associated with improving equipment. MOH regularly implements the variety of refresh training for medical staff. It would be one of the key component for achieving the Project's outcome that implementing trainings proactively and continuously to secure the progress of medical treatment technique.

3-2 Project Evaluation

3-2-1 Relevance

The relevance of the Project as a scope of Japanese grant aid scheme is confirmed in the following aspects;

1) Beneficiary targeted by the Project

The targeted areas of the Project are 16 provinces and 1 municipal and the direct beneficiaries are amounted to be 11 million¹⁰, 80% of total general nation's population in Cambodia (As of 2008). Therefore, the relevance is confirmed.

2) View of human security

The project purpose is "to improve the quality of healthcare services by providing medical equipment at the targeted NHs and CPA3 RHs". Implementing this project would contribute to

¹⁰ The number of targeted beneficiary was referred the data of Population census(2008) by National Institute of Statistics of Cambodia.

reduce the threat of 80 % of nation in Cambodia through improving the quality of healthcare services. The concept of human security places individual human beings at its core, seeking to defend them from fear and want: fear of things like conflict, terrorism, disaster, environmental destruction, and infectious disease, and want in the face of poverty and in social services and infrastructure. By building up people's abilities to address these issues themselves, this approach aims to build societies in which they can live with dignity.

From this point of view, the Project conforms the concept of human security and it is expected to lead nation to better living.

3) Technical level

The general-purposed equipment which does not required excessive advanced technique is planned in the Project and each hospital has already experienced to use it. Besides, the operation and maintenance of the equipment will be possible to be done in the range of own budget and system at hospital.

4) Contribution to mid-term and long-term development plan in the recipient country

A mission of the HSP2 is to improve the people's health status by improving the accessibility to basic health services and prevent disease especially for women, children and poor population. Improving medical equipment by the Project would indirectly contribute to better access of health service. On that point, this project is approved to be significant means for achieving national mission and the relevance of the project is fully confirmed.

5) Profitability

This project does not demand high profitability as it targets public NHs and provincial RHs. However, it is necessary to secure adequate operation cost for maintaining equipment appropriately. The project is expected to in directory contribute on increasing income from the patient fee of treatment and examination and it would help sustainability of the Project.

6) Impact on environmental and social aspects

X-ray protection is not fully furnished at a number of targeted hospitals. In case the hospitals procuring General X-ray machine by the Project, X-ray protection will be included in the plan as the associated with environment-friendly equipment.

7) Appropriateness under grant aid scheme

The status of the implementing agency's system; capability, human resources, budgetary plan and master plan, is appropriate, so the project is assessed that it is within the appropriate

scope of Japanese grant aid.

8) Necessity and superiority of Japanese technique

Japan has been continuously supporting Cambodian restoration and reconstruction. Improvement of health sector is considered to be the top priority of the national strategic in Cambodia, so providing continuous assistance and contributing to improve quality of health care services would show overwhelming presence to Cambodia as one of the leading donors.

Japanese medical manufactures receive recognition with their high technical level in producing X-ray machine, ultrasound machine and patient monitor and its high quality is appreciated in all over the world. Therefore, this project can prove the effectiveness of Japan's assistance.

3-2-2 Effectiveness

Expected outcome by implementing the Project is shown in the following chart.

(1) Quantitative effect

① Compendium of quantitative effect

Table 3-1 Chart of Quantitative Effect

	Index	Baseline Data (2009)	Target (2013)
a	To fulfill the standard number set by MOH of fixed general x-ray machine at CPA3 level hospital	29% Ratio of CPA3 RHs equipped fixed general x-ray (Table 3-2①)	100%
b	To fulfill the standard number set by MOH of ultrasound machine at CPA3 level hospital	76% Ratio of CPA3 RHs equipped ultrasound machine (Table 3-2①)	100%
c	To fulfill the standard number set by MOH of patient monitor at CPA3 level hospital	29% Ratio of CPA3RHs equipped patient monitor (Table 3-2②)	100%
d	To increase the number of hospitals which are planned to be equipped general X-ray machine	3 (Table 3-2③)	14
e	Increase of the X-ray examination taking ultrasound examination	45,326 (Table 3-2③)	Increased by 5% or more
f	Increase of the patient number taking ultrasound examination	37,919 (Table 3-2③)	Increased by 20% or more

② Baseline data

Table 3-2① Equipment Status

Equipment		General X-rat	Ultrasound	Patient Monitor
Standard number at CPA3level hospital ¹⁾		1 unit	1 unit	3 unit (OT, Emergency)
Hospitals		Equipment		
		General X-ray	Ultrasound	Patient Monitor
1	Kampot	N	Y	Y
2	Kampong Chhnang	N	N	N
3	Kampong Thom	N	Y	N
4	Siem Reap	N	Y*	N
5	Battambang	N	Y*	N
6	Mongkol Borey	Y	N	N
7	Stung Treng	N	Y	Y
8	Kampong Speu	Y	N	N
9	Kratie	N	Y	N
10	Koh Kong	Y	Y	N
11	Kandal	N	Y*	N
12	Takeo	Y	Y*	Y*
13	Prey Veng	N	Y	N
14	Svay Rieng	N	Y*	N
15	Sihanouk Ville	N	Y*	Y
16	Pursat	Y	Y	Y
17	P.P. Municipal	N	N	N
Number of hospitals already equipped (Y)		5	13	5
The ratio of equipped CPA3 RHs		29%	76%	29%

Note)

- The standard number of equipment at CPA3...Based on the “MEDICAL EQUIPMENT STANDARD LIST FOR CPA3 REFERRAL HOSPITAL”
- Y=Equipped N=Not equipped Y*=Already equipped but confirmed to be necessary for adding equipment because of necessity in different purpose or because of hospitals circumstances
- Slash ...Not targeted hospitals

Table 3-2② Facility for X-ray Protection

Hospitals		Status
1	Kampot	N
2	Kampong Chhnang	N
3	Kampong Thom	Y
4	Siem Reap	N
5	Battambang	Y
6	Mongkol Borey	
7	Stung Treng	Y
8	Kampong Speu	
9	Kratie	N
10	Koh Kong	
11	Kandal	N
12	Takeo	
13	Prey Veng	N
14	Svay Rieng	N
15	Sihanouk Ville	N
16	Pursat	
17	P.P. Municipal	N
18	K.S. Friendship	N
19	Preah An Duong	N
20	Preah Kossamak	
21	National Pediatric	
Number of hospitals already equipped (Y)		3
Number of targeted hospitals(Y+N)		14

Note)

a) Y=Equipped N=Not equipped

b) Slash ...Not targeted hospitals

Table 3-2③ Number of X-ray and Ultrasound Examination (2009)

	Hospitals	Number of Examination	
		X-ray	Ultrasound
1	Kampot	1,684	
2	Kampong Chhnang	1,127	1,494
3	Kampong Thom	2,556	
4	Siem Reap	7,265	5,635

5	Battambang	5,789	2,990
6	Mongkol Borey		1,350
7	Stung Treng	371	
8	Kampong Speu		631
9	Kratie	573	
10	Koh Kong		
11	Kandal	3,299	2,102
12	Takeo		4,114
13	Prey Veng	545	
14	Svay Rieng	2,955	3,429
15	Sihanouk Ville	989	1,625
16	Pursat	2,206	
17	P.P. Municipal	4,619	2,504
18	K.S. Friendship	9,724	8,772
19	Preah An Duong	1,624	173
20	Preah Kossamak		N/A
21	National Pediatric		3,100
Total		45,326	37,919

Note)

a) Slash...Not targeted hospitals

(2) Qualitative effect

- ① To implement appropriate diagnosis and treatment to the patients in the targeted area and performing suitable care for the patients in serious condition
- ② To improve medical security by furnishing X-ray protect box to the hospitals without protecting facility
- ③ To contribute to improve the function of the referral system so that targeted hospital can accept the patients who used to be transferred to other hospitals.

A P P E N D I C E S

1. Member List of the Study Team

1) Outline Design Study

	Name	Position	Job Title	Duration of Stay
1	Mr. Seiji KATO	Chief/ Planning Management	Advisor, Health Division 3, Human Development Department, JICA	2010.10.30-11.7 & 2010.11.23-11.27
2	Dr. Yorihiro USUDA, M.D., Ph.D.	Hospital Management	Medical Officer, Department of International Medical Cooperation, Japan National Center for Global Health and Medicine	2010.10.31-11.7 & 2010.11.16-11.27
3	Mr. Yasumichi DOI	Project Manager/ Equipment Planning 1/ Facilities Planning 3	INTEM Consulting, Inc.	2010.10.31-11.28
4	Mr. Akihiro OKAMOTO	Equipment Planning 2 / Cost & Procurement Planning 1	INTEM Consulting, Inc.	2010.10.31-11.28
5	Ms. Tomoko KORI	Equipment Planning 3 / Cost & Procurement Planning 2	INTEM Consulting, Inc.	2010.10.31-11.28
6	Mr. Kyoichi SUGIYAMA	Facilities Planning 1	INTEM Consulting, Inc.	2010.10.31-11.28
7	Mr. Nobuyoshi FURUICHI	Facilities Planning 2	INTEM Consulting, Inc.	2010.10.31-11.28

2) Explanation on Draft Report

	Name	Position	Job Title	Duration of Stay
1	Mr. Seiji KATO	Chief/ Planning Management	Advisor, Health Division 3, Human Development Department, JICA	2011.2.13-2.20
2	Dr. Yorihiro USUDA, M.D., Ph.D.	Hospital Management	Medical Officer, Department of International Medical Cooperation, Japan National Center for Global Health and Medicine	2011.2.13-2.18
3	Mr. Yasumichi DOI	Project Manager/ Equipment Planning 1/ Facilities Planning 3	INTEM Consulting, Inc.	2011.2.13-2.20
4	Mr. Akihiro OKAMOTO	Equipment Planning 2 / Cost & Procurement Planning 1	INTEM Consulting, Inc.	2011.2.13-2.20
5	Ms. Tomoko KORI	Equipment Planning 3 / Cost & Procurement Planning 2	INTEM Consulting, Inc.	2011.2.13-2.20

2. Study Schedule

1) Outline Design Study

Date				Mr. Kato	Mr. Usuda	Mr. Doi	Mr. Okamoto & Mr. Furuichi	Ms. Kori & Mr. Sugiyama
0	10/30	Sat	AM PM	Manila - Phnom Penh				
1	10/31	Sun	AM PM	Preparation	Narita - Bangkok - Phnom Penh			
2	11/1	Mon	AM PM	9:00 - 10:00 briefing on security management at JICA Cambodia Office Office 15:00 - 16:30 Courtesy call to EoJ 17:00 - 18:00 Courtesy call to JICA Cambodia Office				
3	11/2	Tue	AM PM	14:00 - 14:30 Courtesy call to Prof. Eng Huot 14:30 - 17:00 Kick-off meeting with MOH				
4	11/3	Wed	AM PM	9:30 - 12:00: Visit to Kossamak hospital 12:30 - 13:30 Meeting with WB, at WB Office			Relevant Study (on local legislation, agency, donor etc.)	
5	11/4	Thu	AM PM	9:00 - 12:00: Visit to Kandal hospital 16:00 - 17:00 Meeting with GTZ, at GTZ Office			14:30 - 15:30 Meeting with Dr. Or Vandine, Director of DIC at MoH (DIC Office)	
6	11/5	Fri	AM PM	14:30 Discussion with MOH on M/M 8:00 - 9:00 Meeting with HSSP2 Team			Relevant Study (on local legislation, agency, donor etc.)	
7	11/6	Sat	AM PM	Phnom Penh - Bangkok		Documentation		
8	11/7	Sun	AM PM	- Narita		Documentation		
9	11/8	Mon	AM PM			8:30 - 12:00 Visit to Phnom Penh Municipality Hospital 14:00 - 17:00 Visit to National Pediatric Hospital		
10	11/9	Tue	AM PM			National holiday/ Documentation		
11	11/10	Wed	AM PM			at 9:00 Visit to Ang Duong hospital	Phnom Penh - Kampong Thom	at 8:30 Visit to Kandal hospital
12	11/11	Thu	AM PM			at 9:00 Visit to Khmer - Soviet hospital	at 14:00 & 8:00 Visit to Kampong Thom hospital Kampong Thom - Siem Reap	at 8:00 Visit to Take hospital
13	11/12	Fri	AM PM			at 9:00 Visit to Kossamak hospital	at 8:00 Visit to Siem Reap hospital	at 8:00 Visit to Kampot hospital
14	11/13	Sat	AM PM			Documentation		Kampot - Sihanouk Ville Documentation
15	11/14	Sun	AM PM			Documentation Phnom Penh - Svay Rieng	Documentation Siem Reap - Mongkul Borei	Documentation
16	11/15	Mon	AM PM			at 8:00 Visit to Svay Rieng hospital	at 8:00 Visit to Mongkul Borei	at 8:00 Visit to Sihanouk Ville hospital
17	11/16	Tue	AM PM		Narita - Bangkok - Phnom Penh	at 8:00 Visit to Prey Veng hospital	at 8:00 Visit to Battambang hospital Battambang - Pursat	Sihanouk Ville - Koh Kong at 14:00 & 8:00 Visit to Koh Kong hospital
18	11/17	Wed	AM PM		9:00 Leave Phnom Penh - Steng Treng at 14:00 & 8:00 Visit to Steng Treng hospital		at 8:00 Visit to Pursat hospital Pursat - Kampong Chhnang	at 8:00 Visit to Koh Kong hospital
19	11/18	Thu	AM PM		Steng Treng - Kratie		at 8:00 Visit to Kampong Chhnang hospital / Kampong Chhnang - Kratie	Koh Kong - Kompong Speu at 8:00 Visit to Kompong Speu
20	11/19	Fri	AM PM		at 8:00 Visit ot Kratie hospital / Kratie - Phnom Penh		at 8:00 Visit to Kratie hospital at 11:00 Visit to Stung Treng hospital / Stung Treng -Phnom Penh	Kompong Speu - Phnom Penh 10:00 Visit Svay Rieng 14:00 Visit to Prey Veng
21	11/20	Sat	AM PM		Documentation			market survey
22	11/21	Sun	AM PM		Documentation	Discussion on M/M		
23	11/22	Mon	AM PM		Documentation	Study on relevant organizations	Study on market/other donors etc.	
24	11/23	Tue	AM PM	Narita - Bangkok	Documentation			
25	11/24	Wed	AM PM	8:30 Meeting with NWT Bangkok - Phnom Penh (by an early morning flight) / Discussion and drafting M/M 15:00 - 16:00 Meeting with EoJ				
26	11/25	Thu	AM PM	8:00 - 12:00 Discussion with MOH on M/M				
27	11/26	Fri	AM PM	(By morning) receiving feedback from DIC on M/M 16:30 - 17:30 Signing the M/M				
28	11/27	Sat	AM PM	- Bangkok - Narita		Phnom Penh - Bangkok		
29	11/28	Sun	AM PM			- Narita		

2) Explanation of the Draft

Date				Mr. Kato	Dr. Usuda	Mr. Doi	Mr. Okamoto	Ms. Kori
1	2/13	Sun	AM	Narita - Bangkok - Phnom Penh				
			PM					
2	2/14	Mon	AM	8:00 - 10:00 Meeting with JICA Cambodia Office 14:00 - 17:00 Visit to MOH/Explanation of Draft Report / Discussion on the Minutes				
			PM					
3	2/15	Tue	AM	11:00 Courtesy call to EoJ and discussion on MM 14:00 - 17:00 Discussion on the Minutes with MoH				
			PM					
4	2/16	Wed	AM	10:00 Signing the M/M				
			PM	Information exchange for supplemental study				
5	2/17	Thu	AM	10:00 Report to JICA office				
			PM	Documentation for Cabinet Meeting in April	Leaving Phnom Penh - Bangkok	Continue supplemental study		
6	2/18	Fri (National Holiday)	AM	Documentation	- Narita	Documentation		
			PM					
7	2/19	Sat	AM	Documentation	/	Documentation		
			PM	Leaving Phnom Penh - Bangkok		Leaving Phnom Penh - Bangkok		
8	2/20	Sun	AM	- Istanbul		- Narita		
			PM					

3. List of Parties Concerned in the Recipient Country

Department		Position	Name
MOH	Secretary of State		Professor Eng Huou
	General for Health	Deputy Director General for Health	Dr. Chi Mean Hea
	Hospital Services Department(HSD)	Director	Dr. Sann Sary
		Deputy Director	Dr. Sok Srun
		Chief of Hospital Services	Dr. Cheu Sivuthy
	Department of International Cooperation(DIC)	Director	Dr. Or Vandine
		Deputy Director	Dr. Pau Ann Sibutha
		Deputy Director	Dr. Moeung Vannarom
		Deputy Director	Mr. Sung Vinn Tak
	Department of Human Resources Development	Deputy Director	Dr. Phum sam son
		Deputy Director	Dr. Touch Sokneang
		Vice Chief of Lab. Bureau	Ms. Uch Monipheap
	Department of Budget and Finance		Ms. Moy Phally
		Accounting Official	Ms. Channa Kang
Department of Drugs and Food and Cosmetics	Vice-Director	Mr. Chroeng Sokhan	
HSSP II	Executive Program Admin	Dr. Uy Veng Ky	
	Pooled Funds Management Officer	Mr. Krang Sun Lorn	
	Chief Procurement Officer	Mr. Leng Sok Heng	
Central Medical Stores(CMS)	Director	Mr. Chea Chhiv Stong	
National Center	National Maternal and Child Health Center (NMHC)	Chief of Administration and Engineering Section	Mr. Hout Khom
		HSD Officer	Mr. Long Borin
		NWT	Mr. Chov Seang
		NWT	Mr. Chum Toma
		Radiologist	Mr. Tuy Pich
National Hospital	Khmer-Soviet Friendship NH	Director	Dr. Say Eengly
		Deputy Director	Dr. Tan Phally
		Technician	Mr. Suos kim Teng
	Preah Ang Duong NH	Director	Dr. Lou Ly Kheang
		Deputy Director	Dr. Lim Peng Sieng
	Preah Kossamak NH	Director	Prof. Teng Soeun
		Deputy Director	Dr. Lek Sokhocu
		Deputy Director	Dr. Ym Soparim
	National Pediatric NH	Director	Prof. Chhour Y Meng
		Deputy Director	Dr. Kdan Yuvatha
	Technician	Mr. Netha Vichea	
Provincial - Municipal			
Kampot	PHD	PHD	Mr. Meas Sapoeun
	Kampot RH	Deputy Director	Dr. Lon Ratanak
			Dr. Ith Vannary
		Chief maintaining	Ieng Chantola
Kampong Chhang	PHD	Deputy Director	Dr. Lim Leang Ngoun
	Kampong Chhang RH	Director	Dr. Sorinti Ravuthy
		Deputy Director	Dr. Nhoung Khosok
		Deputy Director	Dr. Tum Sambatil
		Chief of Technical	Mr. Ong Dara
		Chief of Administration	Mr. Sar Savath
Kampong Thom	PHD	Director	Dr. Srey Sin
	Kampong Thom RH	Director	Dr. Srey Sin
Siem Reap	PHD	Director	Dr. Kros Sarath
	Siem Reap RH	Director	Dr. Pen Phalkun
		Technician	Mr. Muth Sakmay
Battambang	PHD	Director	Dr. Nhek Bun Chhup
	BattambangRH	Director	Dr. Kak Seila
Banteay Meanchey	PHD	Director	Dr. Keo Sopheakra
	Cambodia-Japan Friendship Mongkol Borey RH	Director	Dr. Hou Sereywitchouk
		Health Information System	Mr. Ou Samath
		ME Technician	Mr. Im Thy
		ME Technician	Mr. Chou Praseur

Department		Job Title	Name
Stung Treng	Stung Treng RH	Deputy Director	Dr.Suy Sopheap
		Deputy Director	Dr.Dor Sottey
Kampong Speu	Kampong Speu RH	Director	Dr. Tim Thany
		Deputy Director	Dr.Dou Moeng
		ME Technician	Dr. Sim Song
		MEM	Mr. Sorin Thach
		Imagery Department	Dr. Chheng Sovatha
Kratie	PHD	Director	Mr.Chhneang Sovutna
	Kratie RH	Director	Dr.Khy Lay
		Deputy Director	Dr.Keang Hong
		In charge of ME	Mr.Top Sophanna
Koh Kong	PHD	Director	Mr. Chhea Huor
		Deputy Director	Dr.Dou Moeng
		Deputy Director	Dr. Mak Kimly
	Koh Kong RH	Deputy Director	Dr. Hay Layson
		Deputy Director	Dr. Sourn Samith
		OBGY doctor (French)	Dr. Masis Charlotte
Kandal	Kandal (Chey Chumneas) RH	Director	Dr. Kong Chhunly
		Deputy Director	Dr. Nou Sarom
		Chief of Imaging dpt.	Dr. Ty Chhay
		Anesthesiologist	Dr. Ly Makara
		Technician	Mr. Chum Pagha
		Chief of Radiological Technologist	Mr. Chov Seang, RT
Takeo	PHD	Deputy Director	Mr. Pho Thoi
	Takeo(Duon Keo) RH	Director	Dr. Di Khieve Sam Ros
		Deputy Director/ME	Dr. Chov Chnoun
		Chief of Nurse	Mr. Moug Chamroun
		Technician	Mr. Man Chenda
		Deputy of MED	Mr. Tao Ro
		Chief of Service Imagery	Dr. Tek Bunhone
Preh Sihanouk Ville	PHD	Deputy Director	Mr.Sechou Sethychot
	Sihanoukville RH	Deputy Director	Dr. Him Vibol
		Deputy of head Administration (Nurse)	Mr. Tuy Sareth
		X-ray Technician	Ms. Mak Bonarith
		Imagery Technical	Dr. Khim Sokhan
		Imagery technician	Mao Seng Hag
Pursat	PHD	Director	Dr. Khlem Sokun
	Pursat(Sampov Meas)RH	Director	Dr. Ky Kien Hong
		Deputy Director	Dr. Chan Sokha
		Accountant	Mr. Sim Hum
		Administration	Mr. Prum Sarom
		ME Technician	Mr. Soeng Samy
Phnom Penh	Phnom Penh Municipal RH	Director	Neth Sovirak
		Chief RX& Ultrasound	Sauth Bun Theem
		Deputy Director	Hong Cykoun
		Chief at ICU	Tah Feng Fab
		EMS	Chea Chaunarity
		Deputy Director	Dikoam Pmaly
Embassy of Japan		Ambassador	Mr. Masafumi Kuroki
		Councilor, Medical Attashe	M.D.Ph. D. Yoshiharu Fujita
		Head, Economic & ODA Section	Mr. Hideaki Matsuo
J I C A M E D E M II		Chief Advisor	Mr. Takeshi Matsuo
		Programme Assistant	Ms. Hean Sivhun
JICA National TB Control Project		Project Leader	Dr. Kosuke Okada
		Expert of Radiogy Interpretation	Dr. Takashi Yoshiyama
		Coodinator/ Expert	Ms. Kiyomi Yamamoto
JICA Cambodia Office		Representative	Mr. Yasujiro Suzuki
		Senior Representative	Mr. Yukiharu Kobayashi
		Project Formulation Advisor(Health)	Ms. Yumiko Sasaki
		Program Officer Health and Training Affairs	Mr. Soun Veasna

4. Minutes of Discussions (Preparatory Survey)

**MINUTES OF DISCUSSIONS
ON PREPARATORY SURVEY
ON THE PROJECT FOR MEDICAL EQUIPMENT PROVISION
FOR IMPROVING PUBLIC HEALTH SERVICES
AT NATIONAL, MUNICIPAL AND PROVINCIAL REFERRAL HOSPITALS
IN THE KINGDOM OF CAMBODIA**

In response to a request from the Royal Government of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Medical Equipment for Improving Public Health Services at National, Municipal and Provincial Referral Hospitals in Cambodia (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Kingdom of Cambodia a Preparatory Survey Team (hereinafter referred to as "the Team"), which is led by Mr. Seiji Kato, Advisor, Human Development Department of JICA headquarters, and is scheduled to stay in the country from 30th October to 28th November, 2010.

The Team held series of discussions with the officials concerned from the Royal Government of Cambodia and conducted a field survey at the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Phnom Penh, 26th November, 2010



Seiji Kato
Leader, Preparatory Survey Team
Advisor
Human Development Department
Japan International Cooperation Agency



Prof. Eng Huot
Secretary of State
Ministry of Health
Kingdom of Cambodia

ATTACHMENT

1. Objective of the Project

The objective of the Project is to provide medical equipment for the national, municipal and provincial hospitals in Cambodia, by identifying adequate equipment specifications and allocations, for better public health services in the country.

2. Project sites

The sites of the Project and their locations are shown in Annex-1.

3. Responsible and Implementing Agency

The Responsible agency is the Ministry of Health, Kingdom of Cambodia, Organization charts of the Ministry and the hospitals as candidate users of equipment are shown in Annex-2.

4. Items requested by the Royal Government of Cambodia

After discussions with the Team, the items described in Annex-3 were requested by Cambodia. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

5-1. The Cambodian side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-4.

5-2. The both sides will take the necessary measures, as described in Annex-5, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

6-1. Schedule of the study is shown in Annex-6.

6-2. JICA will prepare the draft report in English and dispatch a mission in order to explain its contents of the report from late January to early February, 2011.

6-3. In case that the contents of the report is accepted in principle by the Royal Government of Cambodia, JICA will complete the final report and send it to the Royal Government of Cambodia by the end of March, 2011.

7. Other relevant issues

7-1. The Team studies the current (1) infrastructure, budget allocation and other relevant conditions, (2) human resources for and their skills in the management and operation of equipment, and (3) maintenance of the equipment, in order for appropriate use of the equipment; and verifies the potential improvements of overall public health service through the provision. Based on the study result found by the Team, the project will determine the item, amount, and detailed specification of equipments. *as*

7-2. Recipient Side ensures the following work and cost.

-In case of necessity of minor renovation for installing medical equipment, the Royal Government of Cambodia ensures work and cost.

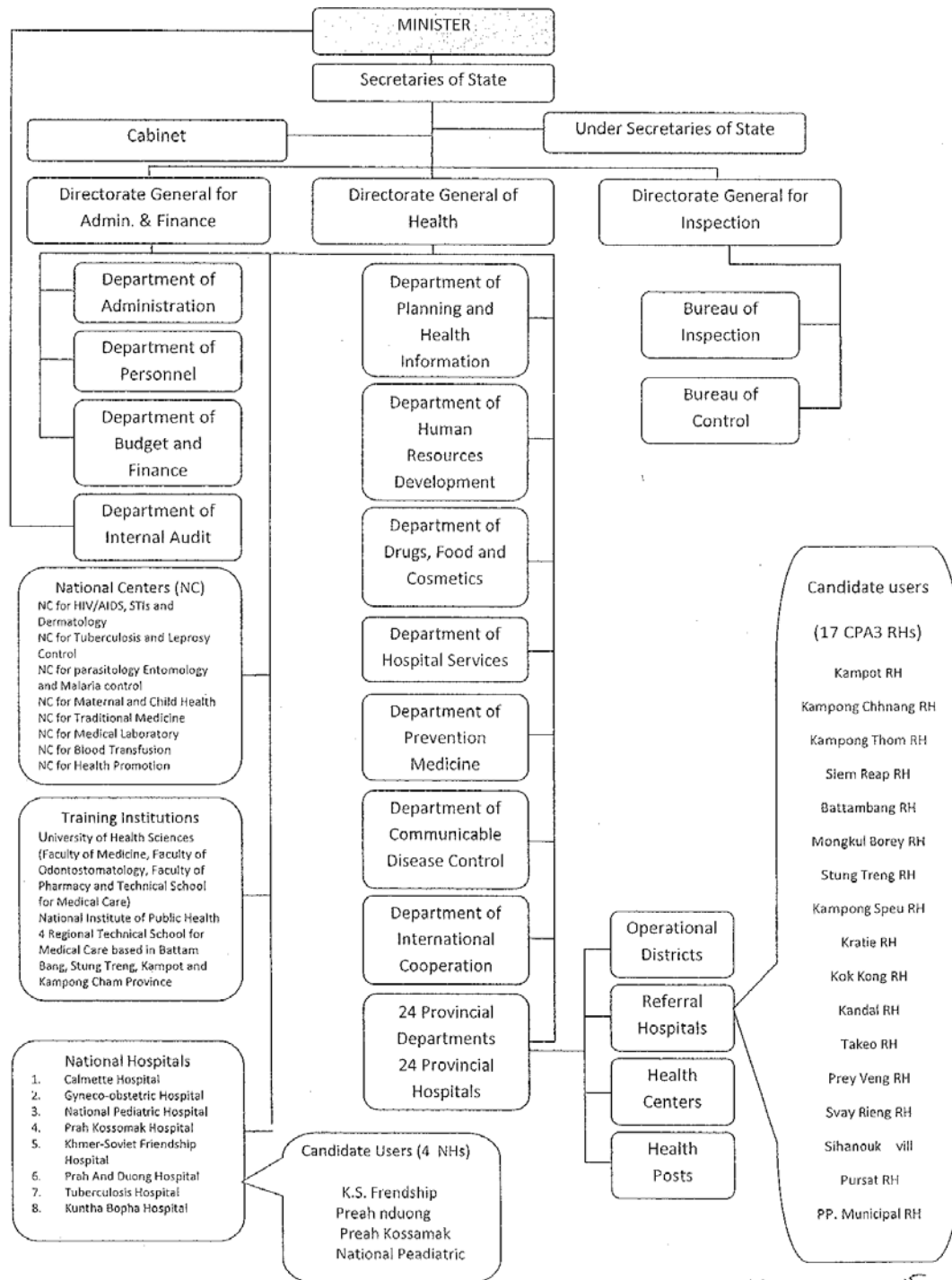
-The Royal Government of Cambodia ensures the adequate condition of electricity for running equipment.

Annex-1	Location Map for the hospitals to be surveyed for provision of equipment
Annex-2	Organization Chart of the Ministry of Health and hospitals to be surveyed
Annex-3	Final Requested Equipment List
Annex-4	Japan's Grant Aid
Annex-5	Major Undertakings to be Taken by Each Government
Annex-6	Tentative Schedule of the Project

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Organization Chart of the Ministry of Health



Final Requested Equipment List

S. No.	No.	Hospital	X-ray Machine				Ultrasound Machine	Patient Monitor
			X-ray Unit	General Automatic Film Processor or Computed Radiography Reader	X-ray Protective Prefabricated Room	X-ray Protective Set		
1	1	Kampot	1	1	1	1	1	6
2	2	Kampong Chhnang	1	1	1	1	2	5
3	3	Kampong Thom	1	1	-	1	2	10
4	4	Siem Reap	1	1	1	1	2	12
5	5	Battambang	1	1	-	1	1	6
6	6	Mongkul Borey	-	1	-	1	1	10
7	7	Stung Treng	1	1	-	1	2	3
8	8	Kampong Speu	-	1	-	1	1	5
9	9	Kratie	2	1	1	1	2	8
10	10	Kok Kong	1	1	-	1	2	4
11	11	Kandal	2	1	1	1	3	11
12	12	Takeo	-	1	-	1	1	7
13	13	Prey Veng	1	1	1	1	2	8
14	14	Svay Rieng	1	1	1	1	2	10
15	15	Sihanouk Vill	1	1	1	1	1	4
16	16	Pursat	1	1	-	1	2	3
17	17	PP. Municipal	1	1	1	1	2	10
18	1	K.S. Friendship	1	1	1	1	2	-
19	2	Preah Anduong	1	1	1	1	1	2
20	3	Preah Kossamak	-	1	-	-	1	19
21	4	National Padiatric	-	-	-	-	1	11
Total			18	20	11	19	34	154

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Japan's Grant Aid scheme

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of operations of the Official Development Assistance (ODA), and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

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

1. Grant Aid procedures


The Japan's Grant Aid is supplied through following procedures:

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project. 

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- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japan's Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

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

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as shown in the table of Annex 5 of this report. ↙

5. 5

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(6) "Proper Use"

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

(7) "Export and Re-export"

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

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA 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 JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines. *sk*

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Major Undertakings to be taken by Each Government

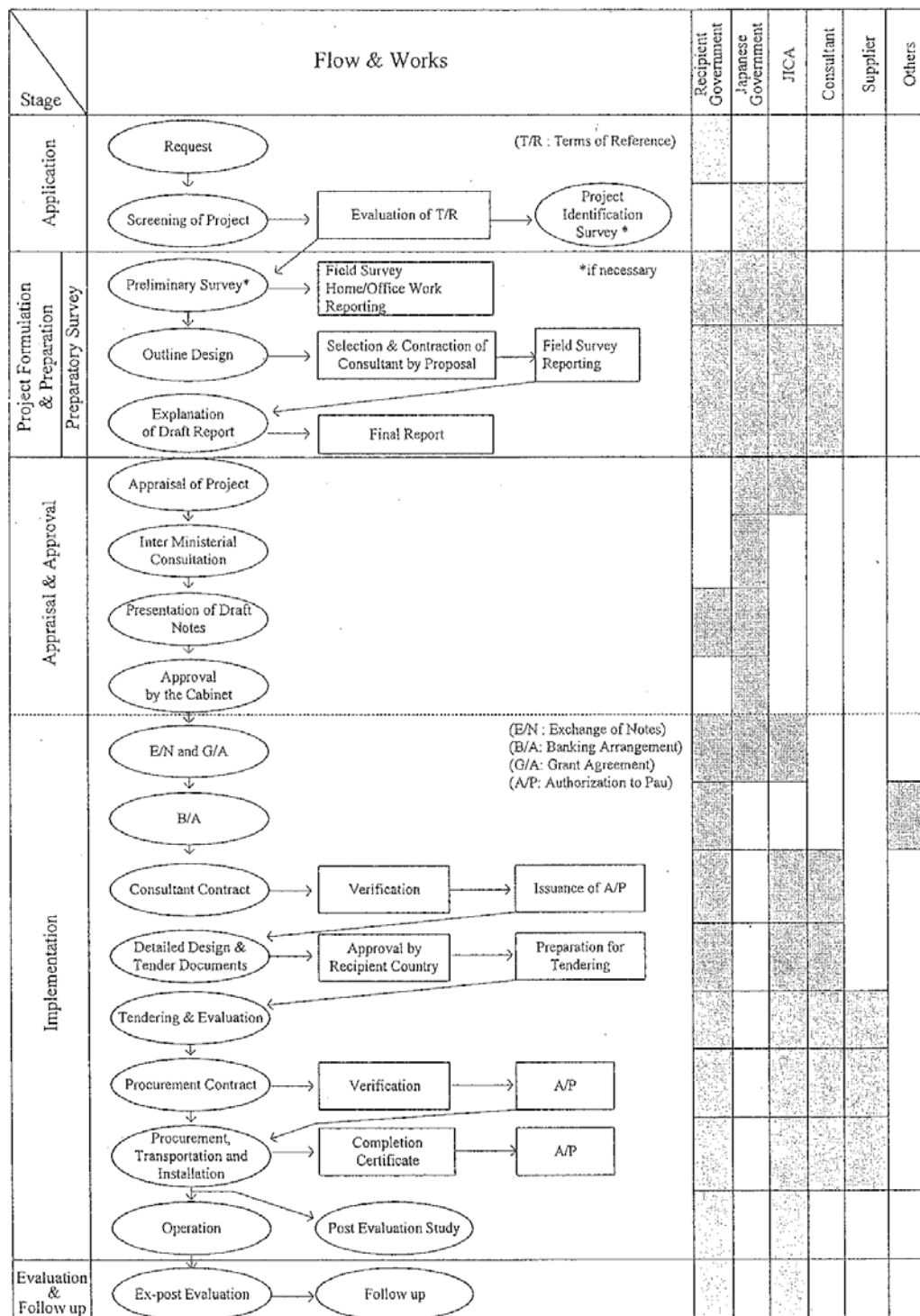
No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
2	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services [be exempted] or [be borne by the Authority without using the Grant]		●
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
4	To ensure that the products be maintained and used properly and effectively for the implementation of the Project		●
5	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
6	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●

(B/A : Banking Arrangement, A/P : Authorization to pay)


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Flow Chart of Japan's Grant Aid Procedure



56.



Schedule of Survey

The survey will be carried out as follows:

	2010 Oct.	Nov.	Dec.	2011 Jan.	Feb.	March
Preparation of survey in Japan	<input type="checkbox"/>					
Field Survey in Cambodia						
Analysis in Japan (Preparation of draft final report)						
Explanation of draft final report						
Preparation and submission of final report						△

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