The Kingdom of Bhutan
Ministry of Health

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR STRENGTHENING HEALTH CARE SERVICES IN EASTERN AREA IN THE KINGDOM OF BHUTAN

November 2022

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

International Techno Center Co., Ltd.

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Preface

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to International Techno Center Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Royal Government of Bhutan, and conducted a field investigations. As a result of further studies in Japan, the present report was finalized.

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

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

November, 2022

Jun Sakuma
Director General
Human Development Department
Japan International Cooperation Agency

Summary

Summary

1. Overview of the country

Bhutan is a landlocked country located in the southern part of the Himalaya Mountains with a huge difference in altitude from 300m to 7,000m, which causes the climate in the country to vary greatly. The population is approximately 770 thousand. According to World Bank statistics, Bhutan's GDP rose from 2.158 billion US dollars to 2.535 billion US dollars between 2016 and 2019, while GDP per capita continued to grow steadily from 2,930 US dollars to 3,322 US dollars. However, in 2020, due to the impact of COVID-19, the GDP was 2.315 billion US dollars, the GDP per capita was 3,000 US dollars, which was the level before 2017.

2. Background and outline of the requested assistance

Improving access to health care services is a key challenge for Bhutan, which has a rugged terrain, variable weather conditions, and widely dispersed population. Access to health care services has been improving by the efforts of the Royal Government of Bhutan (RGOB). However, depopulation in rural areas and the uneven distribution of medical resources among areas have manifested the disparities between urban and rural areas, especially in the eastern region of the country. In its Five-Year National Development Plan (2018-2023), RGOB states that development will be guided by the principles of leaving no one behind, reducing disparities, and ensuring equity and justice to realize a "just, harmonious, and sustainable society through enhanced decentralization." In the plan, the health sector is positioned as a priority area, with a policy that aims at achieving universal health coverage (UHC) by focusing on improving the level of and access to health care in rural areas. Under such circumstances, RGOB requested the government of Japan to extend a grant for the procurement of medical equipment in order to strengthen the health care services in the eastern region which is the farthest from the capital city and lag behind other regions in terms of health indicators.

3. Summary of the survey results and contents of the project

In response to the request by the government of Bhutan, the Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust to the consultant. The field survey and remote survey were conducted from July 2021 to November 2022. In the preparatory survey, the survey team visited target hospitals, the 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar(MCH), Eastern Regional Referral Hospital (ERRH), District hospitals, 10 bedded hospitals in the Mogar, Trashigang, Lhuentse and Trashiyangtse district to confirm the actual situation regarding medical equipment, facilities and the level of medical services. Due to COVID-19, entering to Pemagatsel and Samdrup Jongkhar were restricted, so an interview survey

was conducted with Ministry of Health.

Based on the results of the preparatory survey, the e medical equipment, mainly in the field of maternal and child health care will be procured for three target hospitals, total of 19 hospitals from primary to tertiary hospitals in the eastern region.

The following equipment shall be procured in the project, and a one-year warranty and four-year maintenance services for the radiological equipment shall be included for adequate maintenance.

Target hospital (Number)	Major equipment
MCH(1)	Digital X-ray machine, Infant warmer, Obstetric table, Infant incubator, Cardiotocography (CTG) monitor, Ultrasound machine, Defibrillator, Patient Monitor, Ventilator, Operating table, Operating light, Anesthesia machine, Laparoscopy set, Hysteroscopy set, Steam sterilizer, Coagulation analyzer, Biochemistry analyzer, etc.
ERRH(1)	Digital X-ray machine, etc.
District/General hospital (6)	Infant warmer, Obstetric table, Ultrasound machine, Defibrillator, etc.
10 bedded hospital (11)	Infant warmer, Obstetric table, etc.

4. Implementation period and project cost estimation

It is expected to take 11 months for bidding-related work and 11 months for procurement and installation of the equipment after conclusion of Grant Agreement (G/A). Since there is a four-year maintenance service period for radiology equipment after a one-year warranty period, the entire implementation schedule shall be completed in five years after the handing over of the equipment. The cost to be borne by the Bhutan side is approximate 1.9 million Bhutanese ngultrum (BTN).

5. Evaluation of the project

(1) Relevance

Improving access to health services is a top priority for Bhutan, which has a rugged terrain, variable weather conditions, and a widely dispersed population. In the current Five-Year National Development Plan, the health sector is positioned as a one of the priority area, with a policy that aims at achieving universal health coverage (UHC) by focusing on improving the level of and access to health care in rural areas. The project aims to strengthen medical services in eastern Bhutan, which is the furthest from the capital and lags behind other regions in terms of health

indicators, by providing the medical equipment needed to rectify the disparities in medical care among the regions of Bhutan. Based on the above, implementation of this plan is deemed to be highly appropriate.

(2) Effectiveness

Implementation of the project is expected to enhance maternal and child health care services in the eastern region of Bhutan by providing medical equipment, mainly for maternal and child health care, which will have the following effects.

1) Quantitative effects

Indicator	Baseline number (2020)	Target number (2027) [Three years after the Project's completion]
①Number of deliveries at cooperating facilities/year	1,923	2,250
②Number of ultrasound examinations/year at maternal and child health care hospitals and district hospitals in eastern Bhutan	7,996	9,500

2) Qualitative effects

①Improvement of comprehensive emergency obstetrics care and neonatal intensive care services

②Provision of quality medical care in the community and reduction of patient burden

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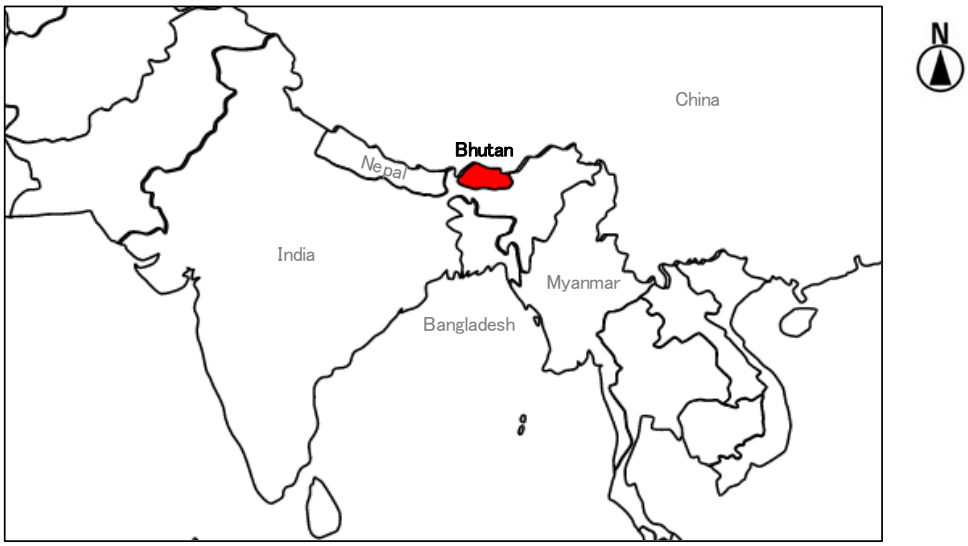
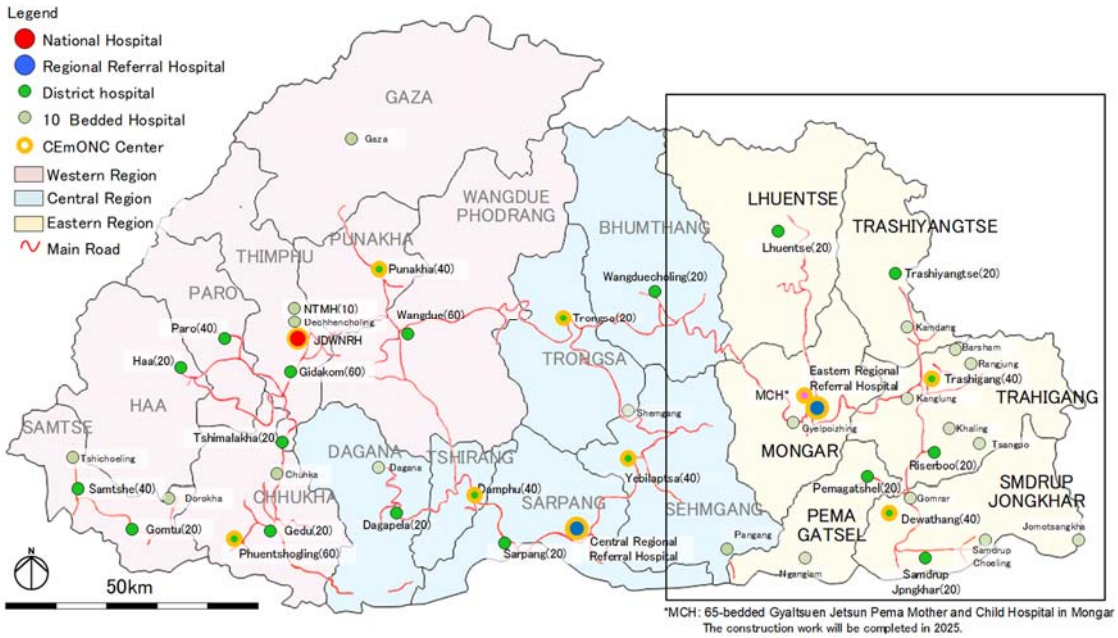
Appendices

Location map





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Abbreviations

A/P	Authorization to Pay
B/A	Banking Arrangement
BMED	Bio Medical Engineering Division
BTN	Bhutanese ngultrum
CHD	Community Health Department
DICOM	Digital Imaging and Communications in Medicine
E/N	Exchange of Note
ePIS	electric Patient Information System
ERRH	Eastern Regional Referral Hospital
G/A	Grant Agreement
GNHC	Gross National Happiness Commission
ICT	Information and Communications Technology
JICA	Japan International Cooperation Agency
MCH	65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar
MOF	Ministry of Finance
MOH	Ministry of Health
NICU	Neonatal Intensive Care Unit
PICU	Pediatric Intensive Care Unit
RGOB	Royal Government of Bhutan
UHC	Universal Health Coverage

Chapter 1 Background of the Project

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1-1 Background of the Project

Improving access to health care services is a key challenge for Bhutan, which has a rugged terrain, variable weather conditions, and widely dispersed population. Access to health care services has been improving due to the efforts of the Royal Government of Bhutan (RGOB) to develop facilities infrastructure and a network of health care services (Health Help Center) that utilize information and communications technology (ICT). However, depopulation in rural areas and the uneven distribution of medical resources among areas have manifested the disparities between urban and rural areas, especially in the eastern region of the country.

In its Five-Year National Development Plan (2018-2023), the Government of Bhutan states that development will be guided by the principles of leaving no one behind, reducing disparities, and ensuring equity and justice to realize a "just, harmonious, and sustainable society through enhanced decentralization." In the plan, the health sector is positioned as a priority area, with a policy that aims at achieving universal health coverage (UHC) by focusing on improving the level of and access to health care in rural areas. In the area of maternal and child health care, the government plans to improve maternal and child health care services in rural areas, including in the eastern region, by establishing an accelerated maternal and child health care policy.

The Project for Strengthening Health Care Services in the Eastern Area (hereinafter referred to as "the Project") will contribute greatly to the implementation of the current five-year plan. The Project targets the six eastern districts, which are the farthest from the capital city and lag behind other regions in terms of health indicators, and aims to strengthen their health care services by providing the necessary medical equipment for reducing the disparities in health care among the regions of Bhutan.

1-2 Natural Conditions

Bhutan is a landlocked country located in the southern part of the Himalaya Mountains with a huge difference in altitude from 300m to 7,000m, which causes the climate in the country to vary greatly. The below table shows altitudes of target districts.

Table 1 Altitudes of target districts

District	Altitude (Capital of the district)
Mongar	400～4,000m (1,600m)
Trashigang	600～4,500m (1,100m)
Trashiyangtse	500～5,400m (1,500m)
Lhuentse	600～5,800 (1,500m)
Pemagatsel	1,000～3,500m (1,200m)
Samdrup Jongkhar	200～3,600m (200m)

Source: Annual Dzongkhag Statistics 2020,National Statistics Bureau

Average temperatures and precipitation in target districts are shown in Table below. Precipitation increases throughout the whole country in the rainy season from June to September, and the lowest temperature sometimes drops below freezing and snow falls in winter from December to February.

In Bhutan, it takes a long time for an intercity transfer, because most of the roads are built along natural contours on the mountainsides, and the road conditions are not good, although road-widening and improvement works are ongoing throughout the whole country.

Table 2 Average temperatures and precipitations of target district

District		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mongar	Max. Temprature（℃）	18.3	20.2	23.0	23.7	26.4	28.0	28.2	28.4	26.8	25.6	21.9	18.3
	Min.Temprature（℃）	5.3	7.3	10.0	12.9	15.7	17.6	18.5	18.7	17.6	13.1	10.1	7.0
	Ave..Temprature（℃）	11.7	13.6	16.4	18.4	20.7	22.8	23.0	23.5	22.0	19.2	15.8	12.6
	Precipitation（mm）	5.6	9.0	37.7	84.4	99.3	119.0	216.0	150.0	142.1	50.6	3.3	4.9
Trashigang	Max. Temprature（℃）	18.6	20.5	23.6	25.8	26.9	28.6	28.3	28.3	27.5	26.1	22.6	19.3
	Min.Temprature（℃）	2.5	4.4	7.1	9.7	12.4	15.0	15.8	15.8	14.6	10.5	7.1	4.0
	Ave..Temprature（℃）	10.6	12.3	15.3	17.8	19.5	22.0	21.9	22.0	21.0	18.3	14.7	11.6
	Precipitation（mm）	9.0	23.1	48.6	91.3	131.7	171.8	244.2	179.3	137.8	38.9	2.5	5.3
Trashiyangtse	Max. Temprature（℃）	16.8	18.9	21.9	22.9	24.3	26.1	26.3	26.8	25.6	24.2	20.7	18.0
	Min.Temprature（℃）	-0.4	2.9	5.2	8.2	11.2	15.1	16.5	16.5	15.3	8.5	4.8	1.2
	Ave..Temprature（℃）	8.2	10.8	13.2	15.7	17.6	20.7	21.1	21.7	20.4	16.5	12.8	9.6
	Precipitation（mm）	8.2	13.2	51.5	131.9	164.9	126.0	222.1	214.5	186.5	52.0	6.4	7.8
Lhuentse	Max. Temprature（℃）	17.7	18.8	23.8	25.6	27.5	29.3	29.3	29.4	27.4	26.9	21.9	19.0
	Min.Temprature（℃）	7.3	9.6	12.8	14.8	18.5	20.4	21.9	21.9	19.8	15.2	12.6	9.8
	Ave..Temprature（℃）	12.5	14.6	18.8	20.6	23.3	25.5	25.5	25.8	24.2	21.4	17.2	14.4
	Precipitation（mm）	8.2	16.0	25.0	43.8	87.7	178.7	140.6	176.7	112.0	24.2	5.3	1.1
Pemagatsel	Max. Temprature（℃）	16.3	18.5	21.3	22.3	23.9	25.3	25.0	25.3	25.0	24.1	21.2	18.0
	Min.Temprature（℃）	4.2	6.5	9.3	12.1	15.0	17.3	18.3	18.3	17.3	12.5	8.4	6.0
	Ave..Temprature（℃）	10.3	12.2	15.1	17.2	19.3	21.2	21.4	21.6	21.0	18.5	13.5	11.8
	Precipitation（mm）	7.3	19.4	54.6	109.7	146.6	286.9	318.1	272.6	249.7	35.0	3.6	3.0
Samdrup Jongkhar	Max. Temprature（℃）	21.4	22.6	24.4	25.4	25.4	27.0	27.6	27.9	26.3	25.1	23.0	10.1
	Min.Temprature（℃）	9.6	10.4	13.1	15.7	19.3	21.1	22.4	22.1	21.2	18.6	15.7	12.9
	Ave..Temprature（℃）	15.5	16.5	18.7	20.6	21.3	23.3	24.1	24.0	22.8	20.9	18.1	15.4
	Precipitation（mm）	11.2	34.4	104.7	277.9	389.5	820.9	740.3	553.7	533.5	113.0	14.5	3.2

Source: Annual Dzongkhag Statistics 2020,National Statistics Bureau

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

Access to health care services has been improving by efforts of the RGOB's efforts as mentioned above. However, depopulation in rural areas and the uneven distribution of medical resources among areas have manifested the disparities between urban and rural areas, especially in the eastern region. of the country. Maternal and child health indicators in the eastern region, where the infant mortality rate is 17.6 (per 1,000 live births) and the under-five mortality rate is 48.5 (per 1,000 live births), are worse than in the western region, where the capital city of Thimphu is located, (at 14.3 and 29.7, respectively) and the central region (at 17.5 and 36.0, respectively). Strengthening maternal and child health care services is therefore an urgent matter.

The health sector is positioned as a priority area in the Five-Year National Development Plan (2018-2023), with a policy that aims at achieving universal health coverage (UHC) by focusing on improving the level of and access to health care in rural areas. In the area of maternal and child health care, the government plans to improve maternal and child health care services in rural areas, including in the eastern region, by establishing an accelerated maternal and child health care policy.

The Project is positioned as an important project of the RGOB, as it will contribute to the accelerating the UHC by strengthening the medical services through the provision of medical equipment, mainly field of the maternal and child health to the 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar (MCH) and other 18 hospitals in the eastern region.

2-2 Outline Design of Japanese Assistance

2-2-1 Design Policy

(1) Basic Policy

The medical equipment which is necessary to provide health care services for mothers and children shall be procured for several health facilities in the eastern region in the project, thereby contributing to the strengthening of the health care services and promotion of UHC in Bhutan.

(2) Policy on Natural Environment Conditions

The elevation of the main cities in each district in the eastern region is 1,600m in Mongar, 1,100m in Trashigang, 1,500m in Trashiyangtse, 1,500m in Lhuentse, 1,200m in Pemagatsel, and 200m in Samdrup Jongkhar. There are concerns that in facilities located at high elevations, the cooking effect of radiation tube spheres may decrease and that changes in atmospheric pressure may cause the boiling point of water to drop, thereby lowering the working efficiency of steam sterilizers, etc. During the rainy season from June to September, flooding and landslides

frequently occur due to increased precipitation throughout the country. Particularly in the eastern region, there are many highways that are under construction. Therefore, the timing of transportation of procured equipment should not only be avoided during the rainy season, but should also be carefully considered in light of road conditions during transportation.

(3) Policy on Socio-Economic Conditions

While stable economic growth has been achieved, disparities between urban and rural areas has been revealed, and disparities in access to health care services are also seen in rural and urban areas. The percentage of residents with access to health care facilities within one hour is 98.6% in urban areas and 72.0% in rural areas. Even in rural areas, access to well-developed roads remains a challenge. Furthermore, many rural residents do not have the financial means to secure transportation. This is particularly noticeable in the eastern region with a high percentage of rural residents. Thus, the project plans equipment with an emphasis on improving access to equitable and quality medical services in the eastern region.

(4) Policy on Procurement

Equipment to be procured will be basically from Japanese manufacturers having local agents in Bhutan or neighboring countries. However, third-country products will also be considered in consideration of the procurement situation in Bhutan and competitiveness at the time of bidding.

(5) Policy on Determination of Grades and Specifications of Equipment

The grades and specifications of the equipment to be procured shall be determined referring to the equipment currently used in Bhutan and neighboring countries where Bhutanese health staff go for training. From the viewpoint of telemedicine services, DICOM (Digital Imaging and Communications in Medicine) specifications will be considered for diagnostic imaging equipment (X-ray machines, ultrasound machines, etc.) among the equipment to be compatible with ePIS (electric Patient Information System), which the Ministry of Health (MOH) in Bhutan aims to introduce in 2023.

(6) Policy on Consumables and Spare parts

Since local agents for medical equipment are limited, consumables for newly procured equipment must be procured from neighboring countries such as India. Therefore, it takes a certain period to establish a procurement route. To assure the smooth start of operation after the installation of equipment, minimal consumables required for an initial period or one to three months shall be included. Replacement of spare parts shall be included as part of the maintenance services only for equipment covered by maintenance contracts.

(7) Policy on Operation and Maintenance

Human resource for the 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar (MCH), which is expected to be completed in August 2024, will be transferred from the maternal and child health-related departments of Eastern Regional Referral Hospital (ERRH). Although there is a need to increase the number of staff to support the expanded functions of the hospital and to manage the hospital, the necessary staff will be requited under the supervision of MoH. Aside from MCH, other target facilities have the required staff already in place.

In Bhutan, great importance is attached to the sustainable use of medical equipment, and a five-year comprehensive maintenance contract is required according to the guidelines of MOH for equipment that costs more than 10 million Bhutanese ngultrum (BTN) or any other equipment that is indispensable for medical services in the country. Considering such importance, a four-year maintenance contract in addition to a one-year warranty shall be included for digital X-ray machines in the project. This equipment shall be procured from manufacturers that have an agent located in Bhutan or India.

(8) Policy on Operation Guidance

In accordance with Japan’s grant aid scheme, the products of Japan and/or Bhutan shall be procured in principle. And the equipment will be mainly Japanese products with which the health staff in Bhutan may not be familiar. The equipment plan should be developed with reference to the specifications and grades of equipment that have been used in the past and existing equipment. Since the features of equipment and the layout of operation panels may differ from each other. It is necessary to ensure that the operation procedures and daily maintenance are properly carried out. Accordingly, in order to ensure that medical personnel at the facilities in question can properly handle the procured equipment, a sufficient time shall be set aside at the time of installation to provide them with operational training.

(9) Policy on Soft Component

In order to ensure that equipment to be procured remains in good condition over the long term, training on the proper use and maintenance of the medical equipment shall be included in the project under the framework of the soft component in Japan's grant aid.

(10) Policy on Project Schedule

Procurement of the equipment shall be completed approximately 22 months after the conclusion of the Exchange of Note (E/N) and Grant Agreement (G/A). The procurement of equipment shall be planned to coincide with the completion of the building of MCH in which the main equipment shall be procured. The entire period of the project will be some 60 months, including a one-year warranty and four-year maintenance contract.

2-2-2 Basic Plan

(1) Overall plan

The objective of the Project is to improve health care services through the provision of medical equipment, which is necessary to provide health care services for mothers and children in several medical facilities in the eastern region. The target health facilities are as follows:

1) 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar (MCH)

2) Health facilities in eastern region

① Eastern Regional Referral Hospital, Mongar (ERRH)	1 facility
② District/General Hospital	6 facilities
③ 10 bedded hospitals	11 facilities

MCH, the main procurement site, is being constructed by RGOB, with completion scheduled for August 2024. The procurement of equipment shall be carried out upon confirmation of the progress of construction work of MCH. Furthermore, procurement of equipment for other facilities shall be carried out with the same schedule as MCH.

(2) Equipment plan

1) 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar (MCH)

RGOB initially requested 110 items. Subsequently, items were prioritized and identified as those items that could be procured by RGOB. The following table shows the final requested items.

Table 3 Confirmed requested equipment list for MCH

No	Sl. No.	Name of equipment	Pediatric (NICU/PICU)	OBS/GYN	CHD	ER	Radiology	Operating Room	CSSD	Laboratory	Pharmacy	Total	Priority
1	M1	Infant Incubator	2	1								3	A
2	M2	Infant warmer A	4	2		1		1				8	A
3	M3	Infant warmer B	5	1	1	1						8	A
4	M4	Bubble CPAP	6	1								7	A
5	M5	High flow system	4									4	A
6	M6	Patient Monitor A	10	5		1						16	A
7	M7	Patient Monitor B	9	5	1	1						16	A
8	M8	Patient Monitor C						3				3	A
9	M9	Syringe pump	20	2		4		1				27	A
10	M10	Infusion pump	18	7		4		1				30	A
11	M11	Ventilator A	3									3	A
12	M12	Ventilator B	3			1						4	A

13	M13	Transport incubator	1	2		2						5	A
14	M14	Transport Ventilator	0			1						1	A
15	M15	Infant Resuscitator	2	2		1						5	A
16	M16	Phototherapy unit	5	4								9	A
17	M17	Ultrasonic Nebulizer Machine	4	1	2	2						9	A
18	M18	ECG Machine	1		1	1						3	A
19	M19	Patient bed (ICU)	6									6	A
20	M20	Defibrillator	2	1		1		1				5	A
21	M21	Blood gas analyzer	1			1						2	A
22		Treadmill	1									1	B
23	M22	Examination Light	4	2		1						7	A
24	M23	Examination table	2	2	2	1	1					8	A
25	M24	Delivery light		2								2	A
26	M25	Obstetric table		2	2							4	A
27	M26	Gynecological examination table		1	2	1						4	A
28	M27	Cardiotocography (CTG) monitor		7	2	1						10	A
29	M28	Video colposcopy			1							1	A
30	M29	LEEP Machine			1			1				2	A
31		Diathermy treatment system		1								1	B
32		TENS machine		1								1	B
33		Therapeutic ultrasound system		1								1	B
34	M30	Vacuum Extractor		2								2	A
35	M31	Suction unit	2	2		1		4				9	A
36	M32	Digital X-ray machine					1					1	A
37	M33	X-ray film processor					1					1	A
38	M34	Portable X-ray machine					1					1	A
39	M35	Ultrasound machine A					2					2	A
40	M36	Ultrasound machine B					1					1	A
41	M37	Ultrasound machine C						1				1	A
42	M38	Portable ultrasound machine		1			1					2	A
43	M39	Operating light						3				3	A
44	M40	Operating table						3				3	A
45	M41	Electrosurgical unit						3				3	A
46	M42	Anesthesia machine						2				2	A
47	M43	Laparoscopy set						1				1	A
48	M44	Hysteroscopy set						1				1	A
49	M45	Video laryngoscope				1		1				2	A
50	M46	Steam sterilizer							2			2	A
51	M47	Plasma sterilizer							1			1	A
52	M48	Surgical instrument washer							1			1	A
53	M49	Ion-selective analyzer								1		1	A
54	M50	Distillation unit								2		2	A
55		Dry bath incubator								3		3	B
56	M51	Biochemistry analyzer								2		2	A
57		Barcode tube labelling system								2		2	B
58	M52	Centrifuge A								4		4	A
59	M53	Centrifuge B								1		1	A
60	M54	Microscope								3		3	A
61	M55	Refrigerator A								4		4	A
62	M56	Refrigerator B									5	5	A
63	M57	Freezer								2		2	A
64	M58	Blood refrigerator								1		1	A

65		Cell washer								1		1	B
66	M59	Hematology analyzer								2		2	A
67	M60	Coagulation analyzer								1		1	A
68		Vortex mixer								1		1	B

Priority A: To be procured by the Project/ Priority: To be considered to be procured by RGOB

2) Health facilities in eastern region

Initially, 15 facilities were targeted, and through discussions with MoH, it was decided that 18 facilities would be included in the project. Note that Deothang Hospital in Samdrup Jongkhar district would be excluded since it is a military hospital.

Table 4 Target facilities and amount of equipment

District	Name of facility	No. of Beds	2021 November	2021 December	2022 August
Mongar	① ERRH	(150)	30	6	1
	② Gyalposhing 10BH	(10)	-	3	3
Trashigang	③ Trashigang DH	(40)	17	6	6
	④ Riserboo GH	(20)	11	3	3
	⑤ Kanglung 10BH	(10)	5	3	3
	⑥ Bartsham 10BH	(10)	1	3	3
	⑦ Rangjung 10BH	(10)	10	3	3
	⑧ Khaling 10BH	(10)	5	3	3
	⑨ Tsangpo 10BH	(10)	-	3	3
Trashiyangtse	⑩ Trashiyangtse DH	(20)	6	3	3
	⑪ Khamdang 10BH	(10)	7	3	3
Lhuentse	⑫ Lhuentse DH	(20)	14	3	3
Pemagatsel	⑬ Pemagatsel DH	(20)	7	4	4
	⑭ Nganglam 10BH	(10)	2	3	3
Samdrup Jongkhar	⑮ Samdrup Jongkhar DH	(20)	3	3	3
	Deothang Hospital	(40)	8	0	0
	⑯ Gomdar 10BH	(10)	3	3	3
	⑰ Jomotshangkha 10BH	(10)	-	3	3
	⑱ Samdrupcholing 10BH	(10)	-	3	3
	Target facilities		15	18	18

ERRH: Eastern Regional Referral Hospital, DH: District Hospital, GH: General Hospital, 10BH: 10 Bedded Hospital

The initial request was for about 60 items for 15 facilities. The request included not only maternal and child health-related equipment but also dental, ophthalmology, clinical laboratory, physiotherapy and others for providing necessary medical care at each health facility based on the service delivery standard of MoH. The equipment to be procured was selected with a focus on that which contributes to strengthening the maternal and child health service from the initial equipment list. The confirmed list is shown in the below table.

Table 5 Confirmed requested equipment list for health facilities in eastern region

No.	Sl. No.	Name of Equipment	M		Tg							Ty		L	P		SJ				Total	Priority
			ERRH	Gyalposhing 10BH	Trashigang DH	Riserboo GH	Kanglung 10BH	Bartsham 10BH	Rangjung 10BH	Khaling 10BH	Tsangpo 10BH	Tashiyangtse DH	Khamdang 10BH	Lhuentse DH	Pemagatshel DH	Nganglam 10BH	SamdrupJongkhar DH	Gomdar 10BH	Jomotshangkha 10BH	Samdrupcholing 10BH		
1	E1	Cardiotocography			2																2	A
2	E2	Defibrillator			2	1						1		1	1		1				7	A
3	E3	Ultrasound machine A			1							1		1	1		1				5	A
4	E4	Digital X-ray machine	1																		1	A
5	E5	X-ray film processor	1																		1	A
6	E6	Obstetric table		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	16	A
7	E7	Infant warmer A		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	A
8	E8	Steam sterilizer			1																1	A

*M:Mongar District,Ts : Trashigang District,Ty : Tashiyangtse District,L : Lhuentse Distrct, SJ : SamdrupJpngkhar District, P : Pemagatshel district

** ERRH:Eastern Regional Referral Hospital,DH: District Hospital, GH:General Hospital, 10bed: 10 bedded Hospital

(2) Outline specifications

Since MCH will be positioned as the top referral hospital for maternal and child health in the eastern region, the quantity and specification of equipment to meet its functions shall be considered. With respect to existing health facilities in the eastern region, equipment related to antenatal care and delivery shall be procured to provide high-quality health services closer to the people in the area. Furthermore, the consumables for several months of initial operation shall be included.

Table 6 Outline specifications for major equipment

No.	Equipment name	Outline Specifications	Q'ty
M1	Incubator	Model: Stationary incubator. Control method: Manual/servo control method. Humidity and body temperature control function: Equipped. Access Windows: 2 on front and back. Cart: Casters, with accessory case.	3
M2	Infant Warmer A	Model: Stationary type. Control method: Manual/servo control method. Humidity and body temperature control function: Equipped. Resuscitation unit: Equipped.	8
M3 E7	Infant Warmer B	Model: Stationary type. Control method: Manual/servo control method. Humidity and body temperature control function: Equipped.	24
M6	Patient Monitor A	Display: Color LCD 10.2 inches. Measurement items: ECG, Respiration, SpO_2, NIBP, Temperature, IBP, CO_2. Waveform display: 4 or more waveforms. Battery: 1 hour or more. Printer/trolley: Equipped.	16
M7	Patient monitor B	Display: Color LCD 10.2 inches. Measurement items: ECG, Respiration, SpO_2, NIBP, Temperature, IBP, CO_2. Waveform display: 4 or more waveforms. Battery: 1 hour or more. Printer/trolley: Equipped.	16
M8	Patient Monitor C	Display: Color LCD 10.2 inches. Measurement items: ECG, Respiration, SpO_2, NIBP, Temperature, IBP, CO_2. Waveform display: 4 or more waveforms.	3

		Battery: 1 hour or more, Printer/trolley included	
M11	Ventilator A (for neonates,)	Modes: VCV, PCV, VC-SIMV, PC-SIMV, CPAP/PSV. Ventilation volume control range: Neonatal/pediatric 20-301ml. Breathing frequency: 1-101 times. Inspiratory time: 0.20 to 10.01 seconds. Oxygen concentration: 21 to 101%. Alarm/Cart/Compressor: Equipped.	3
M12	Ventilator B (for adults and children)	Ventilation mode: VCV, PCV, VC-SIMV, PC-SIMV, CPAP/PSV. Ventilation volume control range: 100 to 2,001 mL for adults, 20 to 301 mL for children. Respiratory rate: 1 up to 101 times. Inspiratory time: 0.20 to 10.01 seconds. Oxygen concentration: 21 to 101%. Alarm/Cart: Equipped.	4
M13	Transport incubator	Model: Portable. Control method: Manual/servo control method. Body temperature setting range: 34.0-37.5°C. Internal temperature display: 20.0-42.0°C. Pulse oximeter: Equipped, display range 0-100%. Alarm: Equipped.	5
M14	Transport ventilator	Ventilation mode: VCV, PCV, VC-SIMV, PC-SIMV, CPAP/PSV, Ventilation volume control range: Adult: 100-2,001mL, Pediatric: 20-301ml. Breathing frequency: 1-101 times, PEEP: 0 to 20 cmH3O, Inspiratory time: 0.20 to 10.01 seconds. Oxygen concentration: 21 to 101%, Alarm, battery, mask, cart: Equipped.	1
M18	Electrocardiograph	Electrode: 12 leads. Recording speed: 5, 10, 12.5, 25, 50 mm/s. Display: 8-inch, Color LCD, Printer: Built-in, Paper width: 210 mm. Battery: Equipped.	3
M20 E2	Defibrillator	Energy selection: 3 - 270 J. Charging time: Within 200J-6 seconds. Discharge type: Synchronous and asynchronous. Display: 6.6 inches, LCD color. Recording speed: 26 mm/sec. and 50 mm/sec. Alarm: Attached. Cart: Attached.	12
M21	Blood gas analyzer	Measurement items: 17 items including pH, pCO_2, pO_2, cK+, cNa+, cCa2+, cCl-, cGlu. Measurement time: Within 50 seconds, sample volume: 90 µL or less. Sample dispensing method: Automatic aspiration. Operation/result display: LCD panel, printable.	2
M32 E4	Digital X-ray system for general radiography	Tube voltage/current: 40-150 kV/10-500mA. X-ray table size, Maximum load: 1,800 x 450mm/160kg or more. FPD: Equipped 17 x 14 inch. Screen display monitor: 17-inch LCD, color. DICOM Standard software: Equipped. Radiation protection apron: Attached. UPS: Attached.	2
M33 E5	X-ray film processor	Printing method: Laser, Thermal transfer. Film size: 14 x 17, 14 × 14, 10 × 14. Throughput: 110 image/hr. Pixel size: 50/100µm. Exposure resolution: 14bits. Interface: DICOM. Storage capacity: 1 GB. Operation: Touch panel.	2
M34	Portable X-ray machine	Rated Power: 2.5-32kW. Tube Voltage/Current 40-135 kV / 0.32 - 400mA, FPD: Attached, S, M, L. Radiation Protection Apron: Attached, S, M, L.	1
M35 E3	Ultrasound machine A	Monitor: LCD, 21.5 inches, Color. Scanning method: Linear/Convex/Sector. Scanning mode: B, M, Color Doppler mode. DICOM, Battery, Printer: Attached.	7

		Probe A: Convex 2-7.5Mhz, B: Linear, 2.5-12Mhz, C: Sector, 2-7.5Mhz, D: Single type, 2-22Mhz.	
M36	Ultrasound machine B	Monitor: LCD, 15 inches, Color. Scanning method: Linear, Convex, Sector. Scanning mode: B, M, Color Doppler mode. DICOM, Battery, Printer: Attached. Probe A: Convex type, 2-5Mhz, B: Linear type, 6-15Mhz.	1
M37	Ultrasound machine C	Monitor: LCD, 15 inches, color. Scanning method: Linear, convex, sector. Scanning mode: B, M, color Doppler mode. DICOM, Battery, Printer: Attached. Probe A: Convex type, 2-5Mhz, B: Linear type, 6-15Mhz	1
M38	Portable ultrasound machine	Monitor: LCD, 15 inches, color. Scanning method: Linear, convex, sector. Scanning mode: B, M, color Doppler mode. DICOM, Battery, Printer: Attached. Probe: A high speed linear, 6-18MHz, B: Hockey stick type, 3.5-16MHz.	2
M39	Operating lamp	Model: Ceiling mount and combination type. Light body diameter: Main light 750mm, Sub light 550mm. Number of lamp devices: Main 120 pcs, Sub 70pcs or more. Light field diameter adjustment: Adjustable. Center illuminance main/sub: Min. 60,000 Lux.	3
M40	Operating table	Elevation method: Electro-hydraulic. Elevation range 70-98 cm. Table size 480 x 1,850 mm, weight: 180 kg.	3
M42	Anesthesia machine	Types of gas: Oxygen, laughing gas, Air. Usable anesthetics: Isoflurane. CO_2 adsorption chamber: Equipped. Alarm device: Equipped. Ventilator for anesthesia machine: Equipped.	2
M43	Laparoscope	Light source video system: Equipped, Halogen lamp. LCD monitor: 18 inches. Inflater: CO_2 gas use. Cart: Attached	1
M44	Hysteroscope	Light source video system: Equipped, Halogen lamp. LCD monitor: 18 inches. Inflater: CO_2 gas use. Cart: Attachment.	1
M46 E8	Autoclave sterilizer	Type: Stationary, horizontal, single door, capacity 250L. Sterilization temperature range: 121-132°C Variable. Chamber material: SUS304, Boiler: Built-in.	3
M47	Plasma sterilizer	Chamber shape and capacity: Square, 125L. Control method: Microprocessor control. Processing temperature: 55°C. HEPA filter: 99.99% 0.3μ	1
M48	Surgical instrument washing machine	Capacity: 8 or more DIN trays. Type: single door, manual type. Inner cylinder material SUS 304. Number of shelves: 4 or more	1
M49	Electrolyte Analyzer	Sample types: whole blood, serum, plasma, diluted urine, dialysate, ISE-CRS. Sample volume: 110uL (500uL dialysate), throughput: about 120/hour, about 34 seconds per sample. Test number of pieces: 30. Display/operation: 5.0 inch. LCD/touch panel.	1
M57	Freezer	Capacity: 350-450L, Cooling performance: -15 to -40°C, Temperature display: Digital display, Alarm function: Included, Door: 2 pieces.	2
M60	Blood coagulation analyzer	Measurement items: PT, FIB, PTR, INR, APT, TT, Protein C and S. Processing capacity: 180test/H, PTT, APTT: 115test/H, Aspirate. Sample volume: 5-50μl, Specimen memory capacity: 10,000 specimens Printer: Equipped.	1

Table 7 List of consumables

Equipment	Qty	Items	Unit Price (YEN)	Quantity	Amont (YEN)
Patient monitor	35	Electrode (150pcs)	10,950	35	383,250
Electrocardiograph	3	Recording paper (100m)	4,115	3	12,345
Ultrasound machine	7	Recording paper (20m)	2,375	7	16,625
		Gel (250g)	1,040	14	14,560
Cardiotocography monitor	12	Gel (250g)	1,040	22	22,880
		Recording paper (100m)	2,375	22	52,250
Syringe pump	27	Syringe (20ml) (100pcs)	3,150	27	85,050
		Syringe (50ml) (25pcs)	3,120	27	84,240
Infusion pump	30	Infusion tube (50pcs)	8,400	30	252,000
X-ray film processor	2	Dry film (100pcs)	9,065	2	18,130
Microscope	3	Immersion oil (30ml)	10,163	3	30,489
				Total	971,819

The monthly cost for consumables is approximately 972 thousand yen = 631 thousand BTN（Exchange rate: 1.00BTN = 1.54 YEN）

(4) Facility development plan for equipment installation

When installing large equipment such as radiation equipment and steam sterilizers, it is necessary to provide space, power supply, air conditioning, and sanitary facilities essential for operation as well as radiation protection for the rooms where the equipment will be installed. Since lead glass for radiation protection is difficult to find in Bhutan, Japanese products will be procured under this project. The Bhutan side handles the procurement of other construction materials and facility maintenance associated with the installation of equipment.

2-2-3 Facility Development Plan

The main large equipment to be procured under this plan and the facilities to be developed for the installation of the equipment are as follows:

(1) 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar (MCH)

This facility is a new building scheduled for completion around August 2024, and the drawings shown in Figures 2-1 to 2-5 are the design documents obtained from the Bhutanese side in October 2021. The building layout consists of CHD (Community Health Department) BLOCK, which will be renovated, the existing royal palace's guest house, and the other four buildings, i.e., BLOCK 1 through BLOCK 3. The room where the general digital X-ray system will be installed is located on the ground floor of BLOCK 2 in the Radiation Department. The room for the steam sterilizer is located on the first basement floor of BLOCK 3 in the Central Materials Department. Both rooms are accessible by a ramp to the basement, which is also accessible to vehicles and there is no problem with the access to bring in equipment from outside.

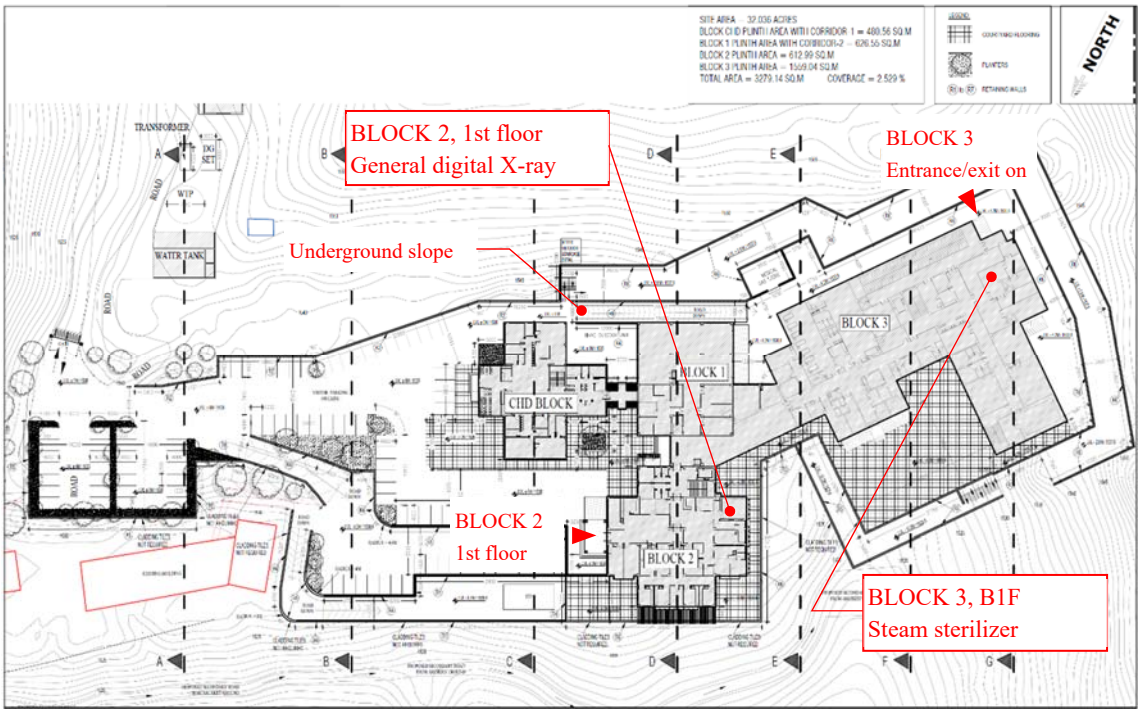


Figure 1 Facility layout (MCH)

- General digital X-ray machine

The X-ray room is located on the ground floor of BLOCK 2 in the Radiology Department. Since it is located on the ground floor, the layout of corridors and width of doors allow the equipment to be carried in without any problem.

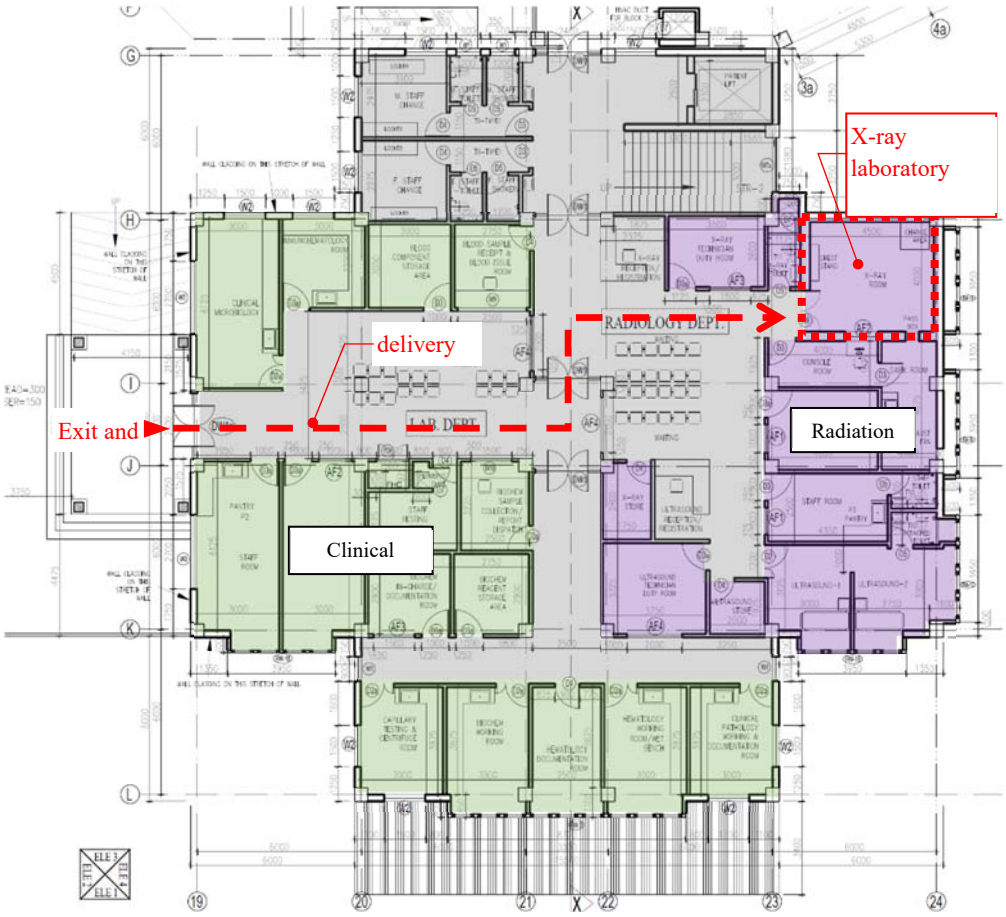


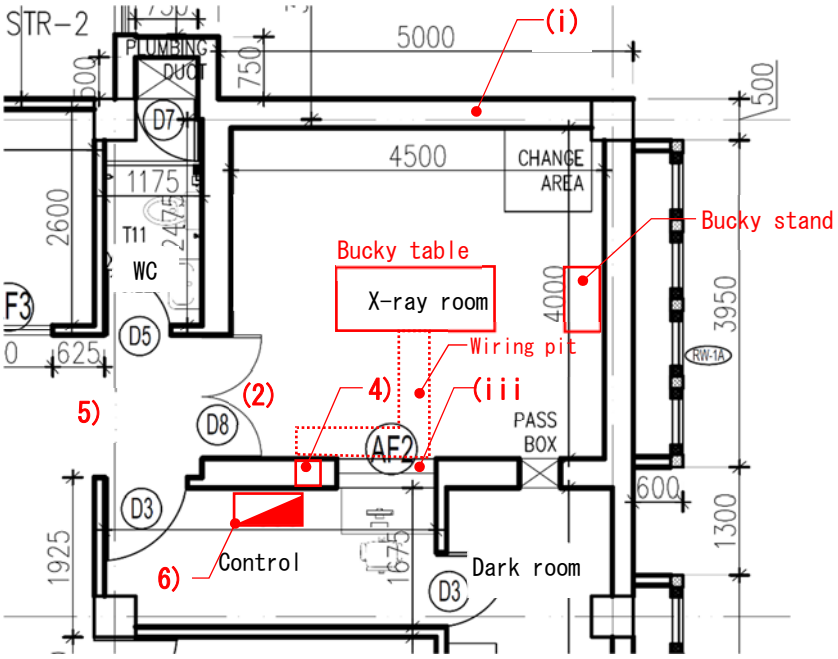
Figure 2 BLOCK 2 1st floor plan (MCH)

However, the following items have not been confirmed in the design documents as of September 2022 due to under modification in progress which are prerequisites for the installation of the requested equipment.

- Radiation protection of doors, windows, and other openings (including frames)
- Availability of cable openings and wiring pits for wiring to the equipment concerned
- Specifications of power supply and grounding terminals
- Temperature and humidity environment with a cooling system

Note: Since the equipment to be installed is a digital X-ray machine, a darkroom and pass box are not required. From the viewpoint of radiation protection, unnecessary openings should be discontinued.

Installation of the requested equipment shall be performed after confirming that the construction status meets the above conditions. The following are the required specifications and plans of the facilities necessary for equipment installation.



Red letters and red lines indicate the assumed equipment installation locations added to the design drawings.

Facility Requirements

No.	Item	Technical Specification
(1)	Chamber structure	The walls shall be coated with brick/mortar at least 25 cm thick, or a thickness in accordance with local regulations, and the upper floor slab shall have a concrete thickness of 15 cm or equivalent radiation shielding measures. The ceiling height shall be 2,350 - 2,900 mm.
(2)	Radiation shield door	Doors for entrances and exits shall be lead-lined with a minimum of 2.0 mm for both frames and doors, with an effective width of 1.4 m and an effective height of 2.1 m or more.
(3)	Control window	Radiation shielding glass with a lead equivalent of 2.0 mm or more must be inserted, and window frames must be protected with lead plates of 2.0 mm or more.
(4)	Cable opening	An opening W200 x H150 for cable penetration shall be provided in the partition wall between the radiography room and the console room, and both sides of the opening shall be protected with lead plates 2.0 mm or more. If the cables to the X-ray system intersect with the user's line of flow, a wiring pit should be provided between the X-ray system and the console room.
(5)	Delivery route	Doors and corridors from the ground level entrance of the building to the room shall have an effective width of 1.4 m and an effective height of 2.1 m or more.
(6)	Power supply	A dedicated electrical panel supplying a 3-phase, 3-wire voltage of 380 V and a capacity of 50 KVA or more shall be installed in the radiography room or operating room. Provide a ground terminal of Class C or higher.
(7)	Air-conditioning facilities	Install a cooling unit equivalent to the heating value of the equipment to be installed (temperature conditions 15 - 35°C, humidity conditions 45 - 85% under equipment use)

Figure 3 X-ray room floor plan and required specifications (MCH)

➢ Steam sterilizer

The room where a steam sterilizer is expected to be installed is in B1F of BLOCK 3, in the Central Materials Department. The existing layout of the access route from outside to the entrance, and width of doors and corridors, means there is no difficulty carrying equipment inside. The rooms allocated for equipment have enough space. In addition, the layout of the central materials division has an ideal flow plan, with proper routes for cleaning, assembly, sterilization, and secured storage, as well as surgical equipment carried in and out using the special elevators provided for clean and unclean baggage, respectively.

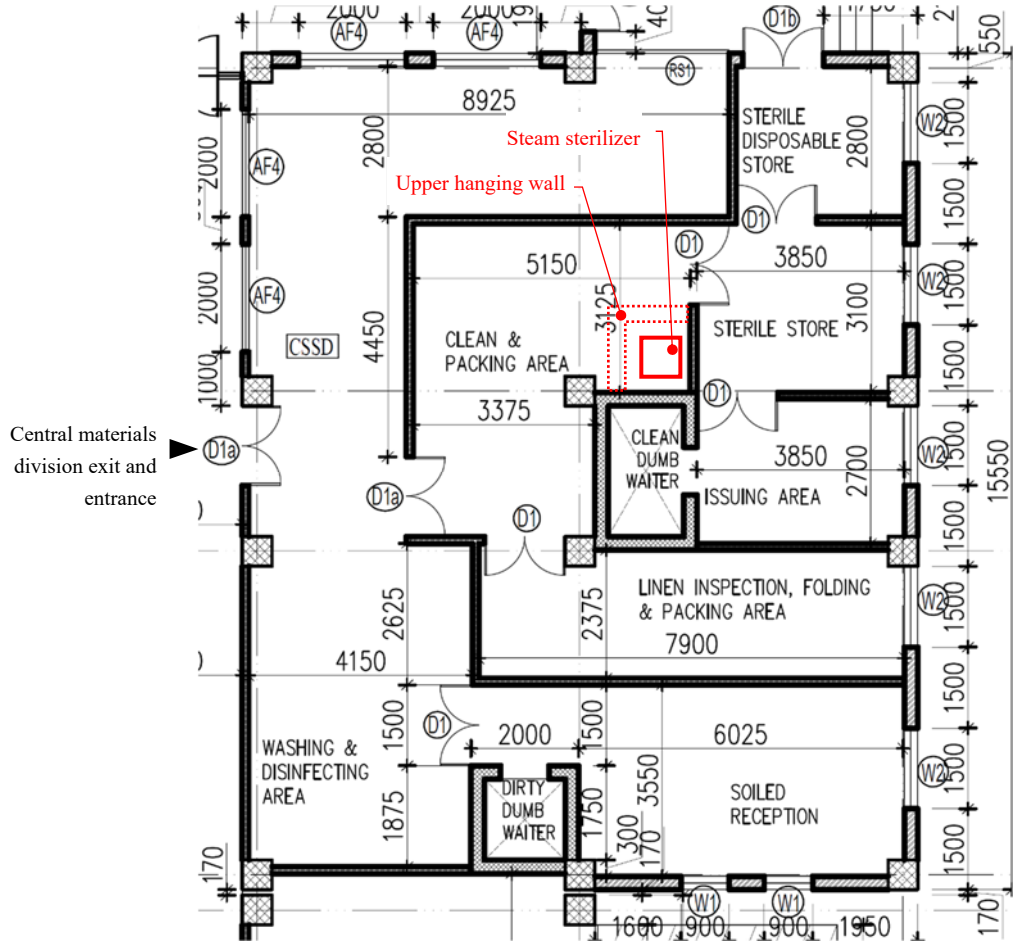
Figure 4 Basement B1 floor plan, BLOCK 3 (MCH)

However, the following items have not been confirmed in the design documents as of November 2022 which are prerequisites for the installation of the requested equipment.

- Specifications of power supply and grounding terminals
- Specifications of water supply, drainage, and exhaust systems
- Temperature and humidity environment with a cooling system

Installation of the requested equipment shall be performed after confirming that the construction

status meets these conditions. The following are the required specifications and plans of the facilities necessary for equipment installation.



※Red letters and red lines added on design drawing indicate the equipment and its locations assumed for installation.

Facility Requirements

No.	Item	Technical Specification
(1)	Power supply	AC100V - 15A, AC200V 3 ϕ - 98A or more Terminal installation shall be provided with D type or higher.
(2)	Water supply equipment	Pressure 0.1 - 0.2 MPa, capacity: 12 L/min or more, temperature: 25° C or less
(3)	Treated water facilities	Purity, electrical conductivity 5 - 10 μS/cm, pressure 0 - 0.2 MPa, capacity 5 L/min or more, temperature 15° C or less
(4)	Exhaust and drainage facilities	The system shall be capable of independent outdoor exhaust and drainage, and the piping shall be SGP50A or higher. Provide a hanging wall around the equipment due to the generation of hot steam to the top of the equipment.
(5)	Air-conditioning facilities	Install a cooling unit equivalent to the heating value of the equipment to be installed (temperature conditions 10 - 40° C, humidity conditions 30 - 85% under equipment use).

Figure 5 Central material department plan and requirements (MCH)

(1) ERRH (Eastern Regional Referral Hospital)

➢ General digital X-ray machine

The request from this facility is the renewal of the radiography equipment installed in the existing radiography room, and we confirmed with the staff in charge at the site that basic installation conditions for new equipment, including power supply, air conditioning, and equipment delivery route, meet the prerequisites.

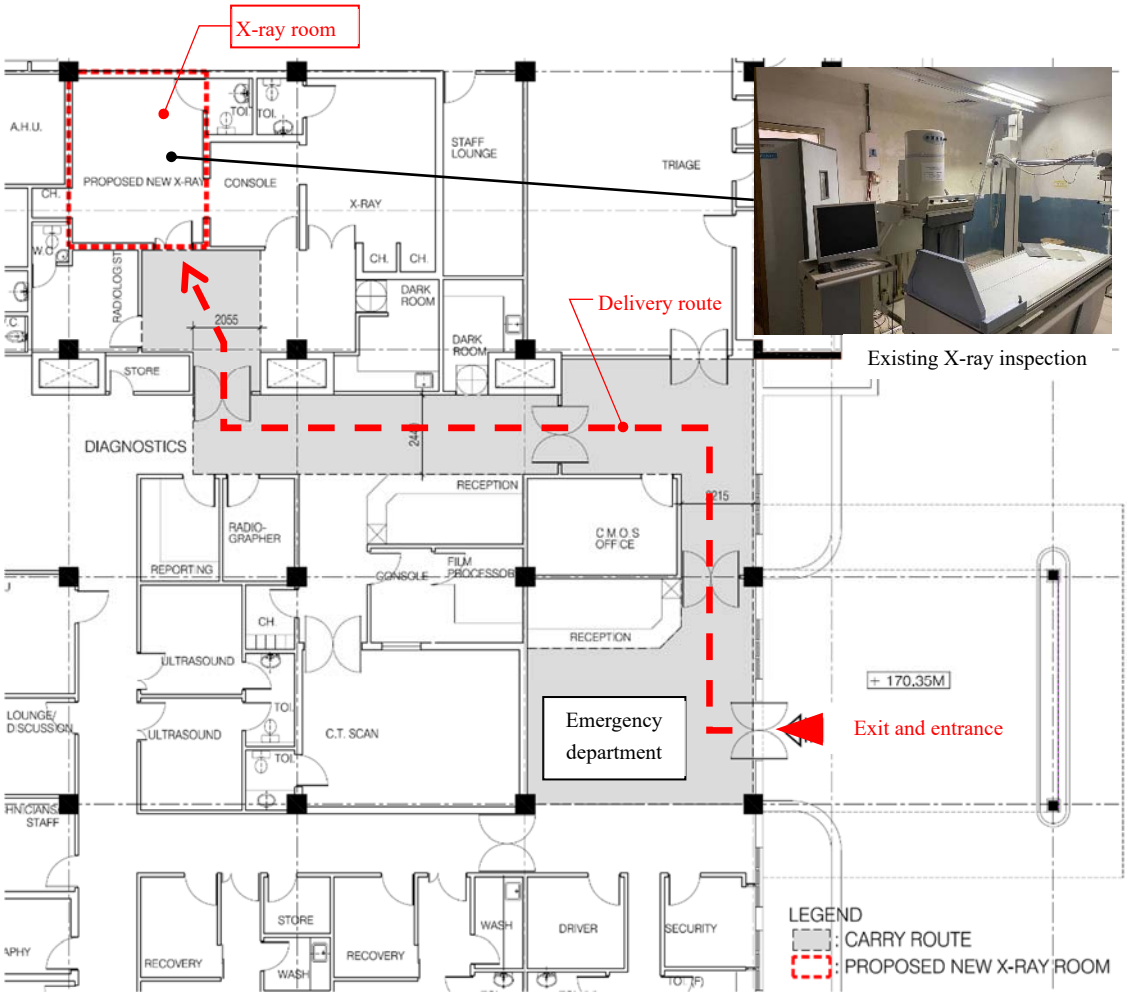


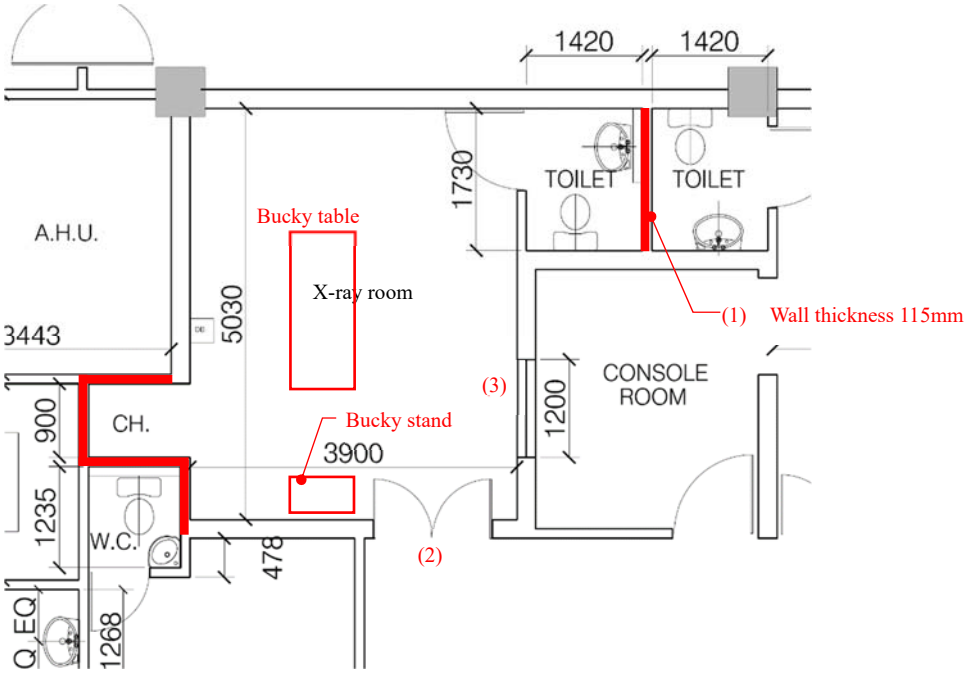
Figure 6 Equipment delivery route (Ground floor plan of ERRH)

However, the following items not meeting the conditions required for the installation of the requested equipment were confirmed by the field survey as of November 2022.

- The thickness of radiation shielding walls (changing rooms and toilet wall thickness of 115 mm)
- Radiation shielding performance of doors, windows, and other openings (including frames) (wooden doors and frames are used)

Installation of the requested equipment shall be performed after confirming that the construction

status meets these conditions. The following are the required specifications and plans of the facilities necessary for equipment installation.



※Red letters and red lines indicate the assumed equipment installation locations added to the design drawings.

Facility Requirements

No.	Item	Technical Specifications
(1)	Chamber structure	The walls shall be coated with brick or mortar at least 25 cm thick or thicker in accordance with local regulations, or equivalent radiation shielding measures shall be taken.
(2)	Radiation shield door	Doors for entrances and exits shall be lead-lined with a minimum of 2.0 mm for both frames and doors, with an effective width of 1.4 m and an effective height of 2.1 m or more.
(3)	Control window	Radiation shielding glass with a lead equivalent of 2.0 mm or more shall be inserted, and window frames shall be protected with lead plates of 2.0 mm or more.
(4)	Power supply	A dedicated electrical panel supplying a 3-phase, 3-wire voltage of 380 V and a capacity of 50 KVA or more shall be installed in the radiography room or operating room. Provide a ground terminal of Class C or higher.

Figure 7 General digital X-ray room floor plan and required specifications (ERRH)

(3) Trashigang District Hospital

➢ Steam sterilizer

The rooms where this equipment is expected to be installed are in the surgery department on the first floor of the hospital building. We have confirmed that the existing layout of the access route from outside of the site to the entrance, width of doors and corridors, movement between upper and lower floors, and rooms where the equipment will be installed are sufficiently spacious. Therefore, the equipment can be carried in without any problems in the existing layout.

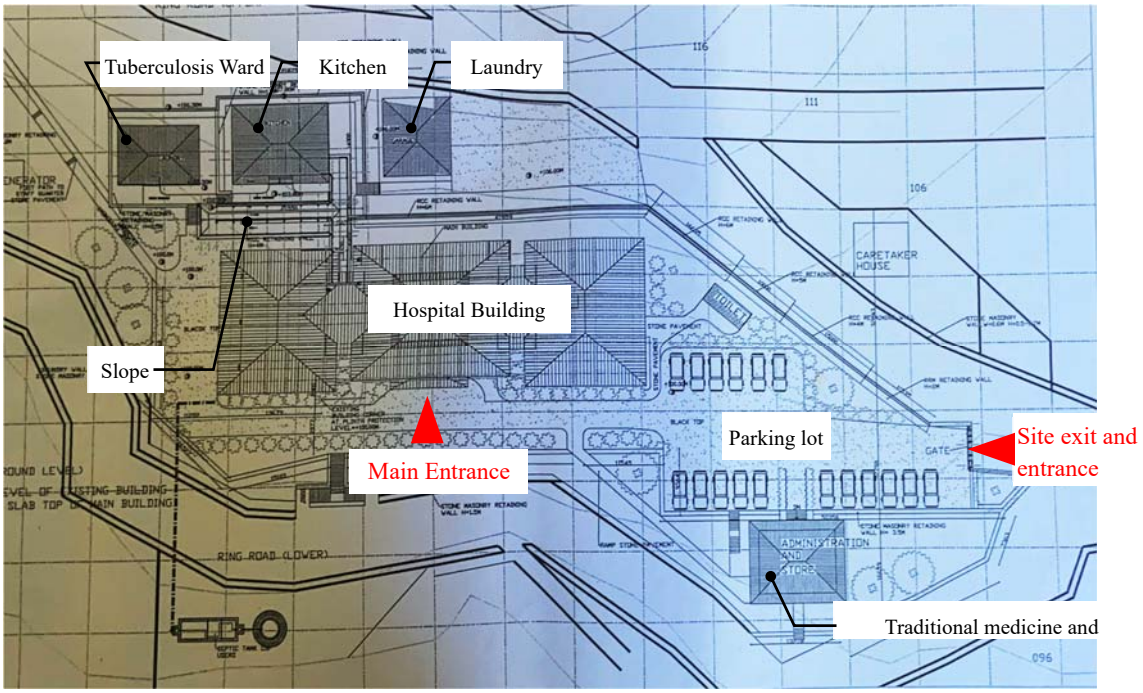
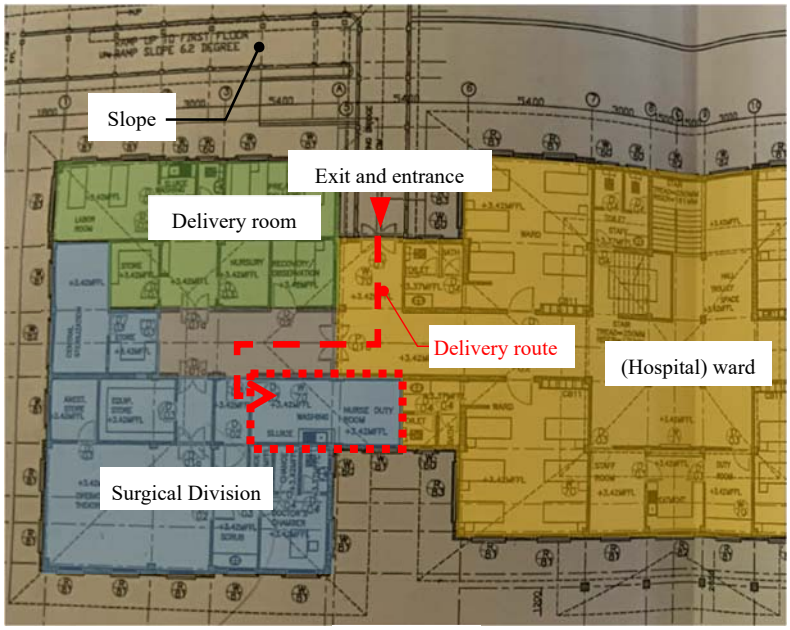


Figure 8 Facility layout (Trashigang District Hospital)

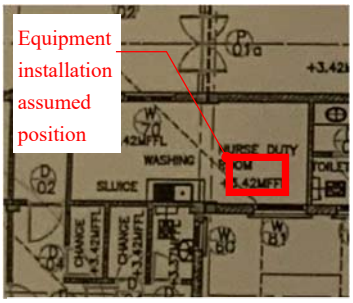
The installation of equipment in this facility is the renewal of the existing steam sterilizer, and the staff in charge at the site have confirmed that the existing equipment is operating without any problem. The power and water supply as well as drainage facilities for the new equipment meet the basic installation conditions.

However, renovation work is necessary to meet the required specifications for the installation of the equipment listed below. Installation of the requested equipment shall be performed after confirming that the construction status meets these conditions. The following are the required specifications and plans of the facilities necessary for equipment installation.



First floor plan

Existing steam sterilizer



Equipment installation room

Facility Requirements

No.	Item	Technical Specifications
(1)	Power supply	AC100V - 15A, AC 200V 3 ϕ - 98A or more Terminal installation shall be provided with D type or higher.
(2)	Water supply equipment	Pressure 0.1 - 0.2 MPa, capacity: 12 L/min or more, temperature: 25° C or less
(3)	Treated water facilities	Purity, electrical conductivity 5 - 10 µS/cm, pressure 0 - 0.2 MPa, capacity 5 L/min or more, temperature 15° C or less
(4)	Exhaust and drainage facilities	The system shall be capable of independent outdoor exhaust and drainage, and the piping shall be SGP50A or higher. Provide a hanging wall around the equipment due to the generation of hot steam to the top of the equipment.
(5)	Installation environment	Provide adequate ventilation and cooling units to achieve temperature conditions of 10 - 40° C and humidity conditions of 30 - 85% under equipment use.

Figure 9 Steam sterilizer installation room floor plan and required specifications (Trashigang District Hospital)

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The project will be implemented in accordance with Japan's Grant Aid Scheme. After the approval of the cabinet of the government of Japan, an Exchange of Notes (E/N) on the project will be concluded between RGOB and the government of Japan, and a Grant Agreement (G/A) will be concluded between RGOB and Japan International Cooperation Agency (JICA).

Then, a Japanese consultant firm recommended by JICA will conclude a Consulting Service Agreement with the Ministry of Health (MOH). The consultant will implement the bidding-related work and the supervision work of the project in accordance with the Consulting Service Agreement. The Japanese supplier selected in the bidding will procure the equipment under the Contract Agreement concluded with MOH. The supplier will procure, transport and install the equipment, provide technical guidance on the operation and maintenance of all the equipment and prepare technical documents such as manuals and the agent list for the equipment.

2-2-4-2 Implementation Conditions

Development cooperation division, and debt management division, Department of macro-fiscal and development finance, Ministry of Finance (MOF) takes charge of assistance from abroad in Bhutan. The E/N is signed between two Ambassadors in New Delhi. G/A is signed between JICA and Director of Department of Macro-fiscal and Development Finance. Banking Arrangement (B/A) for Japan's Grant Aid and issue an Authorization to Pay (A/P) is the Chief of Division, Development Coordination and Debt Management Division. All tax for equipment and materials in the bilateral assistance project shall be exempt in accordance with the G/A.

2-2-4-3 Scope of Work

(1) Scope of Work on Procurement Process

- Government of Japan
  1) Procurement of the equipment
  2) Marine and land transportation of the equipment to the target facilities
  3) Installation of the equipment
  4) Test operation of the equipment, technical training on preventive maintenance and daily inspection
  5) Implementation of soft component
  6) Maintenance service of the radiological equipment
- RGOB
  1) Providing required information and documents for transportation, installation of the equipment
  2) Acquisition of required permits for import of the equipment
  3) Preparation of the room for the equipment

4) Securing the locations for unloading the equipment
5) Providing the space for the storage of the equipment
6) Securing the route to carry in the equipment
7) Removal of existing equipment and repair of the room

(2) Classification of Responsibility for Facility Development

Bhutan will be responsible for the maintenance of facilities at each target facility for the installation of radiation equipment and steam sterilizers, but Japan will be responsible for the supply of some materials. The details of the maintenance and the responsibilities to be borne by each country are as follows:

1) 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar

The new hospital is currently under construction, and Bhutan will be responsible for the preparation of all necessary rooms, equipment, and transport routes for the general digital radiography equipment and steam sterilizer listed below. However, lead glass and UPS will be supplied by the Japan side.

- Digital general X-ray machine

Facility Maintenance Items	Bhutan's Responsibility	Japan's Responsibility
Chamber Structure The walls shall be coated with brick/mortar at least 25 cm thick or of a thickness in accordance with local regulations, and the upper floor slab shall have a concrete thickness of 15 cm or equivalent radiation shielding measures. The ceiling height shall be 2,350 - 2,900 mm.	✓	-
Radiation shield door Doors for entrances and exits shall be lead-lined with a minimum of 2.0 mm for both frames and doors, with an effective width of at least 1.4 m and an effective height of at least 2.1 m.	✓	-
Control window Radiation shielding glass with a lead equivalent of 2.0 mm or more must be inserted, and window frames must be protected with lead plates of 2.0 mm or more.	✓	✓ (Lead glass supply)
Cable opening An opening W200 x H150 for cable penetration shall be provided in the partition wall between the radiography room and the operating room, and both sides of the opening shall be protected with lead plates 2.0 mm or more. If the cables to the X-ray system intersect with the user's line of flow, a wiring pit should be provided between the X-ray system and the radiography room.	✓	-
Carry-in door Doors and corridors from the ground level entrance of the building to the room shall have an effective width of 1.4 m and an effective height of 2.1 m or more.	✓	-
Power supply A dedicated electrical panel supplying a 3-phase, 3-wire voltage of 380 V and a capacity of 50 KVA or more shall be installed in the radiography room or operating room. Provide a ground terminal of Class C or higher.	✓	✓ (UPS supply)
Air-conditioning facilities Install a cooling unit equivalent to the heating value of the equipment to be installed (temperature conditions 15 - 35° C, humidity conditions 45 - 85% under equipment use)	✓	-

- Steam sterilizer

Facility Maintenance Items	Bhutan's Responsibility	Japan's Responsibility
Power supply AC100V - 15A, AC200V 3 ϕ - 98A or more Terminal installation shall be provided with D type or higher.	✓	-
Water supply equipment Pressure 0.1 - 0.2 MPa, capacity: 12 L/min or more, temperature: 25° C or less	✓	-
Water treatment facilities Purity, electrical conductivity 5 - 10 μ S/cm, pressure 0 - 0.2 MPa, capacity 5 L/min or more, temperature 15° C or less	✓	-
Exhaust and drainage facilities The system shall be capable of independent outdoor exhaust and drainage, and the piping shall be SGP50A or higher. Provide a hanging wall around the equipment due to the generation of hot steam to the top of the equipment.	✓	-
Air-conditioning facilities Install a cooling unit equivalent to the heating value of the equipment to be installed (temperature conditions 10 - 40° C, humidity conditions 30 - 85% under equipment use).	✓	-

2) ERRH (Eastern Regional Referral Hospital)

- Digital general X-ray machine

Facility Maintenance Items	Bhutan's Responsibility	Japan's Responsibility
Removal of existing X-ray equipment	✓	-
Chamber structure The walls shall be coated with brick or mortar at least 25 cm thick or thicker in accordance with local regulations, or equivalent radiation shielding measures shall be taken.	✓	-
Radiation shield door Doors for entrances and exits shall be lead-lined with a minimum of 2.0 mm for both frames and doors, with an effective width of 1.4 m and an effective height of 2.1 m or more.	✓	-
Control window Radiation shielding glass with a lead equivalent of 2.0 mm or more must be inserted, and window frames must be protected with lead plates of 2.0 mm or more.	✓	✓ (Lead glass supply)
Power (button on TV, etc.) A dedicated electrical panel supplying a 3-phase, 3-wire voltage of 380 V and a capacity of 50 KVA or more shall be installed in the radiography room or operating room. Provide a ground terminal of Class C or higher.	✓	✓ (UPS supply)
Other incidental work required for equipment installation	✓	-

3) Trashigang District Hospital

- Steam sterilizer

Facility Maintenance Items	Bhutan's Responsibility	Japan's Responsibility
Power supply AC100V - 15A, AC200V 3φ - 98A or more Terminal installation shall be provided with D type or higher.	✓	-
Water supply equipment Pressure 0.1 - 0.2 Mpa, capacity: 12 L/min or more, temperature: 25°C or less	✓	-
Water treatment facilities Purity, electrical conductivity 5 - 10 μS/cm, pressure 0 - 0.2 Mpa, capacity 5 L/min or more, temperature 15°C or less	✓	-
Exhaust and drainage facilities The system shall be capable of independent outdoor exhaust and drainage, and the piping shall be SGP50A or higher. Provide a hanging wall around the equipment due to the generation of hot steam to the top of the equipment.	✓	-
Installation environment Provide adequate ventilation and cooling units to achieve temperature conditions of 10 - 40°C and humidity conditions of 30 - 85% under equipment use.	✓	-

2-2-4-4 Consultant Supervision

The consultant will supervise the equipment procurement by the supplier after the bidding. In particular, verification of conformity of the contract documents, pre-shipment inspection, confirmation of the progress of transportation and custom clearance, final inspection and supervision of maintenance services will be conducted by the consultant. Moreover, the consultant shall make every effort to monitor the progress of each process of the project and report to the relevant organizations and provide appropriate advice and instructions to both the implementing agency in Bhutan and the supplier. The consultant will conduct spot field supervision until the end of the project.

2-2-4-5 Procurement Plan

(1) Procurement Sources

In accordance with Japan's grant aid scheme, Japanese products shall be procured in principle since there are no products manufactured in Bhutan. However, products from a third country will 2-be considered for procurement of competitive bidding.

The local agents of medical equipment are limited in Bhutan and most of the consumables and spare parts are purchased from agencies in India, and engineers are dispatched from India when the equipment needs to be repaired. In consideration of this, maintenance service for radiology equipment shall be included in the project. The equipment with maintenance service shall be procured from a manufacturer whose agent is located in Bhutan or India.

(2) Transportation route

The equipment to be procured from Japan shall be shipped from the port of Yokohama to the

port of Kolkata in India. Then the equipment is carried overland through India to Phuentsholing, which has a border with India, and clears customs there.

There are three border areas with India: Phuentsholing, Gelephu and Sumdrup Jongkhar. Customs clearance is available only in Phuentsholing. After customs clearance, it is possible to return to Indian territory and transport the equipment to Bhutan from the other border crossings. However, since the northern part of India is unstable, the border may be closed in the event of strikes, etc. Thus, the route shall be considered depending on the security situation at the time of procurement.

2-2-4-6 Operational Guidance Plan

Initial setting adjustment, test operation and functional inspection and operation training shall be done by the engineers of the manufacturers or local agents after installation of the equipment. The engineers will give instructions on basic operation, consumable replacement and daily maintenance as part of operation training. Since maintenance services are to be included with the radiological equipment, the consultant shall explain the contents of the services and contact structure in case of malfunctions to the user in the target facilities and MoH.

2-2-4-7 Soft Component Plan

The medical equipment to be procured under this project is commonly used in Bhutan, but due to recent technological innovations, the structure and control method of medical equipment has changed from mechanical to electrical and electronic. As a result, the amount of medical equipment that is difficult or impossible for users to repair themselves when it breaks down is increasing. The people available to maintain the medical equipment are few in number and there are a limited number of medical equipment distributors. In Bhutan, the viewpoint of using medical equipment without breaking it is very important. Medical equipment that is expensive and difficult to operate, such as radiation equipment and endoscope equipment, is handled by doctors and specialized medical personnel, but equipment that is frequently used in daily care, such as suction machines, infusion pumps, and patient monitoring equipment is often handled by nurses. It goes without saying that proper operation of medical equipment leads to medical safety. However, during a field survey, it was found that the incubator was covered with a sheet, causing the main unit to become hot, which caused it to malfunction. In addition, there were some cases where medical equipment malfunctioned and the risk of accidents increased due to inappropriate use, such as the use of inspection equipment without removing the protective film during transportation, which became a factor in the propagation of various bacteria. In Bhutan, although medical equipment is being used while maintaining relatively good conditions, awareness of the safety of medical equipment is still low. It lacks the concept of "properly maintaining, long-lasting,

and using without breaking down" medical equipment with correct knowledge.

Therefore, in order to permeate and establish this way of thinking, it is effective to provide medical professionals, especially nurses, with "user training" that teaches them how to use general medical equipment correctly and how to check at the beginning and end of work. Since the majority of manpower in the medical field is nurses, it is thought that improving the awareness and skills of nurses will lead to a positive effect for the hospital as a whole.

Therefore, this project will include technical guidance as a soft component for the purpose of strengthening the capacity for routine maintenance and preventive maintenance of medical equipment.

2-2-4-8 Implementation Schedule

The implementation schedule is shown in the table below. It is expected to take 11 months for bidding-related work and 11 months for procurement and installation of the equipment after conclusion of G/A (excluding the soft component). Since there is a four-year maintenance service period for radiology equipment after a one-year warranty period, the entire implementation schedule shall be completed in five years after the handing over of the equipment.

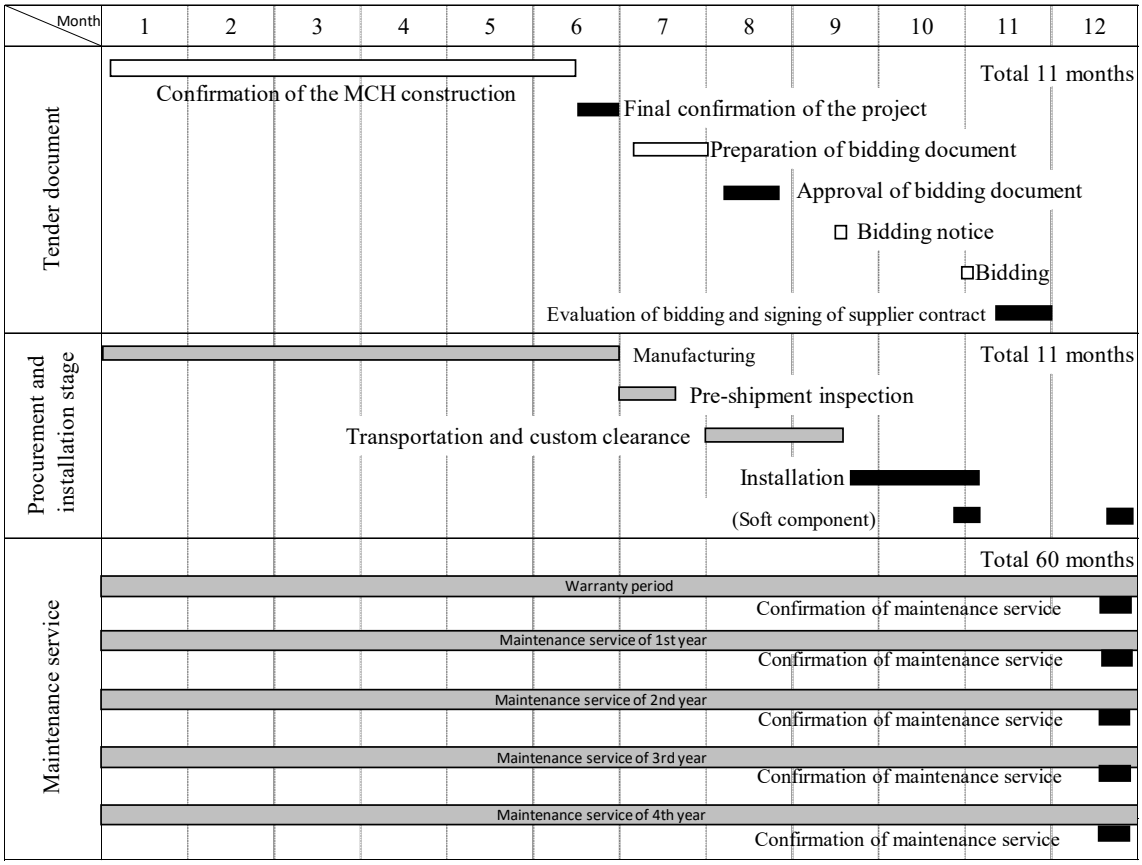


Figure 10 Implementation schedule of the project

2-3 Obligations of Recipient Country

The responsibilities of the Bhutan side in the implementation of the project are described in "2-2-4-3 Scope of Work". The following work shall be undertaken by MOH in association with relevant organizations and target facilities.

- Facilitation of signing B/A and issuing A/P
- Facilitation of issuing any other official documents indispensable for the implementation
- Facilitation of procedures for custom clearance and tax exemption for the equipment and maintenance services
- Completion of the construction of MCH before the installation of the equipment
- Implementation of other physical work necessary for before and after installation of the equipment
- Allocation of personnel to correctly use the equipment
- Allocation of budget for operation and maintenance of the equipment
- Assurance of convenience and safety for consultants and suppliers
- Waiver of customs and other various taxes for the supplier and its employees

The cost of the physical work to be borne by Bhutan is estimated at about 1,200,000 BTN. The cost includes that for removal and/or relocating of existing equipment and material for work such as concrete-related work.

2-4 Project Operation Plan

2-4-1 Human Resources Allocation

The WHO recommended doctor to population ratio is 1:1,000 and the nurse to population ratio is 4:1,000; these figures are 0.46 and 1.8, respectively, in Bhutan. Thus, the shortage of human resources is a major challenge for providing quality health care. The table below indicates the number of health workers in Bhutan.

Currently, it is necessary to study abroad to be a doctor due to no training institutions for medical doctors. A certain number of slots are set aside each year for medical students, and RGOB pays all study abroad expenses.

From 2018 to 2020, a total of 75 medical doctors have been trained. However, the long-term trainees were forced to return Bhutan as well as the new candidates were not selected during the pandemic. This situation affected the future human resource development plan. Note that study abroad programs are gradually being resumed in 2022.

The personnel for MCH, which will be completed in 2024, will be transferred from the maternal- and child health-related departments of ERRH. Although additional staff will be

required to operate the hospital because of the function expansion, the required staff will be recruited under the supervision of the MOH. Aside from MCH, the necessary staff for utilizing the equipment to be procured are already in place.

Table 8 Number of health workers in Bhutan

	2016	2017	2018	2019	2020
Doctor	299	345	337	318	336
Of which are specialists			92	114	122
Nurse	1,185	1,264	1,202	1,364	1,517
Health Assistant	658	636	604	620	650

Source: Annual Health Bulletin 2017-2021

2-4-2 Maintenance of Equipment

The maintenance and management of medical equipment in Bhutan is carried out by the Bio Medical Engineering Division (BMED) of the Department of Medical Equipment Procurement and Health Infrastructure, Ministry of Health (MOH). BMED consists of the headquarters in Thimphu, a branch office in the Eastern Regional Referral Hospital (ERRH), and a branch office in the Central Regional Referral Hospital (CRRH), and manages medical equipment at 48 medical facilities nationwide under the jurisdiction of the MOH. BMED of the MOH inspects and maintains medical equipment at all medical facilities in all regions of Bhutan, responds to malfunctions, inspects newly procured equipment and acceptance, attends installation work, and provides guidance on the operation of new equipment. In addition, we also deal with problems that are difficult to deal with at the branch office and create specifications for standard medical equipment.

The two branch offices inspect and maintain medical equipment at the Regional Referral Hospital, their affiliated prefectural hospitals, and 10-bed hospitals.

Personnel who maintain medical equipment are Bio Medical Engineers who have acquired a bachelor's degree and Bio Medical Technicians who have completed a two-year course at a vocational school. Bio-medical engineers and technicians assigned to BMED, CRRH, and ERRH perform maintenance of medical equipment at the hospitals to which they are assigned and at subordinate facilities in each region (western, central, and eastern regions).

In addition, domestic medical engineers can handle failures of small medical equipment, but if a problem occurs with large equipment such as radiological equipment, there are only a limited number of medical equipment agents in Bhutan, so an Indian agent is often asked to dispatch technicians.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

Expenses borne by Bhutan are estimated as shown below.

(1) Expenses borne by Bhutan

Items	Expense（BTN）
Renovation/Extension work	1,200,000 (1.80 million yen)
Others (i.e., commission)	700,000 (1.10 million yen)
Total	1,900,000 (2.90 million yen)

2-5-2 Operation and Maintenance Cost

As shown in the table below, the health budget has been increasing every year. Furthermore, the budget for 2021-2022 increased by 43% over the previous year because the COVID-19 activities-related budget was allocated. As a result of this, approximately 11% of the RGOB budget is allocated to the health sector. In the health budget, 1.4 billion yen is allocated for the procurement of essential medicine and medical equipment. Bhutan's fiscal year runs from July to June, and the budget for the following fiscal year is prepared from January to February each year.

Table 9 Budget for health sector

	2019-20	2020-21	2021-22
Total health budget	5,730	6,437	9,236
Health sector allocation of total allocation	9%	9%	11%
Of which budget for MOH+	2,304	3,549	3,330
Of which budget for procurement of drugs and nondrugs and medical equipment	-	1,376	1,412

（Unit: Million BTN）

Source: Budget Report 2019-20, 2020-21, 2021-22. Ministry of Finance

The consumables for a few months will be included in the project in order to smooth initial operation but after that, RGOB will need to procure the consumables continuously. The annual cost of consumables is estimated to be approximately 7.51 million BTN (1,150 million yen). In addition, the maintenance service cost (approximately 3 million BTN per year) will be secured by RGOB if RGOB is willing to continue maintenance. Securing the necessary budget for the operation and maintenance has been agreed with RGOB.

Chapter 3 Project Evaluation

Chapter 3 Project Evaluation

3-1 Preconditions

The responsivities of the Bhutan side described in “Obligation of Recipient Country” shall be fulfilled for the implementation of the project. Especially, the construction of the MCH, which has been conducted under the responsibility of the Bhutan side, shall be completed in advance of the installation of the equipment in the project. It is a precondition for the smooth implementation of the entire project. Accordingly, MOH is requested to report to the JICA Bhutan office on the monthly progress report of construction work of the MCH. It also important that the necessary measures shall be taken by RGOB for customs clearance and tax-exemption for the equipment and maintenance service during the project.

3-2 Necessary Inputs by Recipient Country

The following inputs should be made by the Bhutan side.

- Allocation of personnel to adequately use and maintain the equipment
- Implementation of physical preparation work before and/or necessary renovation after installation of the equipment
- Continuous supply of consumables for the equipment
- Allocation of the budget for maintenance service of the radiological equipment after expiration of the maintenance service covered by the project
- Continuous education for health staff to effectively use and maintain the equipment

3-3 Important Assumptions

The following assumptions are important for the smooth implementation and sustainable effect of the project.

- The transportation and installation of the equipment will be implemented without any obstructions such as landslides and road collapses especially in the rainy season, frozen roads in winter, security problems in the area on the Indian border.
- Infrastructure of the target facilities such as electricity, water, roads and the surrounding environment will be maintained without any serious problems.
- The maintenance service will be continued by a local agent or manufacturer without suspension of business

3-4 Project Evaluation

3-4-1 Relevance

Improving access to health services is a top priority for Bhutan, which has a rugged terrain, variable weather conditions, and a widely dispersed population. While many efforts have been made so far, the 2011 Health Help Center project was a milestone. The project demonstrated that the use of ICT could overcome geographic and human limitations and expand health service coverage at a lower cost. Japan aided the mobility of the health help centers by furnishing ambulances and later helped strengthen the services provided at local hospitals by providing equipment to major hospitals. Currently, grant aid for strengthening specialized services for infectious diseases is underway. Although these programs may appear to be independent and distinct, there is a definite continuity in that each has made maximum use of the results of previous programs and has provided support that accurately addresses the needs of the Bhutanese government at that time. The current five-year plan aims to strengthen medical services in eastern Bhutan, which is the furthest from the capital and lags behind other regions in terms of health indicators, by providing the medical equipment needed to rectify the disparities in medical care among the regions of Bhutan.

Based on the above, implementation of this plan is deemed to be highly appropriate.

3-4-2 Effectiveness

Implementation of the project is expected to enhance maternal and child health care services in the eastern region of Bhutan by providing medical equipment, mainly for maternal and child health care, which will have the following effects.

(1) Quantitative effects

Indicator	Baseline number (2020)	Target number (2027) [Three years after the Project's completion]
1) Number of deliveries at cooperating facilities/year	1,923	2,250
2) Number of ultrasound examinations/year at maternal and child health care hospitals and district hospitals in eastern Bhutan	7,996	9,500

The rationale for the baseline and target numbers for each of the quantitative effectiveness indicators is as follows:

1) Number of deliveries at cooperating facilities/year

The population of Bhutan in 2027 is estimated to be approximately 797,000, and assuming that the eastern region has a 24% share of the population, eastern Bhutan will have a population of about 190,000. Currently, the crude birthrate in the Bhutan is 17 (per 1,000 population), and it's decreasing gradually. Assuming that this continues, the number of births in the eastern region in 2027 is estimated to be 2,470. The target value is set based on the fact that about 70 to 80% of these deliveries are expected to take place at cooperating facilities and that changes in medical treatment due to equipment upgrades will also be taken into account.

2) Number of ultrasound examinations/year at maternal and child health care hospitals and district hospitals in eastern Bhutan

Since ultrasounds are expected to be widely used not only for prenatal checkups but also for diagnosing gynecological diseases, etc., the target number should take into account the higher number of births as well as other examinations.

(2) Qualitative effects

1) Improvement of comprehensive emergency obstetrics care and neonatal intensive care services

The procurement of medical equipment for maternal and child health care hospitals is expected to improve the comprehensive emergency obstetrics care and neonatal intensive care services provided at hospitals and enhance the level of maternal and child health care throughout the eastern region.

2) Provision of quality medical care in the community and reduction of patient burden

In each of the eastern region's districts, equipment will be made available to those medical facilities under the district hospitals, so that residents can receive high-quality examinations and maternity care at nearby locations.

Appendices

Appendix 1. Member List of the Survey

(1) Preparatory Survey (July 2021- August 2022)

1	**Mr. Tatsuya Ashida** Team Leader	Health Team 4, Human Development Dept., JICA
2	**Ms. Rie Sato** Cooperation Planning	Health Team 4, Human Development Dept., JICA
3	**Kazuhiro ABE** Project Manager/ Medical Equipment Planning 1	International Techno Center Co., Ltd.
4	**Kota YOSHIFUJI** Deputy Project Manager/ Medical Equipment Planning 2	International Techno Center Co., Ltd.
5	**Yasuhiro HIRUMA** Maintenance Planning/ Procurement Planning /Cost Estimation	
6	**Kosei YANAGI** Facility Planning 1/ Facility renovation	K.ITO Architects & Engineers Inc.
7	**Yosuke IKEDA** Facility Planning 2/ ICT environment & Infrastructure	Yachiyo Engineering Co., Ltd.
8	**Yu HASEGAWA** Digital Health / Telemedicine	Mitsubishi UFJ Research and Consulting Co., Ltd.
9	**Ryota SAKAMOTO** Health Planning	Center for Southeast Asian Studies, Kyoto University

(2) Explanation of Draft Final Report(September 2022)

1	**Ms. Rie Sato** Team Leader	Health Team 4, Human Development Dept., JICA
2	**Maki Nagai** Cooperation Planning	Health Team 4, Human Development Dept., JICA
3	**Kazuhiro ABE** Project Manager/ Medical Equipment Planning 1	International Techno Center Co., Ltd.
4	**Kota YOSHIFUJI** Deputy Project Manager/ Medical Equipment Planning 2	International Techno Center Co., Ltd.
5	**Yasuhiro HIRUMA** Maintenance Planning/ Procurement Planning /Cost Estimation	

Appendix 2. Survey Schedule

2021 July-September	Remote survey
2021 October-December	Field survey1
2022 January-August	Remote survey
2022 August 5th	Minutes of Discussion for OD
2022 September 21st	Minutes of Discussion for DOD
2022 November	Field survey2

(1) Field survey 1 (October 24 – December 8, 2021)

No.	DATE		Deputy Project Manager/ Medical Equipment Planning 2	Maintenance Planning/ Procurement Planning /Cost Estimation	Facility Planning 1/ Facility renovation
			Kota YOSHIFUJI	Yasuhiro HIRUMA	Kosei YANAGI
0	10/23	SAT	PCR test in Japan		
1	10/24	SUN	Tokyo-Delhi (JL039 10:50-17:00)		
2	10/25	MON	Delhi –Paro(KB201 10:50-13:20) *Mandatory 14-days Quarantine DAY0*		
3	10/26	TUE	*Mandatory 14-days Quarantine*		
16	11/8	MON			
17	11/9	Tue	JICA Bhutan Office Ministry of Health		
18	11/10	Wed	Coutesy call with Minister KGUMSB HHC		AM: Same as left PM: Local consultant
19	11/11	Thu	Paro-Yonphula(KB080 08:00-0845)		
20	11/12	Fri	Facility Survey【Trashigang Hospital, Rangjung hospital】		
21	11/13	Sat	Facility Survey【Trashiyangtse Hospital, Khamdang Hospital】		
22	11/14	Sun	Team meeting		
23	11/15	Mon	Facility Survey【Riserboo hospital, Kanglung hospital,Khaling hospital】		
24	11/16	Tue	Facility Survey【Dremitse PHC,Yadi PHC】		
25	11/17	Wed	Facility Survey【ERRH, MCH, Gyelpozhing hospital】		
26	11/18	Thu	Facility Survey【ERRH, MCH, Gyelpozhing hospital】		
27	11/19	Fri	Facility Survey【Lhuentse hospital, Autsho hospital】		
28	11/20	Sat	Facility Survey【ERRH,】		Mongar-Trashigang
29	11/21	Sun	Team meeting		Yonphula - Paro（PCR test）
30	11/22	Mon	Facility Survey【ERRH,Trashiganga hospital】		Paro-Delhi
31	11/23	Tue	Additional survey in Trashigang		Delhi–Tokyo
32	11/24	Wed	Yonphula-Paro(KB031 9:25-10:10) JICA Bhutan Office		–Tokyo
33	11/25	Thu	GNHC MOH(Equipment plan)）		
34	11/26	Fri	Meeting with JICA HQ (WEB) WHO MOH	Local agnet for medical equipmet	
35	11/27	SAT	Documentation		
36	11/28	Sun	Team meeting		
37	11/29	Mon	Survey at Thimphu	Local agnet for medical equipmet	
38	11/30	Tue	Documentation MOH	Local agnet for medical equipmet	
39	12/1	Wed	Survey at Thimphu	BMED	
40	12/2	Thu	JDWNRH UNDP Preparation/ signing for technical note	Local agnet for medical equipmet BMED	
41	12/3	Fri	Preparation/ signing for technical note JICA Bhutan Office Signing for technical note	MOH	
42	12/4	Sat	Documentation		
43	12/5	Sun	Documentation/ PCR test		
44	12/6	Mon	Paro-Delhi(KB200 07:40-09:50)		
45	12/7	Tue	Delhi–Tokyo(JL030 19:55-06:55)		
46	12/8	Wed	–Tokyo		

(2) Field survey 2 **(November 7 – November 19, 2022)**

No.	DATE		Project Manager/ Medical Equipment Planning 1	Deputy Project Manager/ Medical Equipment Planning 2
			Kazuhiro ABE	Kota YOSHIFUJI
1	11/7	Mon	Tokyo-Bangkok（TG643 11:45-16:45）	
2	11/8	Tue	Bangkok-Paro(KB131 7:00-10:50) JICA,MOH	
3	11/9	Wed	MOH, JDWNRH	
4	11/10	Thu	Paro- Yonphula（KB030　07:15-8:00） Trashigang hospital, 10 beded hospital	
5	11/11	Fri	Trashigang―Mongar MCH／ERRH	
6	11/12	Sat	AM　MCH／ERRH Mongar―Trashigang	
7	11/13	Sun	Yonphula-Paro （KB031 9:25- 10:10）	
8	11/14	Mon	MOH	Thimphu-Gelephu CRRH
9	11/15	Tue	MOH	Gelephu-Thimphu
10	11/16	Wed	Paro-Bangkok(KB150 8:00-12:10) Bangkok―Tokyo（TG642 23:55-7:40:)	MoH
11	11/17	Thu	-Tokyo	MoH
12	11/18	Fri		Paro-Bangkok（KB130 8:30-14:15） Bangkok―Tokyo（TG682 23:15-6:55）
13	11/19	Sat		-Tokyo

Appendix 3. List of Parties Concerned in the Recipient Country

(1) Technical Working Group

1	Mr. Pemba Wangchuk	Acting Secretary(Chairperson)	Ministry of Health(MOH)
2	Mr. Kinga Jamphel	Director	Department of Medical Services
3	Mr. Tashi Penjor	Chief Planning Officer	Policy & Planning Division
4	Mr. Tashi Penjore	Chief Engineer	Bio-medical Engineering Division
5	Dr. Pelden Wangchuk	Medical Superintendent	Eastern Regional Referral Hospital
6	Ms. Pema Yangzom	Sr. Program Officer	Department of Medical Services
7	Ms. Choney Dema	Assistant Program Officer	Department of Medical Services
8	Ms. Kinley Zam	Sr. Planning Officer	Policy & Planning Division

(2) Meeting attendance list

Ministry of Health

1	Ms, Dechen Wangmo	Minister of Health
2	Dr. Pandup Tshering	Secretary
3	Mr. Pemba Wangchuk	Acting Secretary
4	Dr. Karma Lhazeen	Director, Department of Medical Services(DMS)
5	Mr. Kinga Jamphel	Director, DMS
6	Ms. Pema Yangzom	Sr. Program Officer, DMS
7	Ms.Choney Dema	Assistant Program Officer, DMS
8	Mr. Som Bdr	Program Analyst, DMS
9	Mr. Ugen Tashi	Chief Program Officer, DMS
10	Mr. Tandin Dorji	Chief Engineer, Health Infrastructure Development Division(HIDD)
11	Mr. Jampel Dorji	Executive Engineer, HIDD
12	Mr. Jigme Tenzin	Electrical Engineer, HIDD
13	Mr. Kinzang Galey	Civil Engineer, HIDD
14	Mr. Tashi Penjore	Chief Engineer, Biomedical Engineer Division (BMED)
15	Ms. Dechen Zangmo	Assistant Engineer, BMED
16	Ms. Tashi Pemo	Engineer , BMED
17	Mr. Tashi Penjor	Chief Planning Officer, Policy and Planning Division(PPD)
18	Ms. Kinley Zam	Sr. Planning Officer, PPD

Khesar Gyalpo University of Medical Sciences of Bhutan（KGUMSB）

19	Dr. Kinzang P. Tshering	President

20	Dr. Tashi Tenzhin	Dean of Faculty of Postgraduate Medicine
21	Dr. Sithar Dorjee	Director
22	Tashi Chogyel	Offtg, Planning Officer

Health Help Center

23	Mr. Ugen Tshering	Offtg, Chief Officer, Emergency Meical Service Department, MOH
24	Mr. Kuenzang Nima	Assistant program Office
25	Mr. Thering Dendup	Sr. Health Assistant
26	Mr. Leki Choden	Admin. Assistant
27	Mr. Birju Suwwar	Sr. ICT Assistant II

旧 Gross National Happiness Commission (GNHC)

28	Mr. Wangchuk Namgay	Chief Program Coordinator
29	Mr. Sonam Yarphel	Dy. Chief Planning Officer

Mongar Dzongkha Health Office

30	Deki Phuntsho	District Health Officer

Eastern Regional Referral Hospital

31	Dr. Pelden Wanchuk	Medical Superintendent
32	Mr. Karma Yeshi	Deputy Chief Administrative officer
33	Mr. Phuntsho Norbu	Nursing superintendent
34	Mr. Sonam Penjor	Civil Engineer

Gyelpoizhing 10 bedded hospital

35	Dr. Pasang Tobgeyel Thingh	General Duty Medical Officer
36	Ugyen Tshinley	Drungsho
37	Dr. Jamyang Chodup Gayley	General Duty Dental Surgeon
38	Samden Choden	Health Assistant
39	Sonam Dema	Staff Nurse
40	Karma Nidup	Staff Nurse/Ward in charge

Dremetse PHC

41	Tashi Dema	Health Assistant
42	Nechen Dorji	Health Assistant

Autsho PHC

43	Kezangla	Health Assistant
44	Pema Choden	Health Assistant
45	Tashi Penjor	Health Assistant
46	Dorji Tinzin	Mempa

Trashigang Dzongkhag Health Office

47	Mr. Gang Dorji	District Health Officer
48	Ms. Shacha Dema	Assistant District Health Officer
49	Mr. Kelzang Dorji	Assistant Administration Officer

Trashigang District Hospital

50	Tshewang Dorji	Ultrasound Technician
51	Kenzang Dorji	Assistant Administration Officer
52	Phub Thinley	Pharmacy Technician
53	Pema Norbu	Ward In charge
54	Tshering Deba	Pharmacist
55	Ngawanag Ynagden	Health Assistant
56	Leli Wangchuk	X-ray Technician

Rangjung 10 bedded Hospital

57	Dr. Chimi Wangmo	GDMO(General Duty Medical Officer)
58	Dr. Thewang Lhandup	General Duty Dental Surgeon
59	Pelden	Sr. Ophthalmic Assistant
60	Regang Tothsho	Pharmacy Technician
61	Kelzang Choden	Drungthso
62	Karma Gyelmo	Health Assistant
63	Suk Bdr Raj	Electrician
64	Kinley Wangda	Staff Nurse

Khamdang 10 bedded Hospital

65	Dr. Sheetal Bhujel	General Duty Dental Surgeon
66	Sonam Chophel	Sr, Health Assistant
67	Rinzan Gurung	Assistant Lab. Technician
68	Sonam Lhamo	Staff Nurse
69	Ugyen Tshering	Pharmacy Technician

70	Kinzang Tsheten	Ambulance Driver

Kanglung 10 bedded Hospital

71	Dr. Thinley Dorji	Medical Officer
72	Lodey Tshering	Health Assistant
73	Ran Bdr Gin	Laboratory technician
74	Jangchuk Dorji	General Duty Dental Surgeon
75	Indro Prasad Sharma	Pharmacy Technician
76	Tandin Wangmo	Staff Nurse
77	Pema Choki	X-ray Technician
78	Tshering Gyeltohen	Drungsho

Khaling 10 bedded Hospital

79	Tshejay Wangchuk	Health Assistant
80	Ngawang Gyeltshen	Staff Nurse
81	Dr. Lalyan Dahal	General Duty Dental Surgeon

Reserboo General Hospital

82	Kinley Dorji	Administrative officer
83	Jamyang Choden	Bio Medical Engineering Technician
84	Ram Rai	Sr. Nurse
85	Ngajoy Tshering	Pharmacist
86	Lelzang Choki	Physiotherapist
87	Tshewang Lhudup	Sr. Eye technician
88	Yangjay	Pharmacy Technician
89	Dr. Tashi Namgyel	Dental Surgeon
90	Sangay Phuntsho	Laboratory technician

Lhuentse District Hospital

91	Mr. Rinchen Dorji	Administrative officer
92	Ms. Phuntsho Wangmo	Clinical Nurse
93	Tshering Zempmo	Health Assistant
94	Ugyen Dorji	Pharmacy Technician

Trashiyangtse District Hospital

95	Dorji Wangmo	Administrative officer

96	Sangay Yonten	Assistant Administrative officer
97	Tshering Dorji	Bio Medical Engineer Technician
98	Dr. Namsa Dorji	Senior Medical Officer
99	Ugyen Phuntsho	Clinical Nurse Ⅲ
100	Sither Wangchuk	Dungtsho

WHO Bhutan

101	Ugyen Wangchuk	National Professional Officer
102	Thinley Zangmo	National Professional Officer
103	Dr. Lobzang Dorji	National Professional Officer

UNDP Bhutan

104	Ms. Azusa Kubota	Governance Portfolio Manager
105	Ms. Ngawang Dema	Project Formulation Adviser
106	Ms. Sangay Wangmo	Health Governance Specialist

T-Kunzom pvt. ltd

107	Mr. Bhawani Nirola	Project Manager
108	Mr. Jangchub Dorji	Engineer

4. Minutes of Discussions

4-1. **Minutes of Discussions for** OD

Minutes of Discussions
on the Preparatory Survey for the Project for
Strengthening Health Care Services in Eastern Area

In response to the request from the Royal Government of Bhutan (hereinafter referred to as "Bhutan"), Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") of the Project for Strengthening Health Care Services in Eastern Area (hereinafter referred to as "the Project") to Bhutan. The Team held a series of discussions with the officials of the Royal Government of Bhutan both in person and through online and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Thimphu, August 5, 2022

for 芦田 里哉

Mr. Tatsuya Ashida
Leader, Preparatory Survey Team
Japan International Cooperation Agency
Japan

Witnessed by

K. Watanabe

Mr. Kozo Watanabe
Chief Representative,
JICA Bhutan Office
Japan

Mr. Pemba Wangchuk
Offtg. Secretary
Ministry of Health
Bhutan

Witnessed by

Tashi Penjor

Mr. Tashi Penjor
Chief Planning Officer
Ministry of Health
Bhutan

1

(hereinafter referred to as "the Grant") as described in Annex 4 shall be applied to the Project.

As for the monitoring of the implementation of the Project, JICA requires Bhutan side to submit the Project Monitoring Report that the form is attached as Annex 5.

6-2. Bhutan side agreed to take the necessary measures, as described in Annex 6, for smooth implementation of the Project. The contents of the Annex 6 will be elaborated and refined during the Preparatory Survey and be agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report.

The contents of Annex 6 will be updated as the Preparatory Survey progresses, and eventually, will be used as an attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Bhutan or hold online meetings in order to explain its contents around August or Septermber 2022.

7-2. If the contents of the draft Preparatory Survey Report is accepted and the undertakings for the Project are fully agreed by the Bhutan side, JICA will finalize the Preparatory Survey Report and send it to Bhutan around November 2022.

7-3. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

8-1. The Bhutan side confirmed to give due environmental and social considerations during implementation, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).

8-2. The Project is categorized as "C" from the following considerations:

Not located in a sensitive area, nor has it sensitive characteristics, nor falls it into sensitive sectors under the Guidelines, and its potential adverse impacts on the environment are not likely to be significant.

9. Other Relevant Issues

9-1. Tax exemption

Bhutan side agreed to exempt customs duties, internal taxes and other fiscal levies such as Corporate Income Tax, Personal Income Tax, indirect tax (VAT and Commercial Tax), which may be imposed in Bhutan with respect to the supply of the products and services under the verified contract.

9-2. Project components

The items requested by Royal Government of Bhutan, which are described in Annex 3, subject to further discussion between the relevant authorities and the survey team. The final components of equipment for the Project will be defined through further analysis considering the budget and priorities.

9-3. Target facilities

Both sides agreed that the target facilities of the project are 1) 65 bedded Gyaltsuen Jetsun Pema Wangchuk Mother and Child Hospital, Mongar (hereinafter referred to as MCH), 2) Eastern Regional Referral Hospital (hereinafter referred to as ERRH), 3) six District/General hospitals and 4) eleven 10-bedded hospitals in the project sites. Among them, MCH is the hospital to be newly constructed/renovated, and the others are existing facilities.

The team explained that delay of the MCH construction work would affect the project implementation, and Bhutan side agreed that MCH will be completed 75% by the date of tender notice and that Bhutan side will bear any additional cost which may be caused by delay of the work. Bhutan side also agreed to submit the montly progress report with pictures of MCH construction to JICA.

In addition, Bhutan side agreed that the medical equipment provided at MCH will be utilized as soon as possible after installation with proper preparation and training of the users.

9-4. Repair/Expansion/Renovation work for facilities

Bhutan side agreed to repair/expand/renovate facilities including X-ray protection, distribution of electricity, securing the carry-in route for the smooth implementation of the Project. Once the equipment list is confirmed, Japanse side will support to make the renovation plan for the construction related to the large equipment such as Digital X-ray and Autoclave.

9-5. Ambulance

Bhutan side originally requested provision of the ambulances at several facilities, however, through the survey and discussions, both sides agreed that the ambulances are excluded from the scope of the Project because it was found difficult to procure the vehicles with specifications which can clear emission regulations in Bhutan.

9-6. Operation and Maintenance of the Equipment

(a) Importance of Operation and Maintenance

The Team explained the importance of operation and maintenance of the equipment under the Project considering that proper asset management is necessary to secure the life-span of the equipment and to reduce its maintenance cost. The Bhutan side

agreed to secure enough budgets necessary for appropriate operation and maintenance of the equipment including the additional purchase of the consumables and spare parts.

(b) Maintenance Contracts on Major Equipment

Both sides understand the necessity of covering maintenance service contracts for 5 years to the major equipment within components of the Grant Aid based on the assessment by the Team. The Bhutan side agreed to take necessary measures after expiry of guarantee period of the equipment and maintenance contracts by Japanese grant.

9-7. Soft component of the Project

Bhutan side requested technical assistance for operation and maintenance of the medical equipment as soft components of the Project. The Team agreed to examine the contents of their request further to verify the scope of the soft component program.

9-8. Gender Mainstreaming

Both sides confirmed that following gender elements shall be duly reflected in the scope of Preparatory Survey.

(a) Collection of information and gender disaggregated data for assessment of gender needs.

(b) Examination of gender-responsive measures based on the assessment, such as:

✓ Facility design, equipment plan and trainings that reflect gender-specific needs and consideration.

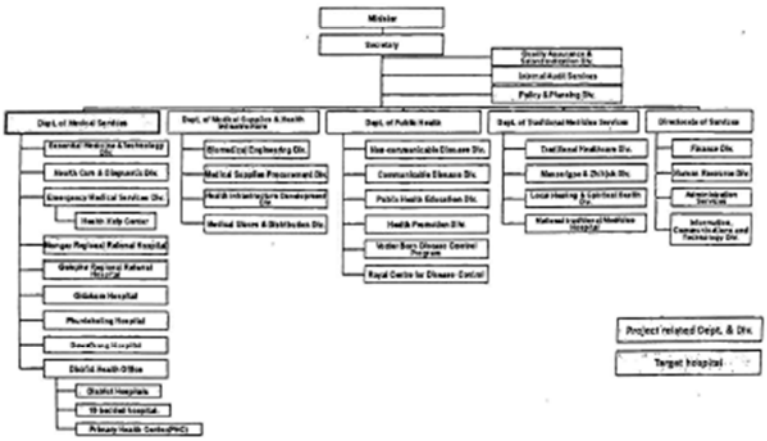
Annex 1 Project Site
Annex 2 Organization Chart
Annex 3 List of Equipment (tentative)
Annex 4 Japanese Grant
Annex 5 Project Monitoring Report (template)
Annex 6 Major Undertakings to be taken by the Government of Bhutan

Annex 1 Project Site

Target hospitals

District	Target Facilities
Mongar	65-bedded Gyaltsuen Jetsun Pema Mother and Child Hospital in Mongar(MCH)
	Eastern Regional Referral Hospital (ERRH)
	Gyelpoizhing 10 bedded Hospital
Trashigang	Trashigang District Hospital
	Riserboo General Hospital
	Bartsham 10 bedded Hospital
	Kanglung 10 bedded Hospital
	Khaling 10 bedded Hospital
	Rangjung 10 bedded Hospital
	Tsangpo 10 bedded Hospital
Trashiyangtse	Trashiyangtse District Hospital
	Khamdang 10 bedded Hospital
Lhuentse	Lhuentse District Hospital
Pemagatsel	Pemagatsel District Hospital
	Nganglam 10 bedded Hospital
Samdrup Jongkhar	Samdrup Jongkhar District Hospital
	Gomdar 10 bedded Hospital
	Samdrupcholing 10 bedded Hospital
	Jomotshangkha 10 bedded Hospital

Annex 2 Organization Chart



Annex3-1 Equipment list for MCH

	Name of equipment	Pediatric (NICU/PICU)	OBS/GYN	CHD	ER	Radiology	Operating Room	CSSD	Laboratory	Pharmacy	Total	Priority
1	Infant Incubator	2	1								3	A
2	Infant warmer A(with resuscitator)	4	2		1		1				8	A
3	Infant warmer B(without resuscitator)	5	1	1	1						8	A
4	Bubble CPAP	6	1								7	A
5	Highflow system	4									4	A
6	Patient Monitor A (with IBP, EtCO2)	10	5		1						16	A
7	Patient Monitor B	9	5	1	1						16	A
8	Patient Monitor C(Anaethesia)						3				3	A
9	Syringe pump	20	2		4		1				27	A
10	Infusion pump	18	7		4		1				30	A
11	Ventilator A (for neonate)	3									3	A
12	Ventilator B (for Adult&Peadiatric)	3			1						4	A
13	Transport incubator	1	2		2						5	A
14	Transport Ventilator	0			1						1	A
15	Infant Resuscitator	2	2		1						5	A
16	Phototherapy unit	5	4								9	A
17	Ultrasonic Nebulizer Machine	4	1	2	2						9	A
18	ECG Machine	1		1	1						3	A
19	Patient bed (ICU)	6									6	A
20	Defibrillator	2	1		1		1				5	A
21	Blood gas analyzer	1			1						2	A
22	Treadmill	1									1	B
23	Examination Light	4	2		1						7	A
24	Examination table	2	2	2	1	1					8	A
25	Delivery light		2								2	A
26	Obstetric table		2	2							4	A
27	Gynaecological examination table		1	2	1						4	A
28	Cardiotocography (CTG) monitor		7	2	1						10	A
29	Video colposcopy			1							1	A
30	LEEP Machine			1			1				2	A
31	Diathermy treatment system		1								1	B
32	TENS machine		1								1	B
33	Therapeutic ultrasound system		1								1	B
34	Vaccum Extractor		2								2	A
35	Suction unit	2	2		1		4				9	A
36	Digital X-ray machine					1					1	A
37	X ray film processor					1					1	A
38	Portable X-ray machine					1					1	A
39	Ultrasound machine A					2					2	A
40	Ultrasound machine B (Cardiovascular)					1					1	A
41	Ultrasound machine C (Anathesia)						1				1	A
42	Portable ultrasound machine		1			1					2	A
43	Operating light						3				3	A
44	Operating table						3				3	A
45	Electrosurgical unit						3				3	A
46	Anaesthesia machine						2				2	A
47	Laparascopy set						1				1	A
48	Hysterescopy set						1				1	A
49	Video laryngoscope				1		1				2	A
50	Steam sterilizer							2			2	A
51	Plasma sterilizer							1			1	A

Annex3-1 Equipment list for MCH

	Name of equipment	Pediatric (NICU/PICU)	OBS/GYN	CHD	ER	Radiology	Operating Room	CSSD	Laboratory	Pharmacy	Total	Priority
52	Surgical instrument washer							1			1	A
53	Ion-selective analyser								1		1	A
54	Distillation unit								2		2	A
55	Dry bath incubator								3		3	B
56	Biochemistry analyser								2		2	A
57	Barcode tube labelling system								2		2	B
58	Centrifuge A								4		4	A
59	Centrifuge B								1		1	A
60	Microscope								3		3	A
61	Refrigerator A								4		4	A
62	Refrigerator B									5	5	A
63	Feezer								2		2	A
64	Blood refrigerator								1		1	A
65	Cell washer								1		1	B
66	Haematology analyser								2		2	A
67	Coagulation analyzer								1		1	A
68	Vortex mixer								1		1	B

Annex3-2 Equipment list for ERRH, District, 10bed hospitals

No.	Name of Equipment	ERRH,Mongar	District/General Hospital						10 bedded Hospitals										Total	Priority
			Trashiyangtse	Pemagatshel	Lhuentse	Samdrup Jongkhar	Trashigang	Riserboo	Khamdang	Ngangtam	Khaling	Kanglung	Bartsham	Rangjung	Gomdar	Tsangpo	Samdrupcholing	Jomotshangkha	Gyalposhing		
1	Cardiotocography						2													2	A
2	Defibrillator		1	1	1	1	2	1												7	A
3	Ultrasound machine A		1	1	1	1	1													5	A
4	Digital X-ray machine	1																		1	A
5	X-ray film processor	1																		1	A
6	Obstetric table		1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	A
7	Infant warmer A(with resuscitator)		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	A
8	Steam sterilizer						1													1	A

Annex 4

JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or 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. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

I. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation
- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal
-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes
-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")
-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")
-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement
-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation
-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the 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 necessary for the implementation of the Project.

- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant 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 an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take 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 executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) 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 feasibility of the Project.

3. Basic Principles of Project Grants

(1) Implementation Stage

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 to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) 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 to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the

Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.

b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Measures to ensure more efficient implementation of the Grant

i) In the event that the E/N and the G/A concerning a project cannot be signed by the end of the following Japanese fiscal year of the cabinet decision concerned by the GOJ, the authorities concerned of the two Governments will discuss the cancellation of the project.

ii) In the event that the period, specified in the G/A, during which the grant is available expires before the completion of the disbursement, the authorities concerned of the GO J will thoroughly review the status, situation and perspective of the implementation of the project concerned before extending the said period. The authorities concerned of the two Governments will discuss the termination of the project including a refund, unless there are concrete prospects for its completion.

iii) Regardless of the period mentioned in ii) above, the authorities concerned of the two Governments will, in the event that five years have passed since the cabinet decision concerned by the GOJ before the completion of the disbursement, except as otherwise confirmed between them, discuss the termination of a project including a refund, unless there are concrete prospects for its completion.

4) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

5) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

PROCEDURES OF JAPANESE GRANT

Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2)Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3)Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

notes:

1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.

2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Financial Flow of Japanese Grant (A/P Type)

Annex 5
G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX
20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:
Executing Agency	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:
Line Ministry	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations
See Attachment 2.

2-4-2 Activities
See Attachment 3.

2-4-3 Report on RD
See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original *(at the time of outline design)*
Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks *(at the time of outline design)*

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

	Contingency Plan (if applicable):

Actual Situation and Countermeasures
(PMR)

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)

Monitoring sheet on price of specified materials

Attachment 6

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price B	Initial total Price C=A×B	Rate of Contract Price D	Condition of payment Price Decreased C×D	Price Increased C×D
1	Item 1						
2	Item 2	●● t	●	●	●	●	●
3	Item 3	●● t	●	●	●		
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month 2015	2nd ●month 2015	3rd ●month 2016	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

-
-
-

Attachment 7

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

Annex 6

Major Undertakings to be taken by the Government of Bhutan

1. Specific obligations of the Government of Bhutan which will not be funded with the Grant

(1) Before the Bidding

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To sign the banking arrangement (B/A) with a bank in Japan (the Agent Bank) to open bank account for the Grant	within 1 month after the signing of the G/A	MOH/GNHC		
2	To issue A/P to the Agent Bank for the payment to the consultant	within 1 month after the signing of the contract(s)	MOH/GNHC		
3	To bear the following commissions to the Agent Bank for the banking services based upon B/A		MOH/ GNHC		
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)		XX Nu	
	2) Payment commission for A/P	every payment		XX Nu	
4	To complete the construction work 75 % at 65 bedded Gyaltsuen Jetsun Pema Wangchuk Mother and Child Hospital, Mongar (MCH)	before notice of the bidding documents	MOH		
5	To submit a monthly progress report of the construction work for MCH	every month after the signing of the G/A			
6	To secure and clear the necessary space for installation of all the equipment in each target facilities other than MCH.	before notice of the bidding documents	MOH		
7	To submit Project Monitoring Report (with the result of Detailed Design)	before preparation of the bidding documents	MOH		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to the Agent Bank for the payment to the supplier and the contractor	within 1 month after the signing of the contract(s)	MOH		
2	To bear the following commissions to the Agent Bank for the banking services based upon the B/A		MOH/ GNHC		
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)		XX Nu	
	2) Payment commission for A/P	every payment		XX Nu	
3	To ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in the country of the Recipient	during the Project	MOH		
4	To accord Japanese physical persons and/or physical persons of third countries 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 country of the Recipient and stay therein for the performance of their work	during the Project			
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted.	during the Project			
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project			
7	To notify JICA promptly of any incident or accident, which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers.	during the construction	MOH		
8	To submit Project Monitoring Report after each work under the contract(s) such as shipping, hand over, installation and operational training.	within 1 month after completion of each work	MOH		
	To submit Project Monitoring Report (final) (including as-built drawings, equipment list, photographs, etc.)	within 1 month after issuance of Certificate of Completion for the works under the contract(s)	MOH		
9	To submit a report concerning completion of the Project	within 6 months after completion of the Project	MOH		
10	To submit a monthly progress report of the construction work for MCH	during the Project			
11	To provide and repair/expand/renovate facilities for distribution of electricity, X-ray protection and others.				
	1) Electricity a. The distribution power line to the site with electric power capacity required by the Project b. The drop wiring and internal wiring within the site c. The main circuit breaker and transformer	before installation of the equipment			
	2) X-ray protection To take necessary measures for the protection of X-ray				
	3) Others a. To complete expansion work at ERRH for the installment of the equipment. b. To secure the carry-in route of the equipment c. To install the air-conditioners if necessary				

12	To provide general furniture necessary for the implementation of the Project in the site(s)	after handing over	MOH		
13	To ensure the safety of persons engaged in the implementation of the Project	during the Project	MOH		

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To ensure that equipment will be maintained and used properly and effectively for the implementation of the Project	after handing over	MOH/ RCID		
2	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	after handing over	MOH/ RCID		
3	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	after handing over	MOH/ RCID		

4-2. Minutes of Discussions for DOD

Minutes of Discussions
on the Preparatory Survey for the Project for
Strengthening Health Care Services in Eastern Area
(Explanation on Draft Preparatory Survey Report)

With reference to the minutes of discussions signed between Ministry of Health and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on August 5, 2022 and in response to the request from the Government of Royal Government of Bhutan (hereinafter referred to as "Bhutan") dated June 13, 2019, JICA held a series of discussion online as the Preparatory Survey Team (hereinafter referred to as "the Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Strengthening Health Care Services in Eastern Area (hereinafter referred to as "the Project").

As a result of the discussions, both sides agreed on the main items described in the attached sheets.

Thimphu, September 21, 2022

Ms. Rie Sato
Leader, Preparatory Survey Team
Japan International Cooperation Agency
Japan

Mr. Pemba Wangchuk
Offtg. Secretary
Ministry of Health
Bhutan

Witnessed by

Mr. Tomoyuki Yamada
Chief Representative,
JICA Bhutan Office
Japan

Witnessed by

Mr. Tashi Penjor
Chief Planning Officer
Ministry of Health
Bhutan

1

ATTACHEMENT

1. Objective of the Project
   The objective of the Project is to improve health care services through the provision of medical equipment which are necessary to provide health care services for mothers and children to several medical facilities in the eastern area of Bhutan, thereby contributing to the strengthening of the health care system and the promotion of UHC in the area.

2. Title of the Preparatory Survey
   Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Strengthening Health Care Services in Eastern Area".

3. Project site
   Both sides confirmed that the sites of the Project are in health facilities in six districts in the eastern area (Mongar district, Trashigang district, Trashiyangtse district, Lhuentse district, Pemagatshel district and Samdrup Jongkhar district), which is shown in Annex 1.

4. Responsible authority for the Project
   Both sides confirmed the authorities responsible for the Project are as follows:
   The Ministry of Health will be the executing agency for the Project (hereinafter referred to as "the Executing Agency"). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be taken care by relevant authorities properly and on time. The organization charts are shown in Annex 2.

5. Contents of the Draft Report
   After the explanation of the contents of the Draft Report by the Team, the Bhutan side agreed to its contents. JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the Bhutan side around November 2022.

6. Cost estimate
   Both sides confirmed that the cost estimate explained by the Team is provisional and will be examined further by the Government of Japan for its approval.

7. Confidentiality of the cost estimate and technical specifications
Both sides confirmed that the cost estimate and technical specifications of the Project should never be disclosed to any third parties until all the contracts under the Project are concluded.

8. Procedures and Basic Principles of Japanese Grant
The Bhutan side agreed that the procedures and basic principles of Japanese Grant (hereinafter referred to as "the Grant") as described in Annex 3 shall be applied to the Project. In addition, the Bhutan side agreed to take necessary measures according to the procedures.

9. Timeline for the project implementation
The Team explained to the Bhutan side that the expected timeline for the project implementation is as attached in Annex 4.

10. Expected outcomes and indicators
Both sides agreed that key indicators for expected outcomes are as follows. The Bhutan side will be responsible for the achievement of agreed key indicators targeted in year 2027 and shall monitor the progress for Ex-Post Evaluation based on those indicators.
[Quantitative indicators]

Index (per year)	Baseline (2020)	Target (2027)
Number of deliveries at the target hospitals	1,923	2,250
Number of ultrasound examination at the 65-bedded Gyaltsuen Jetsun Pema Mother and Child Hospital in Mongar and the Eastern Regional Referral Hospital	7,996	9,500

[Qualitative indicators]
(a) To improve quality of comprehensive emergency obstetric care and neonatal intensive care
(b) To provide quality services at the target hospitals and reduction on physical and economic burden on pregnant women and newborns.

11. Ex-Post Evaluation
JICA will conduct ex-post evaluation after three (3) years from the project completion, in principle, with respect to five evaluation criteria (Relevance, Effectiveness,

Efficiency, Impact, Sustainability). The result of the evaluation will be publicized. The Bhutan side is required to provide necessary support for the data collection.

12. Technical assistance ("Soft Component" of the Project)

Considering the sustainable operation and maintenance of the products and services granted through the Project, following technical assistance is planned under the Project.

(a) Operation and maintenance of specific medical equipment

The Bhutan side confirmed to deploy necessary number of counterparts who are appropriate and competent in terms of its purpose of the technical assistance as described in the Draft Report.

13. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 5. With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in No.5 under (2) During the Project Implementation of Annex 5, both sides confirmed that such customs duties, internal taxes and other fiscal levies, which shall be clarified in the bid documents by MOH during the implementation stage of the Project.

The Bhutan side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage.

Both sides also confirmed that the Annex 5 will be used as an attachment of G/A.

14. Monitoring during the implementation

The Project will be monitored by the Executing Agency and reported to JICA by using the form of Project Monitoring Report (PMR) attached as Annex 6. The timing of submission of the PMR is described in Annex 5.

15. Project completion

Both sides confirmed that the project completes when all the equipment procured by the Grant are in operation. The completion of the Project will be reported to JICA promptly by the Executing Agency, but in any event not later than six months after completion of the Project.

16. Environmental and Social Considerations

The Team explained that 'JICA Guidelines for Environmental and Social Considerations (April 2010)' (hereinafter referred to as "the Guidelines") is applicable for the Project. The Project is categorized as C because the Project is likely to have minimal adverse impact on the environment under the Guidelines.

17. Other Relevant Issues

17-1. Disclosure of Information

Both sides confirmed that the Preparatory Survey Report from which project cost is excluded will be disclosed to the public after completion of the Preparatory Survey. The comprehensive report including the project cost will be disclosed to the public after all the contracts under the Project are concluded.

17-2. Gender Mainstreaming

Both sides confirmed that following gender elements shall be duly reflected in the scope of Preparatory Survey.

(a) Collection of information and gender disaggregated data for assessment of gender needs.
(b) Examination of gender-responsive measures based on the assessment, such as:
   ✓ Equipment plan that reflects gender-specific needs and consideration.

17-3. Construction of Gyaltsuen Jetsun Pema Mother and Child Hospital

The team explained that delay of the construction work of the 65 bedded Gyaltsuen Jetsun Pema Mother and Child Hospital, Mongar (hereinafter referred to as MCH), would affect the project implementation, and Bhutan side agreed that MCH will be completed 75% by the date of tender notice and that Bhutan side will bear any additional cost which may be caused by delay of the work. Bhutan side also agreed to submit the monthly progress report with pictures of MCH construction to JICA Bhutan Office. In addition, Bhutan side agreed that the medical equipment provided at MCH will be utilized as soon as possible after installation with proper preparation and training of the users.

17-4. Detailed Design and Cost Estimation

Both sides confirmed that Detailed Design and its cost estimation will be developed and updated by considering revised unit prices as well as foreign exchange-rates at Detailed Design stage in accordance with JICA's Guidelines for design and cost estimation, and that the alteration of project cost arisen from Detailed Design will be

subject to further discussions at the same stage.

17-5. Repair/Expansion/Renovation work for facilities

Bhutan side agreed to repair/expand/renovate facilities including X-ray protection, distribution of electricity, securing the carry-in route for the smooth implementation of the Project. Once the equipment list is confirmed, Japanese side will support to make the renovation plan for the construction related to the large equipment such as Digital X-ray and Autoclave.

17-6. Operation and Maintenance of the Equipment

(a) Importance of Operation and Maintenance

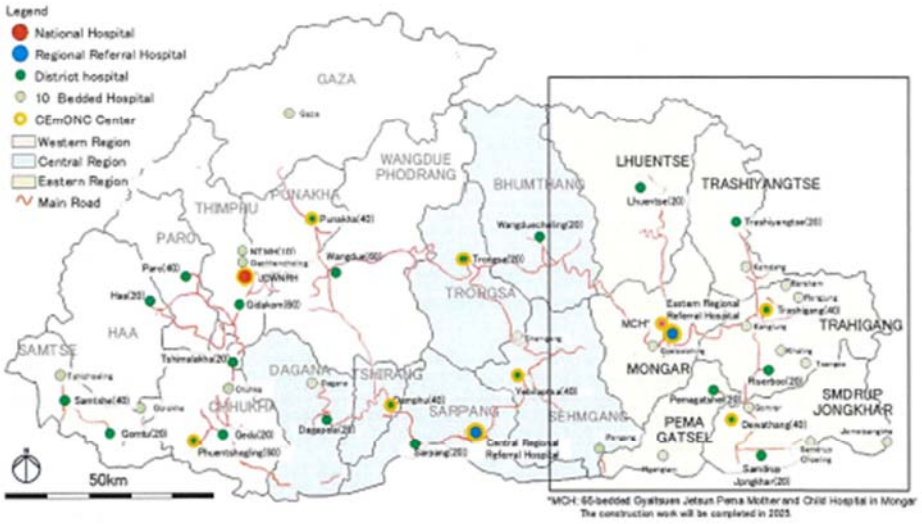
The Team explained the importance of operation and maintenance of the equipment under the Project considering that proper asset management is necessary to secure the life-span of the equipment and to reduce its maintenance cost. The Bhutan side agreed to secure enough budgets necessary for appropriate operation and maintenance of the equipment including the additional purchase of the consumables and spare parts.

(b) Maintenance Contracts on Major Equipment

Both sides understand the necessity of covering maintenance service contracts for 5 years to the major equipment within components of the Grant Aid based on the assessment by the Team. The Bhutan side agreed to take necessary measures after expiry of guarantee period of the equipment and maintenance contracts by Japanese grant.

Annex 1 Project Site
Annex 2 Organization Chart
Annex 3 Japanese Grant
Annex 4 Project Implementation Schedule
Annex 5 Major Undertakings to be taken by the Government of Bhutan
Annex 6 Project Monitoring Report (template)
Annex 7 Equipment list for MCH
Annex 8 Equipment list for ERRH, District, 10 bed hospitals

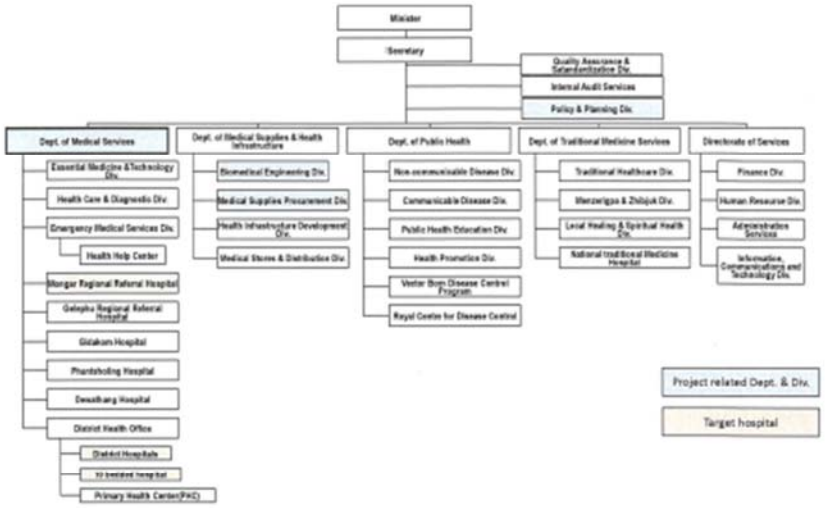
Annex 1 Project Site



Target hospitals

District	Target Facilities
Mongar	65-bedded Gyaltsuen Jetsun Pema Mother and Child Hospital in Mongar(MCH)
	Eastern Regional Referral Hospital (ERRH)
	Gyelpoizhing 10 bedded Hospital
Trashigang	Trashigang District Hospital
	Riserboo General Hospital
	Bartsham 10 bedded Hospital
	Kanglung 10 bedded Hospital
	Khaling 10 bedded Hospital
	Rangjung 10 bedded Hospital
	Tsangpo 10 bedded Hospital
Trashiyangtse	Trashiyangtse District Hospital
	Khamdang 10 bedded Hospital
Lhuentse	Lhuentse District Hospital
Pemagatsel	Pemagatsel District Hospital
	Nganglam 10 bedded Hospital
Samdrup Jongkhar	Samdrup Jongkhar District Hospital
	Gomdar 10 bedded Hospital
	Samdrupcholing 10 bedded Hospital
	Jomotshangkha 10 bedded Hospital

Annex 2 Organization Chart



Annex 3

JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or 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. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the 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 necessary for the implementation of the Project.

- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant 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 an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take 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 executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) 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 feasibility of the Project.

3. Basic Principles of Project Grants

(1) Implementation Stage

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 to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) 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 to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the

Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.

b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Measures to ensure more efficient implementation of the Grant

i) In the event that the E/N and the G/A concerning a project cannot be signed by the end of the following Japanese fiscal year of the cabinet decision concerned by the GOJ, the authorities concerned of the two Governments will discuss the cancellation of the project.

ii) In the event that the period, specified in the G/A, during which the grant is available expires before the completion of the disbursement, the authorities concerned of the GO J will thoroughly review the status, situation and perspective of the implementation of the project concerned before extending the said period. The authorities concerned of the two Governments will discuss the termination of the project including a refund, unless there are concrete prospects for its completion.

iii) Regardless of the period mentioned in ii) above, the authorities concerned of the two Governments will, in the event that five years have passed since the cabinet decision concerned by the GOJ before the completion of the disbursement, except as otherwise confirmed between them, discuss the termination of a project including a refund, unless there are concrete prospects for its completion.

4) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

5) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

PROCEDURES OF JAPANESE GRANT

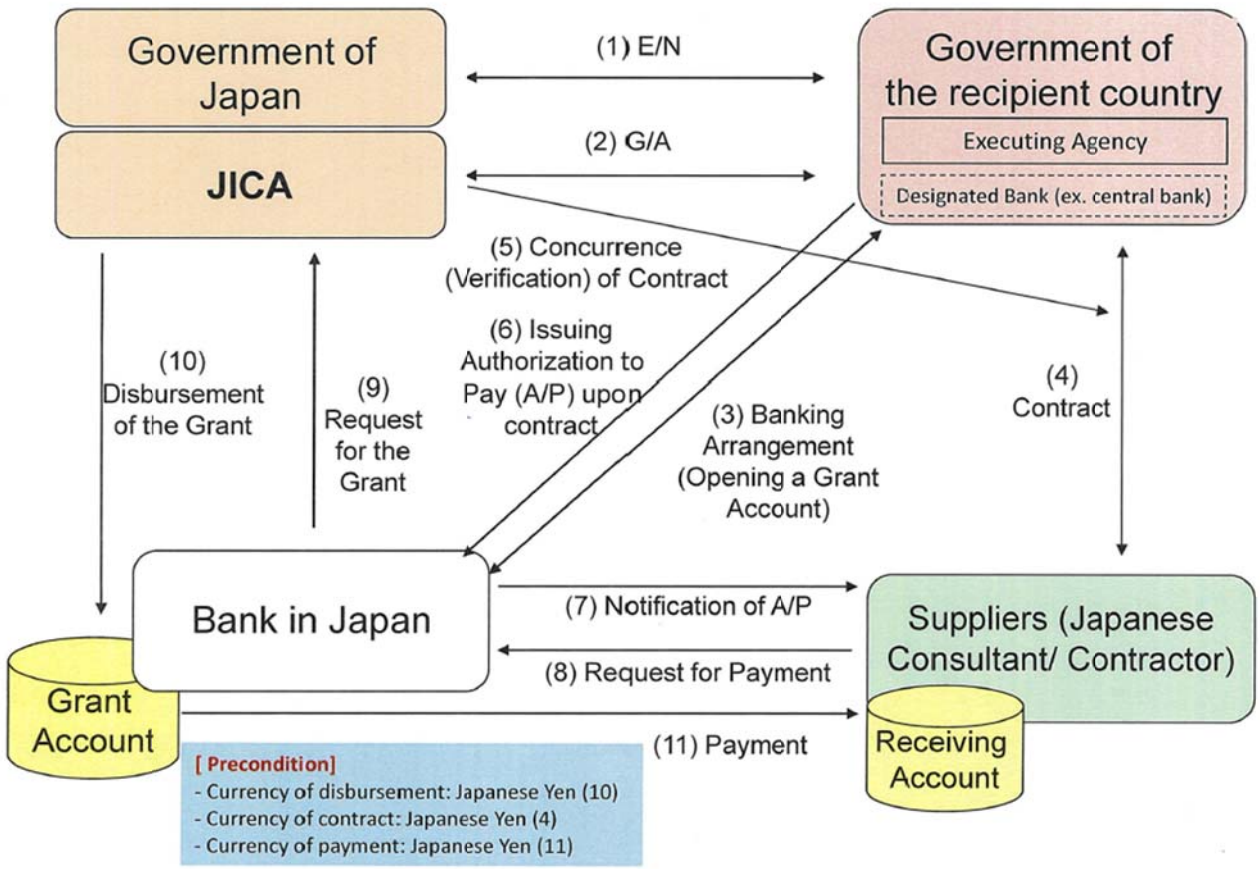
Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2)Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3)Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts.	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

notes:

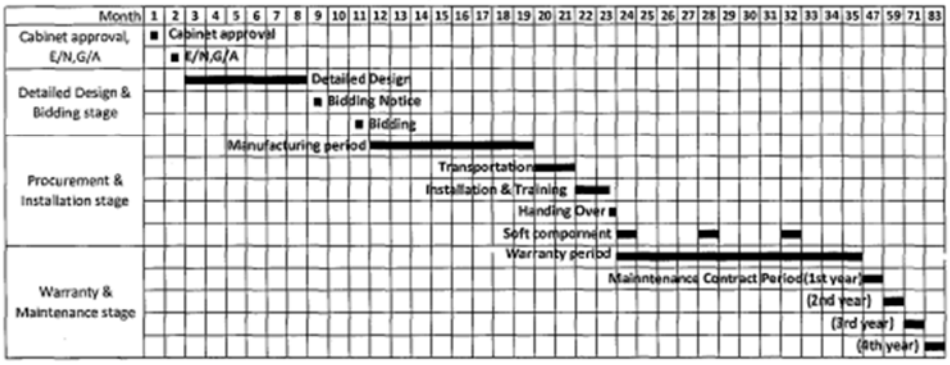
1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.

2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Financial Flow of Japanese Grant (A/P Type)



Annex4 Project Implementation Schedule



Annex 5

Major Undertakings to be taken by the Government of Bhutan

1. Specific obligations of the Government of Bhutan which will not be funded with the Grant

(1) Before the Bidding

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To sign the banking arrangement (B/A) with a bank in Japan (the Agent Bank) to open bank account for the Grant	within 1 month after the signing of the G/A	MOH/GNHC		
2	To issue A/P to the Agent Bank for the payment to the consultant	within 1 month after the signing of the contract(s)	MOH/GNHC		
3	To bear the following commissions to the Agent Bank for the banking services based upon B/A		MOH/ GNHC		
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)		200,000 Nu	
	2) Payment commission for A/P	every payment		3,000 Nu	
4	To complete the construction work 75 % at 65 bedded Gyaltsuen Jetsun Pema Wangchuk Mother and Child Hospital, Mongar (MCH)	before notice of the bidding documents	MOH		
5	To submit a monthly progress report of the construction work for MCH	every month after the signing of the G/A			
6	To secure and clear the necessary space for installation of all the equipment in each target facilities other than MCH.	before notice of the bidding documents	MOH		
7	To submit Project Monitoring Report (with the result of Detailed Design)	before preparation of the bidding documents	MOH		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to the Agent Bank for the payment to the supplier and the contractor	within 1 month after the signing of the contract(s)	MOH		
2	To bear the following commissions to the Agent Bank for the banking services based upon the B/A		MOH/ GNHC		
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)		1.9mill Nu	
	2) Payment commission for A/P	every payment		32,000 Nu	
3	To ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in the country of the Recipient	during the Project	MOH		
4	To accord Japanese physical persons and/or physical persons of third countries 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 country of the Recipient and stay therein for the performance of their work	during the Project			
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted.	during the Project			
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project			
7	To notify JICA promptly of any incident or accident, which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers.	during the construction	MOH		
8	To submit Project Monitoring Report after each work under the contract(s) such as shipping, hand over, installation and operational training.	within 1 month after completion of each work	MOH		
9	To submit Project Monitoring Report (final) (including as-built drawings, equipment list, photographs, etc.)	within 1 month after issuance of Certificate of Completion for the works under the contract(s)	MOH		
10	To submit a report concerning completion of the Project	within 6 months after completion of the Project	MOH		
11	To submit a monthly progress report of the construction work for MCH	during the Project			
12	To provide and repair/expand/renovate facilities for distribution of electricity, X-ray protection and others.	before installation of the equipment			
	1) Electricity a. The distribution power line to the site with electric power capacity required by the Project b. The drop wiring and internal wiring within the site c. The main circuit breaker and transformer				
	2) X-ray protection To take necessary measures for the protection of X-ray				
	3) Others a. To complete expansion work at ERRH and Trashigang hospital for the installment of the equipment. b. To secure the carry-in route of the equipment c. To install the air-conditioners if necessary				

13	To provide general furniture necessary for the implementation of the Project in the site(s)	after handing over	MOH		
14	To ensure the safety of persons engaged in the implementation of the Project	during the Project	MOH		

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To ensure that equipment will be maintained and used properly and effectively for the implementation of the Project	after handing over	MOH/ RCID		
2	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	after handing over	MOH/ RCID		
3	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	after handing over	MOH/ RCID		

2. Other obligations of the Government of Bhutan funded with the Grant

NO	Items	Deadline	Amount (Million Japanese Yen)*
1	To construct the facility and provide equipment 1) To conduct the following transportation a) Marine (Air) transportation of the products from Japan (the third country) to the country of the Recipient b) Internal transportation from the port of disembarkation to the project site	August 2024	
	2) To provide equipment with installation, commissioning and training		
2	To implement detailed design, bidding support and construction supervision (Consulting Service)		
3	Contingencies		
	Total		2

* The Amount is provisional. This is subject to the approval of the Government of Japan.

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX
20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:
Executing Agency	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:
Line Ministry	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1

1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations
See Attachment 2.

2-4-2 Activities
See Attachment 3.

2-4-3 Report on RD
See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original *(at the time of outline design)*
Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks *(at the time of outline design)*

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)
12. Report on the Management of Safety for Construction Works

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Attachment 6

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C－D	Price (Increased) F=C＋D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

-
-
-

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

Attachment 12

Report on the Management of Safety for Construction Works

Month/Year	Cumulative number of labor	Cumulative number of public accident	Cumulative hours worked	Number of deaths and injuries due to industrial accidents				Frequency rate	Severity rate
					Death and injuries	Aggregated number of calendar days absent	Aggregated number of work-days lost		
This Month				Death					
				More than 4 calendar days absent					
				1 to 3 calendar days absent					
				Total					
Total including this month				Death					
				More than 4 calendar days absent					
				1 to 3 calendar days absent					
				Total					

Note

1. Frequency rate is the frequency of occurrence of industrial accidents.
   Frequency rate = (Number of deaths and injuries due to industrial accidents ÷ Cumulative hours worked) × 1,000,000
2. Severity rate is degree of seriousness of the industrial accident.
   Severity rate = (Aggregated number of work-days lost ÷ Cumulative hours worked) × 1,000
3. Aggregated number of work-days lost = Aggregated number of calendar days absent ×(300÷365)
   Death (7,500 days) : death as a result of an industrial accident includes not only instantaneous death but also death as a result of occupational injury or disease.
4. Frequency rate and severity rate are rounding off the third decimal place.

Annex7-1 Equipment list for MCH

	Name of equipment	Pediatric (NICU/PICU)	OBS/GYN	CHD	ER	Radiology	Operating Room	CSSD	Laboratory	Pharmacy	Total	Priority
1	Infant Incubator	2	1								3	A
2	Infant warmer A(with resuscitator)	4	2		1		1				8	A
3	Infant warmer B(without resuscitator)	5	1	1	1						8	A
4	Bubble CPAP	6	1								7	A
5	Highflow system	4									4	A
6	Patient Monitor A (with IBP, EtCO2)	10	5		1						16	A
7	Patient Monitor B	9	5	1	1						16	A
8	Patient Monitor C(Anaethesia)						3				3	A
9	Syringe pump	20	2		4		1				27	A
10	Infusion pump	18	7		4		1				30	A
11	Ventilator A (for neonate)	3									3	A
12	Ventilator B (for Adult&Peadiatric)	3			1						4	A
13	Transport incubator	1	2		2						5	A
14	Transport Ventilator	0			1						1	A
15	Infant Resuscitator	2	2		1						5	A
16	Phototherapy unit	5	4								9	A
17	Ultrasonic Nebulizer Machine	4	1	2	2						9	A
18	ECG Machine	1		1	1						3	A
19	Patient bed (ICU)	6									6	A
20	Defibrillator	2	1		1		1				5	A
21	Blood gas analyzer	1			1						2	A
22	Treadmill	1									1	B
23	Examination Light	4	2		1						7	A
24	Examination table	2	2	2	1	1					8	A
25	Delivery light		2								2	A
26	Obstetric table		2	2							4	A
27	Gynaecological examination table		1	2	1						4	A
28	Cardiotocography (CTG) monitor		7	2	1						10	A
29	Video colposcopy			1							1	A
30	LEEP Machine			1			1				2	A
31	Diathermy treatment system		1								1	B
32	TENS machine		1								1	B
33	Therapeutic ultrasound system		1								1	B
34	Vaccum Extractor		2								2	A
35	Suction unit	2	2		1		4				9	A
36	Digital X-ray machine					1					1	A
37	X-ray film processor					1					1	A
38	Portable X-ray machine					1					1	A
39	Ultrasound machine A					2					2	A
40	Ultrasound machine B (Cardiovascular)					1					1	A
41	Ultrasound machine C (Anathesia)						1				1	A
42	Portable ultrasound machine		1			1					2	A
43	Operating light						3				3	A
44	Operating table						3				3	A
45	Electrosurgical unit						3				3	A
46	Anaesthesia machine						2				2	A
47	Laparascopy set						1				1	A
48	Hysterescopy set						1				1	A
49	Video laryngoscope				1		1				2	A
50	Steam sterilizer							2			2	A
51	Plasma sterilizer							1			1	A
52	Surgical instrument washer							1			1	A

Annex7-1 Equipment list for MCH

	Name of equipment	Pediatric (NICU/PICU)	OBS/GYN	CHD	ER	Radiology	Operating Room	CSSD	Laboratory	Pharmacy	Total	Priority
53	Ion-selective analyser								1		1	A
54	Distillation unit								2		2	A
55	Dry bath incubator								3		3	B
56	Biochemistry analyser								2		2	A
57	Barcode tube labelling system								2		2	B
58	Centrifuge A								4		4	A
59	Centrifuge B								1		1	A
60	Microscope								3		3	A
61	Refrigerator A								4		4	A
62	Refrigerator B									5	5	A
63	Feezer								2		2	A
64	Blood refrigerator								1		1	A
65	Cell washer								1		1	B
66	Haematology analyser								2		2	A
67	Coagulation analyzer								1		1	A
68	Vortex mixer								1		1	B

Annex7-2 Equipment list for ERRH, District, 10bed hospitals

No.	Name of Equipment	RRH	District/General Hospital						10 bedded Hospitals											Total	Priority
		ERRH,Mongar (M)	Tashigang(Tg)	Riserboo(Tg)	Tashiyangtse (Ty)	Lhuentse(L)	Samdrup,Jongkhar(SJ)	Pemagatshel(P)	Gyalposhing (M)	Kanglung (Tg)	Bartsham(Tg)	Rangjung(Tg)	Khaling(Tg)	Tsangpo (Tg)	Khamdang(Ty)	Gomdar(SJ)	Jomotshangkha (SJ)	Samdrupcholing(SJ)	Nganglam(P)		
1	Cardiotocography		2																	2	A
2	Defibrillator		2	1	1	1	1	1												7	A
3	Ultrasound machine A		1		1	1	1	1												5	A
4	Digital X-ray machine	1																		1	A
5	X-ray film processor	1																		1	A
6	Obstetric table		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	16	A
7	Infant warmer A		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	A
8	Steam sterilizer		1																	1	A

*M:Mongar District,Ts:Trashigang District,Ty:Tashiyangtse District,L:Lhuentse District, SJ:SamdrupJongkhar District, P:Pemagatshel district

** ERRH:Eastern Regional Referral Hospital,DH: District Hospital, GH:General Hospital, 10bed: 10 bedded Hospital