

**Ministry of Health
State of Eritrea**

**Basic Design Study Report
on
the Project for Improvement of
Regional Health Service
in
State of Eritrea**

June, 2007

Japan International Cooperation Agency

International Total Engineering Corporation

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PREFACE

In response to a request from the Government of State of Eritrea, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Regional Health Service in State of Eritrea and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Eritrea a study team from 12 January to 9 February 2007.

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

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

I wish to express my sincere appreciation to the officials concerned of the Government of State of Eritrea for their close cooperation extended to the teams.

June, 2007

Masafumi Kuroki
Vice President
Japan International Cooperation Agency

June, 2007

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Regional Health Service in State of Eritrea.

This study was conducted by International Total Engineering Corporation, under a contract to JICA, during the period from January, 2007 to June, 2007. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Eritrea and formulated the most appropriate basic design for the project under Japan's Grant Aid scheme.

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

Very truly yours,

Shigehito Akagi
Project Manager,
Basic design study team on the Project
for Improvement of Regional Health Service
in State of Eritrea
International Total Engineering Corporation

Summary

Summary

Situated in the northeast of the African continent, State of Eritrea (hereinafter referred to as “Eritrea”) has a population of 4.4 millions on the land of 121 thousand square kilometers. It is bordered by Sudan in the west, Ethiopia in the south, and Djibouti in the southeast. The east and northeast of the areas have an extensive coastline on the Red Sea. Asmara, the Eritrean capital with a population of 400 thousand, is in a highland 2,300 meter above sea level.

There are 358 health facilities (hospitals, health centers, health stations, clinics) in Eritrea, of which 220 facilities (61.5%) are under the MOH, 138 facilities are owned by private companies, churches or factories. There are total of 3,945 patient beds nationwide, of which 2,697 are in hospitals, 1,248 in health centers. One patient bed serves 830 Eritrean populations. At the top of the referral system are 6 national referral hospitals in Asmara, supported by regional (zonal) referral hospitals and sub regional (zonal) hospitals, as secondary facilities, and health centers, health stations and clinics, as primary facilities located in each 6 province.

Orrota school of medicine, established in 2003, is the only institution for training of doctor. It will start producing about 30 doctors per year as from 2009, being expected to sustain the Eritrean health sector that has as serious shortage of manpower. Before establishment of Orrota school, medical activities were performed by Eritrean doctors returned from abroad or contracted foreign doctors. College of nursing and health technology is the largest institution for training of health worker, and college of health science also produces health workers such as public health officer, clinical laboratory engineer, pharmacist, etc.

Eritrea, since its independence in 1993, had implemented various health programs based on the infrastructures established during the Ethiopian rule. Much of those health infrastructures, however, were devastated by the war against Ethiopia, which broke out in 1998 as a result of border demarcation of the both countries. After the war, the Eritrean Ministry of Health (hereinafter referred to as “MOH”) hammered out series of health programs which focused on improvement of primary health care, including restoration of war-damaged health centers and health stations. As a result of these programs, major health indicators have improved as people’s accessibility to primary health increased. Then, the MOH has embarked on improvement of secondary and tertiary health services as a major target of development. But they face many challenges, such as delay in renovation of health facilities in urban area, delay in procurement of medical equipment due to budgetary reasons. There also are so many secondary health facilities that can not provide proper health services to its people due to lack of medical staff.

Besides enormous efforts of the MOH, foreign governments or international organizations have played an important role in restoration of the post-war health infrastructures of Eritrea.

Unfortunately, much of medical equipment donated by those countries or organizations was used equipment, with no operation manuals, no maintenance manuals attached to it. This did not enhance the necessity of equipment management among the users. The users would not do the daily check-ups on equipment, repair and reuse it, more precisely, they just did not know how to manage and maintain the equipment. Now, to improve the situation of equipment maintenance, importance of BEU, which works for maintenance of medical equipment and training of maintenance staff, has become larger than ever before.

According to Interim Poverty Reduction Strategy Paper (I-PRSP) issued by MOH in 2004, “Health” is prioritized as one of the fields of human resource development, which is one of the 4 pillars of the strategy adopted by the I-PRSP. The I-PRSP focuses on development of primary and secondary health levels by adopting National Health Care Policy (NHCP) and Health Sector Strategy 2000.

MOH adopted Ten Year Health Sector Strategic Plan for 2005 – 2014, in which 19 specific areas for health strategies are listed. Procurement of medical equipment under the Project will strengthen such strategies as “Rehabilitate the different health facilities and construct new ones”, “Develop, organize and maintain the referral system in place” and “Provide basic clinical services in and outside the health facilities”, etc.

MOH had requested rehabilitation of 4 core regional hospitals, Biomedical Engineering Unit (BEU), which is responsible for maintenance of medical equipment in Eritrean public health facilities, 2 medical training centers and 3 satellite schools.

In response to this request, the Japanese government dispatched a preliminary study team from July to August 2006. The team confirmed that the MOH’s priority area of development was medical service. Based on the study results, the Japanese government decided to conduct a basic design study and dispatched a basic design study team for the period from January 12 to February 9, 2007. After the study team returned back to Japan, a basic design was drafted based on the survey results and discussions held with the persons in charge of the MOH, and subsequently, the Japanese government sent a study team for an explanation of the Draft Basic Design Study Report for the period from May 15 to 28, 2007.

Given the conditions and background as described so far, the following policies were adopted in making the equipment plan.

1. Halibet, Agordat, Massawa and Villagio Ginio hospitals shall be the target of procurement of the equipment under the Project, which are supposed to play a pivotal role in their regional health services as secondary hospitals but actually can not meet the expectation due to lack of or aging medical equipment. All of the 4 hospitals are excluded from the

existing equipment procurement plan by the MOH. Villagio Ginio hospital was opened in May 2006, to meet the need of the growing population in Asmara.

2. BEU shall be the target of procurement of the equipment under the Project, which is expected to play an important role in maintenance of medical equipment.
3. Technical assistance for management method of medical equipment maintenance shall be included as a soft component of the Project.
4. Halibet and Massawa hospitals have a plan to move to a new site. Considering importance those hospitals have in their regional health system, and considering lack of and aging medical equipment, those 2 hospitals shall be included in the Project. However, the Project shall target at their present activities and function. It shall not include their activities and function after transferring to a new site as there are no concrete plans are available at the survey.
5. The equipment shall meet the criteria such as purpose, necessity, technical level, management system, operation and maintenance system, maintenance cost. Outline of the planned equipment is shown below.

Outline of Major Equipment

Description	Q'ty	Purpose of use
Anesthesia machine, A	3	To give general anesthesia before operation, and use as ventilator for patient who is absence of spontaneous respiration during operation. For central piping.
Anesthesia machine, B	3	To give general anesthesia before operation, and use as ventilator for patient who is absence of spontaneous respiration during operation. For cylinder.
Autoclave, large	1	To sterilize various surgical instruments and lines with high-pressure steam.
Automatic film developer	1	To develop X-ray film.
Dental unit	2	To give dental checkup and care to patient.
Drill, electrical	1	To be used for drilling and reaming in orthopedic operation, such as complex fracture and bone tumor.
Electrical dermatome	1	To slice skin in order to make skin grafts on raw area and skin ulcer.
Endoscope set for lower digestive organs	1	To diagnose a disorder of the large intestine.
Endoscope set for upper digestive organs	1	To diagnose a disorder of the esophagus and the stomach.
Endoscope set, ENT	1	To diagnose a disorder of the nasal cavity.
Examination chair, ophthalmology	3	To diagnose a disorder of the anterior eye, such as vitreum and horny coat.
Generator, 150KVA	1	To be used as emergency power supply and standby power supply not to let life-support facilities go down during blackout.
Instrument set for major abdominal	8	To carry out major abdominal operation.
Operation table	8	To place patient in a suitable position for various operations.
Operation table,	2	To place patient in a suitable position for orthopedic operation.

Description	Q'ty	Purpose of use
orthopedic		
Patient monitor, A	1	To continue to monitor patient who is under general anesthesia and measure patient's vital sign in recovery room. Possible to measure IBP, CO2, and CO.
Patient monitor, B	4	To continue to monitor patient who is under general anesthesia and measure patient's vital sign in recovery room.
Ultrasound unit, color doppler	1	To be used for ultrasound diagnosis inside body, mainly for examination of pericardia, abdominal, and thyroid gland.
Ultrasound unit, B/W	3	To be used for ultrasound diagnosis inside body, mainly for examination of abdominal organ and thyroid gland.
X-ray unit, C-arm	1	To carry out fluoroscopy diagnosis in operation room. (Orthopedic and Urology)
X-ray unit, mobile	3	To carry out emergency and/or brief radiographic diagnosis for patient who is unable to walk.

Upon the signing of the Exchange of Notes (E/N) between the Government of Eritrea and the Government of Japan, the work shall be executed in accordance with the Japanese grant aid framework. The work is estimated to require 15 months, including 5 months for detail design, 9 month for equipment procurement and 2 months for technical assistance which will be implemented before and after installation of the equipment.

Implementation of the Project will benefit 601 thousand people in Maakel, 150 thousand in Gash Barka, 35 thousand in Massawa, Northern Red Sea, total 786 thousand people living in the target areas. The Project will strengthen the secondary health service providing system, and it will produce the following output.

1. The number of operation, radiological diagnosis, laboratory test and delivery per year will increase in each target hospital, and the number of repair per year will increase in BEU, through procurement of medical, testing and training equipment.
2. BEU will be able to draft a spare parts/consumables procurement plan by themselves and to conduct a workshop for instruction of preventive equipment maintenance targeted at hospital staff, through implementation of the technical assistance as a soft component of the Project

Use of the Japanese grant for this Project is judged appropriate for the following reasons.

1. The Project will directly benefit total of 786 thousand people in the target areas through strengthening medical function of the target facilities. Consequently, as those target hospitals are core health facilities for each region, all the population of the zones in which target hospitals are located will indirectly benefit through completion of the referral system as a result of improvement of the medical function in the target hospitals.

2. Poverty reduction is the largest challenge facing the country. According to the I-PRSP, improvement in health indicators is one of the important indicators of economic development, suggesting economic development is based on the improvement in quality of health services provided for the people. Primary and secondary services are especially prioritized in the I-PRSP. The Project targets at the secondary facilities to strengthen the foundation for poverty reduction strategy of Eritrea. Procurement of equipment for BEU will indirectly support improvement of the secondary health service by strengthening the maintenance ability of BEU.
3. The equipment procured under the Project will be used effectively because they are planned according to the existing operation systems, because the equipment for Villagio Ginio hospital were planned according to the staff allocation list affirmed by the MOH, because the equipment are appropriate to the technical level of the existing facilities and there are no equipment which requires huge running cost, and because no equipment which require installation work is planned for the hospitals with future moving plan.

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LOCATION MAP



SKETCH MAP OF STATE OF ERITREA

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ABBREVIATIONS

Abbreviation	Original Name
A/P	Authorisation to Pay
B/A	Banking Arrangement
B/W	Black-and-white
BEU	Biomedical Engineering Unit
BS	British Standard
D&C	Dilation and Curettage
DC	Dry-cell Batteries
DIN	Deutsche Industrie Normen
E/N	Exchange of Notes
ECG	Electrocardiogram
ENT	Ear, Nose, and Throat
JIS	Japan Industrial Standard
LCD	Liquid Crystal Display
MOH	the Eritrean Ministry of Health
NKF	Eritrean Nakfa
OB/GY	Obstetric and Gynecology
OPD	Outpatient Department
UL	Underwriters Laboratories
UNICEF	United Nations International Children's Emergency Fund

Chapter 1. Background of the Project

Chapter 1 Background of the Project

1-1 Background and outline of the Project

(1) Background of the Project

Eritrea, since its independence in 1993, had implemented various health programs based on the infrastructures established during the Ethiopian rule. Much of those health infrastructures, however, were devastated by the war against Ethiopia, which broke out in 1998 as a result of border demarcation of the both countries. After the war, the Eritrean Ministry of Health (hereinafter referred to as “MOH”) hammered out series of health programs which focused on improvement of primary health care, including restoration of war-damaged health centers and health stations. As a result of these programs, major health indicators have improved as people’s accessibility to primary health increased. Then, the MOH has embarked on improvement of secondary and tertiary health services as a major target of development. But they face many challenges, such as delay in renovation of health facilities in urban area, delay in procurement of medical equipment due to budgetary reasons. There also are so many secondary health facilities that can not provide proper health services to its people due to lack of medical staff.

Besides enormous efforts of the MOH, foreign governments or international organizations have played an important role in restoration of the post-war health infrastructures of Eritrea. Unfortunately, much of medical equipment donated by those countries or organizations was used equipment, with no operation manuals, no maintenance manuals attached to it. This did not enhance the necessity of equipment management among the users. The users would not do the daily check-ups on equipment, repair and reuse it, more precisely, they just did not know how to manage and maintain the equipment. Now, to improve the situation of equipment maintenance, importance of BEU, which works for maintenance of medical equipment and training of maintenance staff, has become larger than ever before.

According to Interim Poverty Reduction Strategy Paper (I-PRSP) issued by MOH in 2004, “Health” is prioritized as one of the fields of human resource development, which is one of the 4 pillars of the strategy adopted by the I-PRSP. The I-PRSP focuses on development of primary and secondary health levels by adopting National Health Care Policy (NHCP) and Health Sector Strategy 2000.

MOH adopted Ten Year Health Sector Strategic Plan for 2005 – 2014, in which 19 specific areas for health strategies are listed. Procurement of medical equipment under the Project will strengthen such strategies as “Rehabilitate the different health facilities and construct new ones”, “Develop, organize and maintain the referral system in place” and “Provide basic clinical services in and outside the health facilities”, etc.

In response to this situation, the MOH had requested rehabilitation of 4 core regional hospitals, Biomedical Engineering Unit (BEU), which is responsible for maintenance of medical equipment in

Eritrean public health facilities, 2 medical training centers and 3 satellite schools.

According to this request, Japanese government decided to implement a preliminary study from July to August in 2006, and the study team confirmed that Government of Eritrea gave the high priority to health care field. Based on the survey results, Eritrea requested the government of Japan the procurement of medical equipment for 4 secondary hospitals and BEU, and technical assistance for BEU as a soft component of the Project.

(2) Outline of the Request

Outline of the Request is procurement of medical equipment to BEU, Halibet Hospital, Agordat Hospital, Massawa Hospital, and Villagio Ginio Hospital. Contents of the Request is as follows.

Table 1-1 Outline of Requested Equipment

Facilities	Department	Major Equipment
Halibet Hospital	Operation theater	Echocardiogram unit, ECG, Defibrillator with ECG monitor, Patient monitor with oxymeter, Blood gas analyzer, Endoscope, Colonoscope, Anesthesia machine, Operation light, mobile, Cautery unit, Autoclave, X-ray unit, C-arm, Operation table, etc.
	Imaging Diagnosis and Radiology	X-ray unit, general, Ultrasound unit, etc.
	Laboratory	Centrifuge, Drying oven, Distiller, Refrigerator, Microscope binocular, ELISA machine, Haematology analyzer, etc.
	ENT	Microscope ENT, Telescope set, etc.
	Burn	Electrical dermatomes, etc.
	Orthopedic	Operation table, Gypsum cutter, etc.
	Dental	Dental unit, etc.
	Others	Solar panel, Generator, 150KVA, etc.
	Diabetes Therapy	Physiotherapy equipment set, etc.
	Total: 41 items	
Agordat Hospital	Operation theater	Operation table, Operation light mobile, Cupboard drug, ECG, Anesthesia machine, Cautery unit, etc.
	Emergency Department	Patient monitor, Defibrillator with ECG monitor, Emergency cart, Pulse oxymeter, Examination light mobile, Oxygen concentrator, etc.
	Imaging Diagnosis and Radiology	X-ray unit C-arm, Dark room equipment, etc.
	Laboratory	Microscope binocular, Haematology analyzer, Centrifuge, Drying oven, etc.
	General	Refrigerator, Examination light mobile, etc.
	Physiotherapy	Physiotherapy unit, Shortwave therapy unit, Infrared lamp, Exercise mat, Traction table, Parallel bars, etc.
	Gynecology and Obstetrics	Delivery bed, Ultrasound unit B/W, Autoclave, Vacuum extractor, Infant incubator, Infant warmer, etc.
	Dental	Dental unit, X-ray unit dental, etc.
	Ophthalmology	Slit lamp, Examination chair eye, Refractometer, Tonometer, Operation microscope, etc.
	Others	Laundry machine, Solar panel, etc.
	Total: 87 items	
Massawa Hospital	Operation theater	Operation light mobile, Operation table, ECG, Defibrillator, Pulse oxymeter, Oxygen concentrator, Cautery unit, Autoclave, etc.
	Emergency Department	Patient monitor, Infusion pump, Lung function tester, etc.
	Imaging Diagnosis and Radiology	X-ray unit, general, Automatic developer, Ultrasound unit, B/W, etc.
	Laboratory	Microscope binocular, Haematology analyzer, Centrifuge, Drying oven, etc.
	Ophthalmology	Operation microscope, Slit lamp, Examination chair ophthalmology, Retinoscope, Refractometer, Tonometer, etc.

Facilities	Department	Major Equipment
	Dental	Amalgam mixer, Dental unit, X-ray unit dental, etc.
	Others	Generator 150KVA, Solar panel, etc.
	Total: 60items	
Villagio Ginio Hospital	Operation theater	Operation table, Operation light mobile, Cupboard drug, Anesthesia machine, Nebulizer, Cautery unit, Surgical instrument set, Drying oven, etc.
	Gynecology and Obstetrics	Delivery bed, Doppler Ultrasound Fetal heart beat detector, Ultrasound unit B/W, Operation light, mobile, Vacuum extractor, Infant incubator, Infant warmer, etc.
	Imaging Diagnosis and Radiology	X-ray unit mobile, Dark room equipment, etc.
	Dental	Amalgam mixer, Dental unit, X-ray unit dental, Autoclave dental etc.
	Ophthalmology	Slit lamp, Examination chair eye, Trial lens, Retinoscope, Ophthalmoscope, etc.
	Emergency Department	Instrument set, Emergency cart, etc.
	Physiotherapy	Shortwave therapy unit, Infrared lamp, Ultrasound therapy unit, Exercise mat, Traction table, Physiotherapy unit mobile, etc.
	Laboratory	Drying oven, Refrigerator, Microscope binocular, Automatic chemistry analyzer, Centrifuge, Haematology analyzer, etc.
	General	Drying oven, Examination light mobile, etc.
	Others	Generator 150KVA, Solar panel, etc.
Total: 83items		
For four hospitals	Operation theater	Instruments theater cesarean section extras, Instruments, theater gynecology extras, Instruments, theater tracheotomy extras, Instruments theater basic major, Instruments theater basic minor, etc.
	Total: 5items	
BEU		Oscilloscope 100Mhz, Digital multimeter with high voltage probe and temperature probe, Radiation detector X-ray, etc.
	Total: 50items	

1-2 Natural Conditions

Overall nation land mostly belongs to tropical dry climate; however, there are various climatic provinces in Eritrea because of its highly-diverse landforms. Asmara, capital city of Eritrea, is at a height of 2,300 meters above sea level, so temperature does not change drastically all through the year. BEU, Halibet hospital, and Villagio Ginio hospital are located in Asmara. Rainy season is from July to August, but annual rainfall is just around 500mm. Gash Barka Province, where Agordat hospital is located, is at height of 700 to 800 meters above sea level, and belongs to dry district. Northern Red Sea province, where Massawa hospital is located, belongs to hot-arid climate, and the average annual temperature is over 30 degree. Especially, the average temperature of July and August is over 40 degree. Annual rainfall in Northern Red Sea province is 183mm, and it is one-eighth of annual rainfall in Tokyo (1,467mm). Monsoon from the sea causes high humidity, and it is 67%, which is almost same percentage of the average in Tokyo (63%).

Table 1-2 shows the temperature and rainfall amount in Asmara and Massawa.

Table 1-2 Temperature and Rainfall Amount in ASMARA and MASSAWA

ASMARA				MASSAWA			
Month	Temperature ()		Rainfall Amount (mm)	Month	Temperature ()		Rainfall Amount (mm)
	Lowest	Highest			Lowest	Highest	
January	5.6	22.6	2.1	1?	24.0	29.9	30.2
February	6.7	23.9	2.1	2?	24.1	29.3	26.1
March	8.5	25.1	12.2	3?	25.2	31.6	13.8
April	9.9	24.5	35.7	4?	27.0	34.7	11.3
May	10.9	25.2	41.9	5?	28.5	37.4	6.3
June	11.2	25.1	41.6	6?	31.3	39.8	0.1
July	11.4	21.8	173.7	7?	32.8	40.8	6.7
August	11.4	21.6	165.2	8?	32.7	40.6	7.6
September	8.7	23.2	25.4	9?	31.2	39.5	3.3
October	8.8	21.8	12.1	10?	29.7	38.3	16.8
November	7.5	21.6	16.8	11?	27.0	34.2	21.0
December	6.2	21.7	3.7	12?	26.0	30.0	39.9
		Annual Rainfall	532.5			Annual Rainfall	183.1

Source : World Weather Information Services, etc.

1-3 Social and Environmental Issues

There is environmental concern regarding waste water drained from medical facilities. There are no distinction among laboratory wasted water, developer and fixer solution of x-ray film and normal sewage water released into the sea. Medical wastes are also incinerated together with normal wastes, which may be harmful to the soil if dioxin is generated. The Basic Design Study team suggested that there was environmental concern with the use of some of the medical equipment under the Project since they may generate medical wastes, and that under the present system of waste treatment the medical equipment under the Project might increase environmental load.

To cope with this problem, the Eritrean Ministry of Health drafted National Health-Care Waste Management Plan in May, 2003, in which industrial and medical wastes shall be treated separately. They also make a concept of sewage treatment plants to release chemically treated medical wastewater into river. The MOH is also positive about taking concrete measures against incineration of medical wastes, although the medical equipment under the Project could not directly cause dioxin generation or air pollution.

Chapter 2. Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Objectives of the Project and its Overall Goals

State of Eritrea, since its independence in 1993, had implemented various health programs based on the infrastructures established during the Ethiopian rule. Much of those health infrastructures, however, were devastated by the war against Ethiopia, which broke out in 1998 as a result of border demarcation of the both countries. After the war, the MOH hammered out series of health programs which focused on improvement of primary health care, including restoration of war-damaged health centers and health stations. As a result of these programs, major health indicators have improved as people's accessibility to primary health increased. Then, the MOH has shifted the target of development from primary services to improvement of secondary and tertiary services. But they face many challenges, such as delay in renovation of health facilities in urban area, delay in procurement of medical equipment due to budgetary reasons. There also are so many secondary health facilities that can not provide proper health services to its people due to lack of medical staff.

Besides enormous efforts of the MOH, foreign governments or international organizations have played an important role in restoration of the post-war health infrastructures of Eritrea. Unfortunately, much of medical equipment donated by those countries or organizations was used equipment, with no operation manuals, no maintenance manuals attached to it. This did not enhance the necessity of equipment management among the users. The users would not do the daily check-ups on equipment, repair and reuse it, more precisely, they just did not know how to manage and maintain the equipment. Now, to improve the situation of equipment maintenance, importance of BEU, which works for maintenance of medical equipment and training of maintenance staff, has become larger than ever before.

Facing those difficult challenges, the MOH drafted 10-year Strategic Plan for Health Sector Development, which focuses on renovation and new construction of medical facilities, establishment of appropriate referral system, providing proper health services, providing emergency services including emergency operation, etc. Among those objective, this Project will help establish secondary health service providing system.

2-1-2 Outline of the Project

Table 1-1~3 show status of secondary and tertiary health sector development promoted by the MOH. 6 tertiary facilities are in Asmara, Maakel province, including Orrota National Referral Hospital which was constructed by Chinese assistance in 2006. Rehabilitation programs for other tertiary hospitals are also in progress with either MOH budget or foreign assistance.

There are 6 zonal referral hospitals and 14 sub-zonal referral hospitals. All of them were rehabilitated by the MOH or foreign assistance by 2006 or are scheduled to be rehabilitated in 2007 to 2008, except for the 4 secondary hospitals under this Project. There are no plans for rehabilitation for those hospitals.

As indicated in the Table 1-2 and 1-3, no rehabilitation programs have been implemented for the 4 secondary hospitals under the Project. Their medical equipment are so old that they have difficulties in continuing provision of proper medical activities. Therefore, the 4 hospitals were selected and given high priority by the MOH.

Table 2-1 Status of Development of National Referral Hospital (Tertiary Level)

Province	Hospital	Status
Maakel	Orotta (Internal medicine, Surgery)	Construction and rehabilitation were completed with the assistance of Government of China in 2006.
	Orotta (Obstetrics)	Expansion plan was finalized with the 2006 fund of Hammer Forum (Germany).
	Orotta (Pediatric)	Plan for setting private electric generator and lift was finalized with the 2006 fund of local city in Italy.
	Berhan Aynee (Ophthalmology)	Expansion and renovation are planned with the government budget for 2007. (Budget amount is not decided)
	St. Mary (Psychiatry)	Renovation is planned with 2007 government budget. (About 510,000 Nakfa)
	Hansenian	No plan

Table 2-2 Status of Development of Zonal Referral Hospital (Secondary Level)

Province	Hospital	Status
DKB	Assab	Construction and equipment procurement are finalized with the 2006 government budget.
SKB	Ghinda	Construction and equipment procurement were completed with the assistance of Government, Italy, UNFPA.
Anseba	Keren	Construction is planned in 2007. (Donor might be World Bank, budget amount is not decided.)
Gash Barka	Barentu	Construction and procurement of equipment were completed with the assistance of World Bank in 2006.
Debub	Mendefera	Construction and procurement of equipment were completed with the assistance of World Bank in 2006.
Maakel	Halibet	Burn injury treatment center is under construction with the 2006 government budget. New hospital construction is planned in the premises with the 2007 government budget. (Budget amount is not decided.)

Table 2-3 Status of Development of Sub-zonal Referral Hospital (Secondary Level)

Province	Hospital	Status
DKB	-	No plan of construction
SKB	Massawa	Relocation of hospital is planned with the 2007 government budget. (Budget amount is not decided.)
	Afavet	Renovation was completed with the assistance of Government of France.
	Nakfa	Renovation plan was finalized with the 2006 government budget.
Anseba	Tio	Rehabilitation of equipment was completed with the assistance of Government of Italy.
Gash Barka	Agordat	-
	Tesenei	Priority on rehabilitation of facilities and equipment is low because main disorder of this area is tuberculosis and malaria.
Debub	Adikeyh	Expansion and procurement of equipment were completed with the assistance of Government of France.
	Adiquala	Same as above
	Dekemhare	Renovation was completed with the 2003-2004 government budget and assistance of Government of Swiss.

	Senafe	Renovation is planned in 2007. (Donor might be EU, items are not decided.)
Maakel	Villagio Ginio	Out-patient clinic, hospital ward, service for mother and child, kitchen, and laundry were constructed in 2006. Operation ward and X-ray ward are under construction with the budget of MOH at this moment.
	Hazhaz	Renovation is planned with 2008 government budget. (Budget amount is not decided.)
	Edaga Hamus	Renovation is planned with 2008 government budget. (Budget amount is not decided.)
	Godaiif	No plan because condition of current equipment is good.
	Denden	Renovation is planned with 2007 government budget. (About 1,200,000 Nakfa)

The 4 hospitals selected out of 26 facilities nationwide cover total of 786 thousand people, which is as much as 18% of the Eritrean population (4.4 million, 2004).

This Project aims at strengthening of medical functions of selected secondary hospitals, improvement of skill of medical equipment maintenance and repair for BEU, and improvement of educational skill of equipment maintenance for BEU.

The Project will help establish secondary health care providing system in Eritrea, improve diagnostic and treatment functions of the targeted hospitals which support primary health facilities within the primary health care strategy of Eritrea. The requested Japanese assistance will;

- Procure inspection and repair equipment for BEU and give technical assistance by consultant (Soft Component) regarding medical equipment management method.
- Procure medical equipment for Halibet hospital
- Procure medical equipment for Agordat hospital
- Procure medical equipment for Massawa hospital
- Procure medical equipment for Villagio Ginio hospital

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Policy

In response to the request made by the Eritrean government, and based on the surveys and discussions held between the two governments, it was decided that the following policies below shall be adopted for implementation of the requested Japanese assistance so that it may help strengthen the secondary health providing system of Eritrea.

As already explained and shown in the table 2-1 to 2-3, series of rehabilitation plans were already implemented or scheduled to be implemented for many health facilities. There are, however, no rehabilitation plans for the 4 secondary hospitals which is the target site of the Project. Medical activities in the 4 hospitals are sometimes hindered by lack of or aging medical equipment. Thus, it is important to procure equipment for those facilities considering the importance in strengthening the secondary health providing system and, consequently, completion of the referral system of Eritrea.

1) Target Facilities

The Requested Japanese Assistance shall assist the equipment plan which is a part of rehabilitation plan drafted by MOH for secondary hospitals and shall target Halibet, Massawa, Agordat and Villagio Ginio Hospital, and shall also cover equipment procurement for BEU, which is responsible for maintenance of medical equipment for public hospital in Eritrea.

There are plans to move the facilities of Halibet and Massawa hospitals in the future. The requested Japanese assistance shall cover those 2 hospitals considering their importance in its secondary health providing system in each region and the fact that they have not fully played its referral role that they are supposed to play due to the situation in which the activities of those hospitals were often hindered by lack of and aging medical equipment. But the Requested Japanese Assistance can not include the facilities after moving to the new sites because the Basic Design Study team could not confirm the detail schedule and the budget. Therefore, the requested Japanese assistance shall instead the current activities of existing facilities, in which the equipment planning shall be based upon the present activities and shall be coexistence with the movement plans. For this purpose, the equipment for those hospitals shall be movable and reinstallable, and the minimum necessary quantity of equipment shall be planned. Function and scale of the facilities after move shall also be considered in the equipment planning.

2) Contents of Equipment

The contents of equipment shall be based upon the positioning of the facilities, activities of the target facilities as well as related facilities, technical level, financial capacity, etc. All those factors shall be comprehensively considered so that the equipment shall be consistent with the functions of the facilities. Priority in equipment planning shall be as follows.

The equipment for Halibett and Massawa hospitals, which plans to move to new sites, shall be

both consistent with the present activities and relevant to the secondary health services after move. The equipment that are not susceptible to move shall be selected.

Table 2-4 Principle of Equipment Selection

	Principle of priority
Included in the assistance	Equipment regarding central medical care function, such as operations, emergency outpatient, radiology, and laboratory
	Equipment which need to be renewed because they are too old
	Equipment which are short of quantity
	Equipment which are easily managed and maintained
	Equipment with large beneficiary effects for hospital and community
Excluded from the assistance	Equipment which require large amount of maintenance cost
	Equipment which require advanced techniques
	Equipment which do not fit in the basic infrastructure of Eritrea, such as building, water supply, and electricity supply
	Equipment which have difficulty with procurement of spare parts / consumables in Eritrea or its neighboring countries
	Equipment which are relatively inexpensive and can be procured by the recipient side
	Equipment which require fixed installation and cannot be removed (Facilities which have relocation plan)
	Equipment which are harmful to the environment
	Equipment with little beneficiary effects for hospital and community
	Equipment for personal use by hospital staff
	Equipment which can be alternated with other equipment
	Equipment with no plan for human resource at this moment

(2) Policy for Environment Condition

Generator shall be installed in an outdoor house with roof, as the study team noticed a generator placed outdoor without roof in one of the target hospital.

(3) Policy for Socioeconomic Condition

After independence from Ethiopia in 1993, construction of the state was going well with average annual economic growth of 7%, until the border conflict with Ethiopia in 1998. The conflict developed into a war and devastated social infrastructures such as bridge, road, school, hospitals, and created more than a million of refugee. There was also a series of drought from 1998 to 2003, which resulted in sharp drop of food production. Crop production in 2002 was as much as one fourth of that of the average of the past 10 years, and more than 60% of Eritrean people faced a serious food shortage.

The requested Japanese assistance shall take the modern history of Eritrea as described above into consideration and it shall aim at reducing technological and financial burdens that Eritrea faces as a result of shortage in material and human resources.

(4) Policy for Procurement

In principle, procured equipment shall be the products of Japan or Eritrea. Equipment from third countries shall also be considered on the conditions that they are widely used in Eritrea, as well as with advantage in price and maintenance. Procurement of equipment from third countries shall be approved by the governments of Japan and Eritrea. For other equipment, advantage in price and availability shall be considered.

For the equipment that need periodical checkup, maintenance by manufacturers, or the equipment that need consumable or spare parts, they shall be procured from manufacturers that have local agents in Eritrea or neighboring countries, so that the procured equipment may be used efficiently and for a long period of time. The maintenance role of BEU shall also be considered in equipment planning.

(5) Policy for Operation and Maintenance

Maintenance skill is not enough at each hospital, therefore BEU is responsible for maintenance of medical equipment for almost all of the medical facilities. BEU has been doing maintenance work for the medical equipment donated from foreign countries with limited budget and tools, so it can be said that maintenance skill of BEU in medical equipment is sufficient. However, importance in daily checkups or preventive maintenance of equipment is not recognized not only by hospitals staff but by BEU staff. Therefore, instruction for management method of equipment maintenance shall be necessary for BEU as a soft component of the Project.

(6) Policy for Equipment Grade, Specification, Quantity

Procured equipment shall not be only appropriate for standard level of secondary hospital in Eritrea, but they shall also reflect local needs and actual situations of health services. For BEU, as there are mainly repair / inspection department and training department, the equipment shall be appropriate for the level of each department. Renewal of existing equipment shall be prioritized over new equipment procurement which would require huge maintenance cost.

Certain quantity of consumables and spare parts shall be included for initial use before the MOH establishes the procurement system of consumables and spare parts. Assuming it will take 6 months to foresee required quantity after procurement of equipment under the Project, and assuming 4 months necessary for ordering and import procedures, the requested Japanese Assistance shall include consumables for 10 months for initial use. For the spare parts that need to be changed after certain period of time (lamp, gasket, fuse, etc), and that can be deteriorated or broken (electrode, suction bottle, etc), 1 set of spare parts shall be included. Procurement of such consumables and spare parts will be from agents in foreign countries as there are few in Eritrea.

Quantity of equipment shall be minimum necessary and reflect the scale of facility, function, and number of staff. Instrument set for hospital, however, shall include the spares considering sterilization cycle.

(7) Policy for Schedule

The schedule of the Project shall be in accordance with the framework of Japanese grant aid scheme, in which a project shall be completed within one fiscal year. Re-wiring construction of electric cable in Agordat hospital shall be completed before arrival of equipment. Staff of Villagio Ginio hospital shall be allocated and users of each equipment shall be assigned before arrival of equipment, so that they may take operation training at handing over of equipment.

2-2-2 Basic Plan

(1) Whole Schedule

Procured equipment are placed or installed in the target hospitals and BEU. Equipment planning shall be based on the actual activities and functions of the facilities, as indicated below.

Table 2-5 Targeted department under the Project

Department	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital
Operation	?	?	?	?
Radiology	?	?	?	?
Laboratory	?	?	?	?
Emergency	?	?	?	?
Physiotherapy	?	?	?	?
Diabetes	?	-	-	-
Obstetrics and Gynecology	-	?	-	?
Ophthalmology	-	?	?	?
ENT	?	-	-	-
Burn injury	?	-	-	-
Orthopedic	?	-	-	-
Dental	?	?	?	?
Others/General	?	?	?	?

Equipment for Agordat hospital shall be planned so that they may not increase electrical burden on the facility, whose existing wirings are not strong enough. The Study team also suggested re-wiring of cable before equipment arrival. The situation in Massawa hospital in which they pump up the water into the elevated water tank and distribute to each department, and in which waste water is discharged into the sea without proper sewage treatment, shall also be taken into consideration of equipment planning.

(2) Examination of Requested Equipment

Based on the policies described above, necessity and relevance of the requested equipment were examined as follows. Appendices 6. shows the results of the examination by equipment.

1) Classification

Table 2-6 Classifications of Requested equipment

Classifications	Contents
Renewal	Equipment to be renewed
New equipment	Equipment which are newly procured
Replenishment	Equipment to be replenished in quantity for the existing equipment.

2) Criterion of Selecting Equipment (BEU)

Table 2-7 Criterion of Selecting Equipment (BEU)

Item of Examination	Contents of Examination	
A. Purpose of use	?	Basic equipment which are essential for maintenance of the equipment and the facilities, and necessary for education to staff.
		Equipment which can be substituted with other equipment, equipment which need to be examined individually.
	×	Equipment which are not compatible with maintenance of the facilities and equipment.
B. Necessity	?	Equipment which are essential for operation of BEU, equipment whose existing ones can not be used for the new equipment procured under the Project.
	×	Equipment which are not necessary for the activities of the facilities, and can be substituted with the existing equipment. Also equipment which are relatively inexpensive and can be procured by the recipient side.
C. Technical Level	?	Equipment which are compatible with the current technical level of the facilities, and which can be used with easy training.
	×	Equipment which require advanced techniques.
D. Management system	?	Equipment for which staff allocation plan is provided
	×	Equipment for which staff allocation plan is not provided
E. Operation and maintenance system	?	Maintenance-free equipment or equipment which require only easy maintenance and can be repaired by staff of the facilities. Also, equipment which the after sale service by manufactures is available and easy to procure spare parts / consumables.
	×	Equipment which are difficult to be maintained by staff, and equipment which the manufactures cannot offer the after sale service, and difficult to procure spare parts / consumables.
F. Maintenance cost	?	Equipment which maintenance cost is negligible, or which do not give budgetary burden to the recipient country.
	×	Equipment which may cause budgetary problem because introduction of new equipment and replenishment require large amount of maintenance cost.
G. Overall decision	?	Equipment judged appropriate and included in the Project.
	×	Equipment judged inappropriate and excluded from the Project.

3) Criterion of selecting equipment (Hospital)

Table 2-8 Criterion of selecting equipment (Hospital)

Item of Examination	Contents of Examination	
Purpose of use	?	Basic equipment which are compatible with the activities of the facilities.
		Equipment which can be substituted with other easier-to-use equipment, and which need to be examined individually.
	×	Equipment which are not compatible with the activities of the facilities, and which are for personal use
Necessity	?	Equipment which are essential for the current activities of the facilities, and equipment with beneficiary effects for patients and hospital staff.
	×	Equipment which are not necessary for the activities of the facilities, which can be substituted with the existing equipment, and equipment with little beneficiary effects. Also, equipment which are relatively inexpensive and can be procured by the recipient side, and equipment which overlap with other request.
Technical Level	?	Equipment which are compatible with the current technical level of the facilities, and which can be used with easy training.
	×	Equipment which require advanced techniques.
Management system	?	Equipment for which staff allocation plan is provided
	×	Equipment for which staff allocation plan is not provided
Operation and maintenance system	?	Equipment which require easy maintenance. Also, equipment which the after sale service by manufactures is available and easy to procure spare parts / consumables.
	×	Equipment which are difficult to be maintained, and equipment which the manufactures cannot offer the after sale service, and difficult to procure spare parts / consumables.

Maintenance cost	?	Equipment which maintenance cost is negligible, or which do not give budgetary burden to the recipient country.
	×	Equipment which may cause budgetary problem because introduction of new equipment and replenishment require large amount of maintenance cost.
Overall decision	?	Equipment judged appropriate and included in the Project.
	×	Equipment judged inappropriate and excluded from the Project.

(3) Examination for Major Equipment

Examinations for major equipment are described by department of each facility as follows.

1) BEU

Training Department

Slidac, used for operation check of electric equipment (ECG, centrifuge, ultrasound, etc) and for temporary voltage adjustment, shall be renewed in the Project as the existing unit is too damaged and dangerous to use. **Blood pressure monitor for calibration**, used for calibration of blood pressure monitor after repair, shall be included. BEU does not have this machine so the accuracy of BP monitor that they repair can not be obtained. **Digital multi meter**, used for continuity test and voltage and current measurements of electronic and electric medical equipment, shall be included as the existing units are so old that its LCD monitor became illegible and have contact failure after mechanical wear. They also share the existing units for both repair and training, which negatively affects their activities. So this equipment shall not be planned only for repairing but also for training. **Electronic components for training**, used to teach circuit theory for new BEU staff, is necessary and shall be included. BEU staff now use tools of various rated specifications that they removed from household radio or video recorder by breaking them.

Inspection and Calibration Department

Multi-parameter X-ray meters is used to measure tube voltage and dosage of X-ray for radiological equipment. **Ventilator calibrator** is used for adjustment of lung ventilator. Those machines are necessary to inspect and calibrate the medical equipment under the Project, although BEU does not have those machines now.

Repair and Training Department

Service engineer's vacuum cleaner is used to clean inside of medical equipment or workshop. **D.C. power supply** is used for temporary power supply for electronic equipment and also for experimental purpose. Both machines are necessary for maintenance of medical equipment under the Project.

Tools and Instruments

Oscilloscope, used for adjustment, testing and repairing of electronic and electric medical equipment, shall be included. Existing oscilloscopes are so old and outmoded that its frequency range can not cover the latest equipment under the Project. Quantity of the existing machine is not also enough. **Antistatic pad** is used to prevent semiconductor from damage due to static electricity.

2) Halibet Hospital

Operation Department

Requested Echocardiogram unit turned out to be an ultrasound apparatus. Thus, this item is out of the scope of the Project since **Ultrasound unit** is planned for Radiology Department under the Project. Requested ECG is new to the hospital and its function overlaps with requested Patient monitor with oxymeter, thus excluded from the Project. Requested Patient monitor with oxymeter shall be renamed as **Patient monitor A**, with parameter of invasive blood pressure, SPO2 and CO2 as well as basic parameters. Requested Patient monitor shall be renamed as **Patient monitor B**, with basic parameters. Requested Blood gas analyzer shall be excluded from the Project due to huge cost of reagents and the running cost. Requested Endoscope, Colonoscope, Rectoscope, Sigmoidoscope, Endoscope video system and Monitor for gastro-intestinal, whose details were not clear, shall be rearranged and renamed as **Endoscope set for upper digestive organs** and **Endoscope set for lower digestive organs**, with basic necessary components.

Requested Anesthesia machine shall replace 3 existing units donated from Italy as used equipment. Requested Operation light, mobile shall also replace the existing unit donated from Italy as used equipment. Requested Cautery unit shall also replace 6 existing units donated from Italy as used equipment, while the one in Burn room which is still in a good condition shall be used. Requested X-ray unit, C-arm shall be excluded since there is one existing machine in a good condition. Requested Autoclave, large type shall be changed to **Autoclave, vertical**, since the large type requires installation work and, once installed, it requires removal, transportation and reinstallation. Vertical type will be more suitable for this hospital with their plan to move to a new site, as operation of the autoclave after those processes could not be assured (refer to the table below for calculation of quantity). Requested Operation table shall replace 2 of the existing units donated from Italy as used equipment that are much older than the others.

Meanwhile, Microscope, ENT, Instrument set for nasal and plastic requested for ENT Department, Electrical dermatomes requested for Burn unit and Operation table requested for Orthopedic Department shall be planned for Operation Department, respectively.

Table 2-9 Calculation of Quantity of Autoclave (Halibet Hospital)

I. Status			
1. Number of Operations	22 cases/day		
2. Surgical Instrument	0.024 M3/case		
3. Linen	0.08 M3/case		
4. Occasional Goods	10% of the amount in one day		
II. Volume of goods which need to be sterilized per day			
1. Operations	22 cases/day	$\times (0.024+0.08)/\text{case}$	= 2.288 M3
2. Occasional Operations	2.288 cases/day	$\times 10\%$	= 0.2288 M3
Total			2.5168 M3
III. Necessary capacity of autoclave			
1. Load Efficiency	60%		
2. Number of Operation	6 times		
3. Capacity of Autoclave	2.5168 M3/day	$\div 60\% \div 6 \text{ times}$	= 0.6991 M3 A
IV. Usage of Existing Autoclave			
1. Volume	0.6 M3		B
2. A-B	0.0991 M3		
Vertical type is planned to be procured since it doesn't need fixed installation even if relocation plan is implemented. Capacity is set about 55 liters.			
IV. Number of Autoclave	0.0991 M3	$\div 0.055 \text{ M3/unit}$	= 1.802 = 2units

Image Diagnostic and Radiology Department

Requested X-ray unit, general shall be changed to **X-ray unit, mobile**, since the requested type requires installation work and, once installed, it requires removal, transportation and reinstallation. Mobile type will be more suitable for this hospital with their plan to move to a new site, as operation of the machine after those processes could not be assured. Requested Ultrasound unit shall be included with abdominal, heart, transrectal and transvaginal probes. The grade shall be based on the existing machine. **Automatic film developer**, though not requested on the list, will be necessary, thus shall be included. Procurement of this item shall be relevant as average number of films developed per day in the year of 2005 exceeds 170, and as the existing unit is too old to support their activity. **X-ray protective set**, including protective screen, apron, gloves, etc., though not requested on the list, shall also be added to reinforce protection from radiological leak.

Laboratory

The requested Japanese assistance shall support the improvement plan of Laboratory Department which is now under way of development. Requested Centrifuge shall be procured for Haematology, Serology and Bacteriology rooms, respectively. Requested Drying oven shall be procured for Bacteriology and Parasitology rooms, respectively. 1 unit of Medical refrigerator and Microscope, binocular shall be procured for Urinarisis, Bacteriology and Parasitology rooms, respectively. Requested ELISA machine, while it turned out to be Biochemical analyzer, shall be excluded due to huge cost of reagents and running cost. Requested Blood cell counter shall also excluded since they already possess the ones.

ENT

Requested Microscope, ENT, while it turned out to be an operation microscope, shall be excluded since they already possess the one. Requested Telescope set shall be included as a rigid type in the Operation Department, which can be justified in terms of technical level and necessity. Requested Instrument set for nasal and plastic shall be included in the Operation Department. Requested Retinoscope turned out to be an error in preparing the request list and it shall be **Suction pump, small**, as requested from the department head.

Burn

Old Dermatome shall be renewed and supplied in the Operation Department. Requested Patient monitor shall be excluded as one unit is already equipped. Requested Perfuser, while it turned out to be a cuff to put pressure to blood bag for transfusion, shall be excluded since this kind of simple tool item should be procured by Eritrean side. Requested Blood gas and electrolyte analyzer shall be excluded due to huge cost of reagent and the running cost.

Orthopedic Department

Requested Operation table and Gypsum cutter, which are very old and can not function well, shall be included. Operation table shall be supplied in the Operation Department.

Dental Department

Requested Dental unit shall be excluded since it requires installation work and, once installed, it requires removal, transportation and reinstallation. Operation of the dental unit after those processes could not be assured. Requested Instrument set for dental shall also be excluded as they already possess enough quantity.

Miscellaneous

Requested Solar panel aimed at power supply to medical refrigerator, but this request shall be excluded since the hospital is supplied with electrical power for 24 hours and amount of power that would be reduced by introducing Solar panel is marginal. Requested Generator shall also be excluded since it requires installation work and, once installed, it requires removal, transportation and reinstallation. Operation of the generator after those processes could not be assured.

Diabetes Unit

Requested Slit lamp shall be excluded due to absence of ophthalmologist in the department. Director of hospital requested the Study team to select appropriate items for requested Physiotherapy equipment set to assist treatment of diabetes patients in the earlier stage. This request is relevant and **Exercise bike, Traction pulley and Exercise mat** shall be added. Push up blocks, Medicine ball set, Walk exercise block and Parallel bars shall be excluded since they already possess the one.

3) Agordat Hospital

Operation Department

Almost all of the equipment in the 2 operation rooms are very old. Requested Operation table, manual type, shall replace 2 existing units in the both rooms. Requested Operation light, mobile and Operation stool shall also replace the existing ones. Requested ECG shall be excluded since its function is included in Patient monitor which will be added to the list of this department from the request of Emergency Department, and since ECG is new to this hospital. Requested Anesthesia machine shall replace the one in the Minor Operation room, which is much older. Requested Oxygen regulator set, Flowmeter oxygen and Nebulizer shall be integrated as **Oxygen regulator set**. Requested Cautery unit shall replace the one in the Minor Operation room, which is much older.

Meanwhile, Patient Monitor and Infusion pump requested from Emergency Department shall be included in the equipment list of the Operation Department as those equipment are much more needed in the Operation Department. Operation microscope requested from the Ophthalmic Department shall be included in the list of the Operation Department as the Ophthalmic Department does not have its operation room.

Emergency Department

Almost all of the equipment are seriously old. Requested Sphygmomanometer and Stethoscope will be necessary and thus shall be included in the Project. Requested Emergency cart, Plaster bandage table and Gypsum cutter, electric will be necessary for emergency health services and thus shall be included in the Project. Requested Patient monitor, ECG, 3 channel, Defibrillator with ECG monitor, which are all new to the hospital, shall be included in the Project as technical level of the users are sufficient. Requested Instrument cabinet, Instrument trolley and Oxygen concentrator shall be excluded since they already possess the ones. Requested Cautery unit shall also be excluded since there is no operation room in the Emergency Department. Requested Patient monitor and Infusion pump shall be included in the list of Operation Department.

Imaging Diagnosis Department

Equipment in this department are seriously old. Requested X-ray unit, C-arm shall be included to support surgical image diagnosis. Though not requested in the list, **X-ray protective set** including screen, gloves, apron, etc. shall be added to reinforce protection against radiological leak.

Laboratory Department

Condition of equipment is relatively good in this department. Requested Centrifuge and Drying oven shall be included for 1 of the 2 rooms. Requested Haematology analyzer shall be excluded since they already have this unit. Requested Microscope, binocular shall be included and replace 1 of the 2 existing units which is much older. Requested Shaker shall be excluded since they already have the one in a good condition.

Physiotherapy Department

Requested Shortwave therapy unit, Ultrasound therapy unit and Infrared lamp, though they are new to this hospital, shall be included since technical level of the users is sufficient. Requested Traction table, Overhead frame and Duplex pulley weight system for wall mounting, Clamp for fitting fixation straps, Chest belt, Hip belt, Neck harness and Weight set shall be integrated into one item and shall be renamed as **Traction pulley** to be included under the Project. Director verbally requested physiotherapy equipment to treat diabetes patient that are increasing these days. In response to this request, **Exercise bike, Walk exercise blocks** and **Exercise balls** set shall be added.

Gynecology and Obstetric Department

Almost all of the equipment are old. Requested Delivery table and Operation light, mobile shall be renewed. Requested Ultrasound unit, B/W, though it is new to this hospital, shall be relevant in terms of necessity and technical level, thus included in the Project. Requested Anesthesia machine and Operation table shall be excluded since there is no operation room for this department. Requested Infant warmer, though it is new to this hospital, shall be necessary and relevant, thus included in the Project.

Dental Department

All of the equipment are seriously old. 2 Dental units are requested but 1 unit shall be included due to the space of the room. Technical level of the users for requested X-ray unit, dental is sufficient, thus shall be included in the Project. Though not listed, **Film developer, dental** will be necessary and thus shall be added to the Project.

Ophthalmic Department

Requested Slit lamp, Retinoscope, Reflectometer, Examination chair, eye will be necessary for basic diagnosis and thus shall be included in the Project. Requested Operation microscope will be necessary for treatment and thus shall be included in the list of Operation Department. Requested Tonometer shall be integrated into Slit lamp and renamed as **Slit lamp with tonometer** to be included in the Project.

Miscellaneous

Requested Laundry machine shall be excluded since there is one existing in the hospital. Requested Solar panel aimed at power supply to medical refrigerator, but this request shall be excluded since the hospital is supplied with electrical power for 24 hours and amount of power that would be reduced by introducing Solar panel is marginal.

4) Massawa Hospital

Operation Department

Requested Operation table, Operation light, mobile and Cautery unit shall replace the existing ones in 2 rooms that are seriously old. Requested ECG, Defibrillator, Pulse oxymeter, though they are

new to this hospital, will be necessary and relevant in terms of necessity and technical level, thus shall be included in the Project. Requested ECG shall be excluded since they have never used before. Requested Vacuum extractor will be useful for caesarian section or high risk delivery, thus shall be included. Autoclave, dental and Infant incubator requested from Miscellaneous Supplies shall be added to the list of this department and included as **Autoclave, vertical** and **Infant incubator**, respectively. Requested Oxygen concentrator shall be excluded since there is an existing one in a good condition.

Table 2-10 Calculation of Quantity of Autoclave (Massawa Hospital)

I. Status			
1. Number of Operations	2 cases/day		
2. Surgical Instrument	0.024 M3/case		
3. Linen	0.08 M3/case		
4. Occasional Goods	10% of the amount of one day		
II. Volume of goods which need to be sterilized per day			
1. Operations	2 case/day	$\times (0.024+0.08)/case$	= 0.208 M3
2. Occasional Operations	0.208	$\times 10%$	= 0.0208 M3
Total			0.2288 M3
III. Necessary capacity of autoclave			
1. Load Efficiency	60%		
2. Number of Operation	6 times		
3. Capacity of Autoclave	0.2288 M3/day	$\div 60\% \div 6times$	= 0.0636 M3
Vertical type is planned to be procured since it doesn't need fixed installation even if relocation plan is implemented. Capacity is set about 55 liters.			
IV. Number of Autoclave	0.0636 M3	$\div 0.055 M3/unit$	= 1.1556 = 2units

Emergency Department

Almost all of the equipment are old. Requested Examination table, Instrument cabinet, Emergency cart and Instrument trolley are basic equipment for emergency services, and thus shall be included. Requested Wheel chair and Stretcher will be necessary for transportation of patient, and thus shall be included. Requested Ophthalmoscope, battery, Pulse oxymeter, Lung function tester, ECG, are necessary for emergency diagnosis, and thus shall be included. Requested Ambubag set, Infusion pump, Instrument set for gypsum, Plaster bandage table are necessary for emergency treatment, and thus shall be included. Requested Patient monitor, though it is new to this hospital, shall be added into the list of Operation Department since it is much more needed in the Operation Department. Requested Cautery unit and Oxygen concentrator shall be excluded since there are already existing ones in a good condition.

Imaging Diagnosis Department

Requested X-ray unit, general shall be changed to **X-ray unit, mobile**, since the requested type requires installation work and, once installed, it requires removal, transportation and reinstallation.

Mobile type will be more suitable for this hospital with their plan to move to a new site, as operation of the machine after those processes could not be assured. Requested Automatic developer shall be excluded and replaced with **X-ray processing tank**. Number of films developed per day is 13 to 14 in 2006, thus advantage of introducing an automatic type would be marginal. Requested Ultrasound unit, B/W and Doppler Ultrasound Fetal heart beat detector will be necessary for caesarian section and high risk delivery, thus shall be included. Requested Sigmoidoscope shall be excluded since they have never used before. Though not requested in the list, **X-ray protective set** including screen, gloves, apron, etc. shall be added to reinforce protection against radiological leak.

Laboratory Department

This department is relatively well equipped. Requested Centrifuge shall be supplied for OPD Laboratory and Shaker for Main Laboratory. Requested Microscope, binocular and Drying oven shall be excluded since there are already the existing ones in good condition. Requested Haematology analyzer shall be excluded due to huge cost for reagents and running cost. Refrigerator requested from Miscellaneous shall be renamed as Drug refrigerator to be included in the Main Laboratory.

Ophthalmic Department

Requested Retinoscope, Reflectometer, Ophthalmoscope are necessary for ophthalmic diagnosis, thus shall be included. Requested Operation microscope shall be excluded since there is an existing one in a good condition. Requested Examination chair, ophthalmology shall be included with basic specifications. Requested Slit lamp shall be excluded since there are existing units in a good condition. Requested Keratometer and Lensmeter shall be excluded due to lack of experience in the users and lack of urgency.

Dental Department

Requested Dental unit shall be excluded since it requires installation work and, once installed, it requires removal, transportation and reinstallation. Operation of the dental unit after those processes could not be assured. Requested X-ray unit, dental, though it is new to the hospital, is considered relevant in terms of necessity and technical level, thus shall be included. This unit shall include x-ray protective aprons. Though not listed, **Film developer, dental** will be necessary and shall be added to the list.

Miscellaneous

Requested Generator, 150KVA shall be excluded since it requires installation work and, once installed, it requires removal, transportation and reinstallation. Operation of the generator after those processes could not be assured. Requested Solar panel aimed at power supply to medical refrigerator, but this request shall be excluded since the hospital is supplied with electrical power for 24 hours and amount of power that would be reduced by introducing Solar panel is marginal.

5) Villagio Ginio Hospital

General

Opened in May, 2005, this hospital is not equipped with major medical equipment. The MOH already prepared the staff allocation list. The requested Japanese assistance shall help the improvement plan for this hospital.

Requested Screen and Mayo table shall be distributed in Delivery room, Emergency room and OPD, each 1 unit respectively. Requested Drying oven shall be supplied in Delivery room and OPD, each 1 unit respectively. Requested Examination light, mobile shall be distributed in Delivery room, Emergency room and OPD, each 1 respectively. Requested Examination table, obstetric shall be supplied Delivery room (1 unit) and OPD (2 units).

Operation Department

For requested Operation table, Examination light, mobile, Operation stool, Anesthesia machine and Laryngoscope set, Makintosh, the quantity shall be two units since 2 doctors will be allocated in this department. 2 units shall also be included for the requested Oxygen regulator set, Flowmeter oxygen and Nebulizer, all of which shall be integrated into 1 unit and renamed as **Oxygen regulator set**. 2 units shall also be supplied for the requested in Suction unit and Cautery unit.

Delivery Department

Requested Delivery table, Instrument set for delivery shall be supplied in Delivery room and OPD, each 1 respectively. Doppler Ultrasound Fetal heart beat detector shall be included in Delivery room. Ultrasound unit, B/W shall be with basic specifications. Requested Autoclave shall be a large type to cover the need of the whole hospital. Incubator and Infant warmer shall be included in Delivery room, 2 each respectively.

Imaging Diagnosis Department

Requested X-ray unit, mobile, X-ray film viewer, X-ray film cassette set and X-ray processing tank shall be included in the Project. Though not requested in the list, **X-ray protective set** including screen, gloves, apron, etc. shall be added to reinforce protection against radiological leak.

Dental Department

2 Dental units are requested but, due to the room capacity, 1 unit shall be included, together with the requested X-ray unit, dental and Autoclave, small. X-ray unit, dental shall be accompanied with protective aprons. Though not listed, **Film developer, dental** will be necessary and shall be added to the list.

Ophthalmic Department

Requested Slit lamp, Retinoscope, Refractometer, Lens set, Ophthalmoscope, Examination chair, ophthalmology will be necessary for basic diagnosis, thus shall be included in the Project.

Requested Tonometer shall be integrated into Slit lamp and renamed as **Slit lamp with tonometer** to be included in the Project.

Emergency Department

2 sets of Instrument set for caesarian section, D&C set shall be included, considering sterilization cycle. Requested Resuscitator, for neonate with mask and Resuscitator for adult shall be integrated into 1 unit and renamed as **Ambu bag set** to be included in the Project. Requested Emergency unit set turned out to be an Emergency cart, which will be necessary, thus shall be included.

Physiotherapy Department

Requested Shortwave therapy unit, Ultrasound therapy unit, Infrared lamp, etc. will be necessary for basic physiotherapy treatment, thus shall be included in the Project. Requested Traction table, Overhead frame and Duplex pulley weight system for wall mounting, Clamp for fitting fixation straps, Chest belt, Hip belt, Neck harness and Weight set shall be integrated into one item and shall be renamed as **Traction pulley** to be included under the Project. Director verbally requested physiotherapy equipment to treat diabetes patient that are increasing these days. In response to this request, **Exercise bike, Walk exercise blocks** and **Exercise balls** set shall be added.

Laboratory Department

Requested Refrigerator shall be renamed as **Drug refrigerator** to be included. Haematology analyzer and Automatic chemistry analyzer shall be excluded due to huge cost of reagents and maintenance. 1 Blood cell counter and Centrifuge shall be supplied per 3 engineers, 1 Microscope, binocular shall be supplied per 2 engineers, respectively.

Miscellaneous

Requested Linen cart shall be procured by Eritrean side. Laundry machine shall be excluded since there is one existing unit in a good condition. Requested Solar panel aimed at power supply to medical refrigerator, but this request shall be excluded since the hospital is supplied with electrical power for 24 hours and amount of power that would be reduced by introducing Solar panel is marginal. Generator, 150KVA will be necessary for backup in case of blackout, thus shall be included.

6) Additional Item for Four Hospitals

Though not requested at the Preliminary Study stage, the following instrument set will be necessary for basic operation, thus shall be included in the Project. If they are already requested, the original request shall be prioritized.

- Instruments, theater cesarean section, extras
- Instruments, theater gynecology, extras
- Instruments, theater tracheotomy, extras

- Instruments, theater basic major
- Instruments, theater basic minor

(4) Equipment Planning

Examined as above, the Equipment List (Appendices 7), the Outline of Major Equipment (Appendices 8), and the Equipment Delivery List (Appendices 9) shall be attached. List of spare parts and consumables for major equipment is shown below.

Table 2-11 Spare Parts / Consumables for Major Equipment

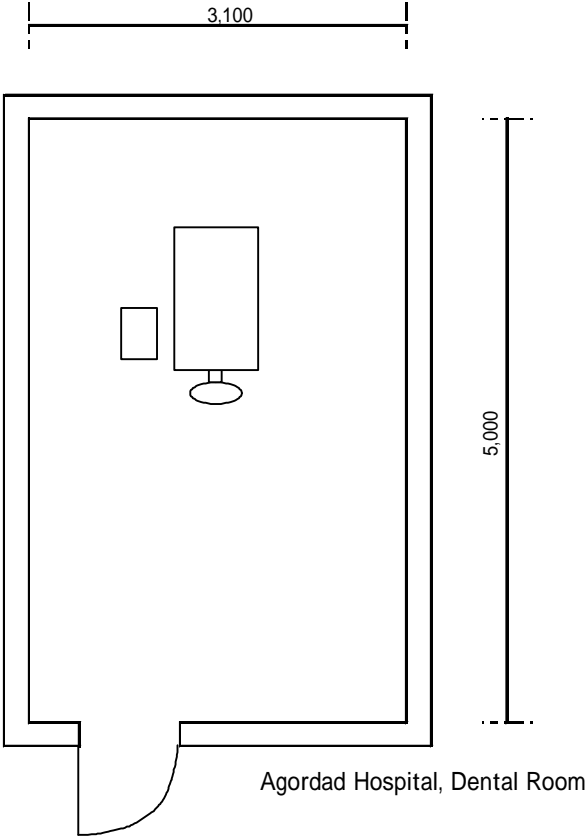
Description	Spare Parts	Q'ty	Unit
Anesthesia machine, A	Closed patient circuit set, adult reusable	1	set
	Closed patient circuit set, pediatric reusable	1	set
	Anesthesia mask and joint parts set for adult (L, M, S, each 1 piece/set)	1	set
	Anesthesia mask and joint parts set for pediatric (2 sizes/set)	1	set
Cautery unit	Electrode set (10kinds/set or more)	1	set
Dental scaler	Tip (2 kinds/set)	1	set
ECG	Chest electrode, reusable for adult (6 pieces/set)	1	set
	Limb electrode, reusable for adult (4 pieces/set)	1	set
Endoscope set for lower digestive organs	Xenon bulb	1	piece
Endoscope set for upper digestive organs	Xenon bulb	1	piece
Infrared lamp	Light bulb	1	piece
Muscle stimulator	Electrode (3 sizes, 10pieces/each)	1	set
	Electrode cable	2	piece
Operation light, mobile	Halogen bulb	1	set
	Control handle	1	piece
Operation microscope, ophthalmic	Halogen bulb	1	piece
Operation table	Mattress	1	set
Operation table, orthopedic	Mattress	1	set
Pulse oximeter	Finger probe for adult (re-usable)	1	piece
	Probe for neonate (re-usable)	1	piece
Retinoscope	Lamp	4	piece
Suction pump	Suction bottle with cap	2	piece
Vacuum extractor	Suction bottle	2	piece
X-ray film viewer	Fluorescent lamp	1	set
Function Generator	Signal Cable (BNC-Alligator clip)	1	piece
	Signal Cable (BNC-IC clip)	1	piece
pH meter	Electrode	1	piece
Description	Consumables	Q'ty	Unit
Amalgam mixer	Mixing capsule (10 pieces/pack)	22	pack
Anesthesia machine, A	CO2 absorber tablets (4.5 kg/set)	2	set
Autoclave, large	Recording paper	5	piece
	Pre-filter element	3	set
Automatic developer	Developer solution (19 L/bottle)	16	piece
	Fixer solution (19 L/bottle)	16	piece
Defibrillator	Gel (1,000g)	1	set
	ECG electrode (150 pieces/set)	1	set
	Printer paper	10	piece
ECG	ECG cream (1,000g)	1	set

	Recording paper	10	piece
Electrical dermatomes	Dermatome blade (10 pieces/set)	1	set
	Skin carrier, 2 sizes (10 pieces/set)	1	set
Film developer, dental	Developing solution (30L/set)	1	set
	Fixing solution (30L/set)	1	set
Generator, 150KVA	Oil filter	8	piece
	Fuel filter	8	piece
	Air cleaner element	1	piece
Infant warmer	Adhesive collar (100sheets/box)	1	box
Microscope, binocular	Immersion oil, 50cc	5	piece
Patient monitor, A	ECG electrode (150 pieces/set)	1	set
	Adapter for etCO2, disposable (20 pieces/set)	1	set
	IBP transducer, disposable (5 pieces/set)	1	set
	Recording paper (10 pieces/set)	1	set
Patient monitor, B	ECG electrode (150 pieces/set)	1	set
	Recording paper (10 pieces/set)	1	set
Ultrasound unit, color doppler	Gel (250ml)	12	piece
	Color printer paper (200sheets/ box)	1	box
Printer	Toner cartridge	1	piece

2-2-3 Basic Design Drawings

Equipment installation drawings are shown as below.

- (1) Agordad Hospital
- Item No. : A-020
- Delivery No. : AGO-DT-04
- Description : Dental unit

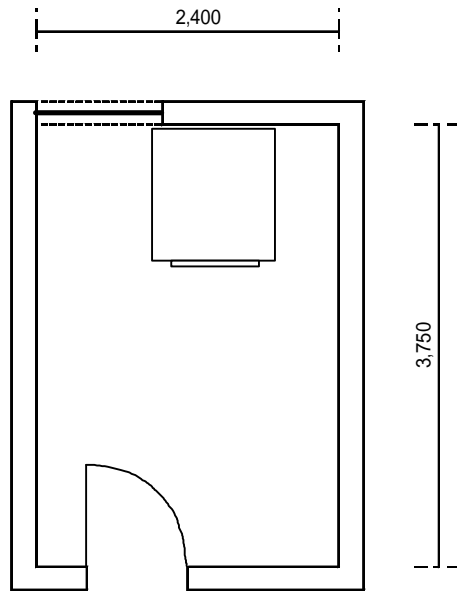


(2) Villagio Ginio Hospital

Item No. : A-006

Delivery No. : VIL-OG-06

Description : Autoclave, large



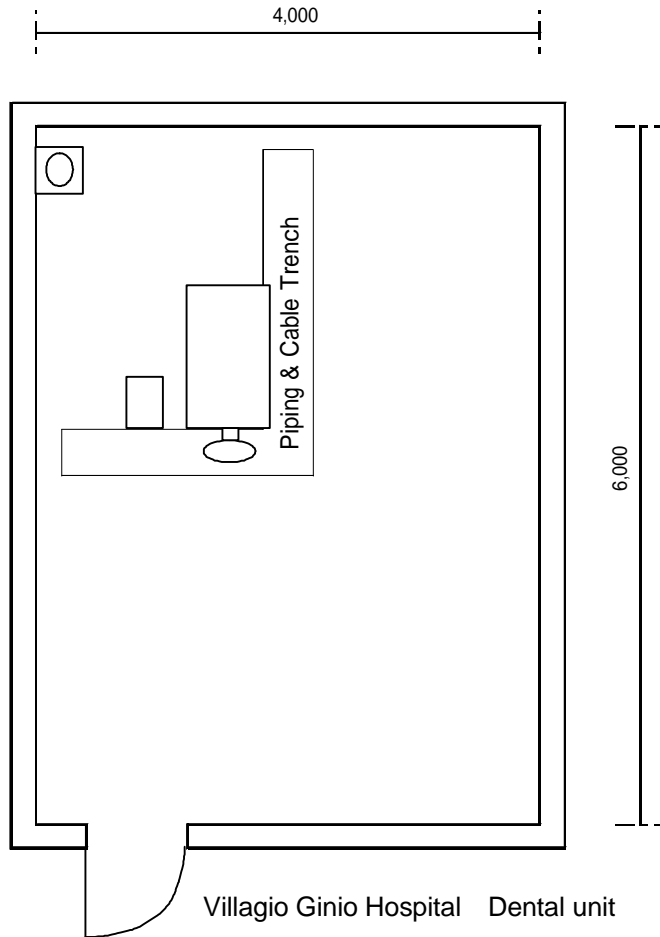
Vilagio Ginio Hospital, Sterilization Room

(3) Villagio Ginio Hospital

Item No. : A-020

Delivery No. : VIL-DT-04

Description : Dental unit



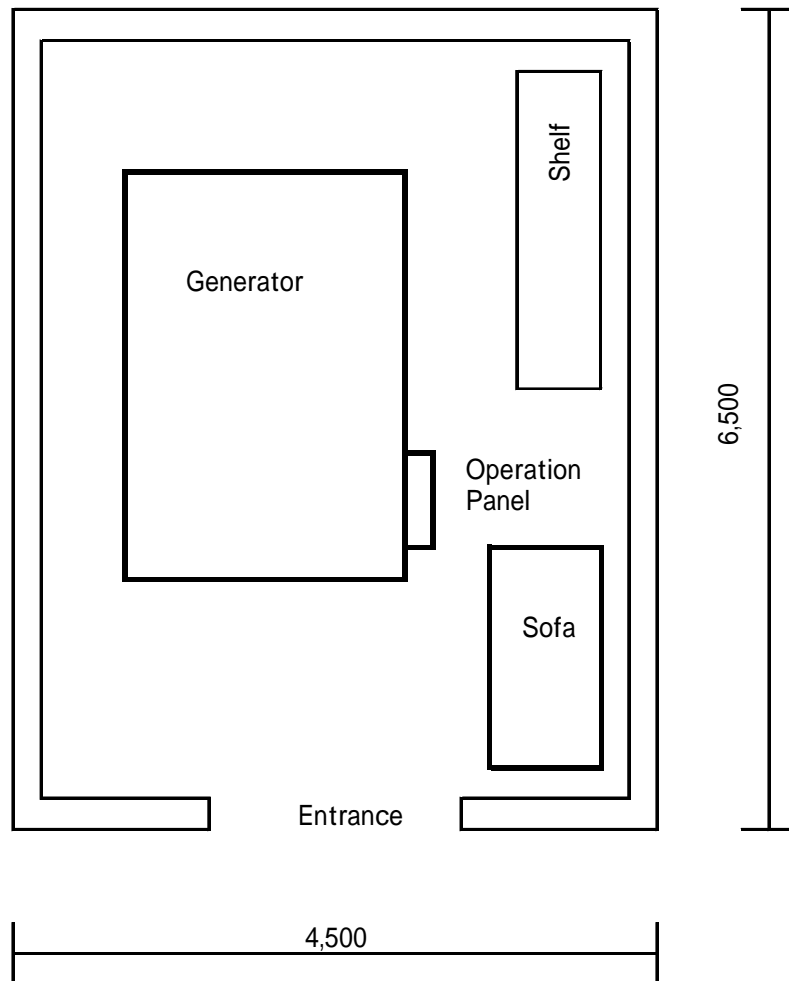
(4) Villagio Ginio Hospital

Item No. : A-040

Delivery No. : VIL-MS-01

Description : Generator, 150KVA

□ Power pole



2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The Requested Japanese Assistance shall be executed in accordance with the framework of Japan's grant aid scheme. After conclusion of the exchange of notes (E/N) regarding the Project between the two governments, the Project will officially be commenced.

This procedure will be followed by conclusion of a consultant agreement, implementation of detailed design (preparation of tender documents). Tendering of equipment supply contractor (hereinafter referred to as "the Supplier") will be held thereafter. The Supplier selected through the tenders shall then execute equipment supply and installation work.

During the detail design stage the Consultant and the persons concerned in Eritrea will study installation schedule of the Project and have discussions to ensure smooth implementation of works undertaken by the both Governments.

(1) Implementing Organization

This Project will be supervised by the MOH, and the implementing agency of this Project is International Cooperation Office which is under the control of Minister's Office. Department of Regulatory Service exercises jurisdiction over BEU, and Department of Health Service exercises jurisdiction over the healthcare provider, such as Zonal hospitals and Sub-Zonal hospitals, through Zonal Management Office.

(2) Consultant

Immediately after the conclusion of E/N between the two governments, the Government of Eritrea will conclude a consultant agreement with a selected Japanese consultant in accordance with the Grant Aid scheme of the Government of Japan. The consultant will carry out the following services in compliance with the provisions of the consultant agreement.

- Detail Design: Preparation of the detail design documents including specifications and other technical documents
- Assistance of Tendering: Assistance of tendering to select the Supplier, and concluding the contract
- Supervision: Supervision of equipment procurement including installation and instruction for operation and maintenance provided by the Supplier

In Detail Design stage, the Consultant will prepare tender documents including detailed specifications and equipment plan based on the Basic Design and tender instructions and condition of the contract.

In Tendering stage, the Consultant will provide the tendering services, e.g. public notice of tender, receipt of applications, distribution of tender documents, tender opening, evaluation of the tender

results. Furthermore, the Consultant will assist on concluding the contract between the Government of Eritrea and the Supplier, and report to the Government of Japan.

In Supervision stage, the Consultant will ensure that equipment procurement will be carried out fairly in accordance with the contract documents as well as instructions, advice and coordination, for implementation of the Project. The supervision service includes the following;

a. Coordination, instructions and advice to the Supplier

The Consultant will examine the equipment procurement / installation plan, and shall coordinate, give instructions and advices to the Supplier.

b. Examination and approval of installation drawings

The Consultant will examine, instruct and approve the installation drawings and other relevant documents submitted by the Supplier.

c. Confirmation and approval of equipment

The Consultant will confirm and approve the equipment proposed by the Supplier in compliance with the contract documents.

d. Factory inspection

The Consultant shall inspect, if necessary, the equipment at the manufacturers' factories to ensure the quality and performance.

e. Reporting progress of work

The Consultant shall grasp the actual conditions of the installation work and progress, and report them to both the governments of Eritrea and Japan.

f. Completion inspection and commissioning test

Upon completion of the equipment work, the consultant will conduct a final inspection and commissioning tests of the installed equipment to ensure that all the works are completed in compliance with the contract documents, and will submit the completion certificates to the Government of Eritrea.

g. Training for operation of the equipment

Some equipment included in the Project will require expertise on operation and maintenance. Therefore, the persons in charge of operation of the equipment will be required to receive on-site training by the Supplier during the installation / adjustment / test-run period. The Consultant shall give instructions and advice regarding the training programme.

(3) The Supplier

The Supplier selected through the tenders will conclude a contract with the Government of Eritrea.

The Supplier will procure, supply and install medical equipment in accordance with the contract documents and give instruction for operation and maintenance of the equipment. Moreover, the Supplier will establish the system which provides spare parts / consumables as well as maintenance instruction even after handing over of the equipment.

2-2-4-2 Implementation Conditions

(1) Equipment Procurement

1) Supervision of Equipment Installation

Installation work and training of the procured equipment for the 4 target hospitals will be done during the operation period of the existing facilities. Therefore, schedule of installation work and training must be controlled through close communication between Eritrean side and the consultant not to hinder the activities of the facilities.

2) Dispatch of Engineer

Engineers shall be dispatched from the manufacturers or distributors of equipment under the Requested Japanese Assistance. They shall give instruction to staff of the facilities as to handling, operation, daily maintenance, etc. so that the equipment may be used properly and effectively.

2-2-4-3 Scope of Works

(1) Work under Japan's Grant Aid

- Procurement, transportation, loading and unloading of the equipment to the Project site
- Installation and test operation of the equipment
- Explanation, operation and maintenance training for the equipment

(2) Work under the Government of Eritrea

- Relocation, removal of the existing equipment and prepare the place where the procured equipment will be installed (including the completion of operation ward and X-ray ward in the Villagio Ginio Hospital)
- Provision of temporary storage for the procured equipment within the Project site
- Provision of access way for transportation of the procured equipment
- Provision of water supply (with bulbs), drainage (with end caps), power supply (with receptacles, breakers), medical gas supply, reinforcement of foundations, and so on, which is necessary prior to equipment installation

2-2-4-4 Consultant Supervision

(1) Supervision Policy on Procurement

In accordance with the scheme of Japan's Grand Aid, the consultant will organize the Project working team to ensure smooth implementation of the Project based on the policy of the basic design. The supervision policies on procurement are as following;

- To keep close communication with the persons in charge of the Project of both the Governments to ensure completion of procurement of equipment without delay
- To promptly give proper advices and instructions with justice to the Supplier
- To give proper advices and instructions concerning installation and operation of equipment after handover
- To confirm completion of equipment installation in compliance with conditions of the contract, to attend handover of equipment, and to conclude the consulting services with approval of Eritrean side

(2) Supervision Plan on Procurement

Judging from the scale of the Project, it is advisable that, in carrying out the aforementioned tasks, the consultant shall implement spot supervision by Project Manager and Equipment Planner. The Consultant shall also dispatch necessary consultants / engineers to the site at relevant occasions for inspection, instruction and coordination, and at the same time, assign necessary engineers in Japan to establish a communication and support system. The consultant shall report the progress of the works, payment procedures, completion of construction of the facilities and installation of the equipment, and any other relevant matters to the concerned officers of the Government of Japan.

2-2-4-5 Procurement Plan

(1) Procurement of Equipment

Equipment procured shall be the product of either Japan or Eritrea. However, the third country products shall be selected after approval of the both governments. They must meet the following conditions.

- The manufacturer has (a) local distributor(s) for maintenance in Eritrea
- Equipment which incidence rate of breakdown is low and maintenance cost is inexpensive
- There is no product of Japan or Eritrea, or equivalent specifications
- Equipment which maintenance check is easy and manufacturer provides after-sale service
- Equipment which are widely used in Eritrea
- Equipment which are procured within the E/N period

Equipment which contain the possibility of third country origin are as following.

Table 2-12 Equipment which have the possibility of third country origin

Item No.	Equipment	Country of Origin
A-001	Amalgam mixer	USA, EU
A-002	Ambu bag set	USA, EU
A-003	Anesthesia machine, A	USA, EU
A-004	Anesthesia machine, B	USA, EU
A-006	Autoclave, large	USA, EU
A-007	Autoclave, small	USA, EU
A-008	Autoclave, vertical	USA, EU
A-009	Automatic film developer	USA, EU
A-012	Cautery unit	USA, EU
A-013	Centrifuge	USA, EU
A-016	Defibrillator	USA, EU
A-017	Delivery bed	USA, EU
A-018	Instrument set for dental	USA, EU
A-019	Dental scaler	USA, EU
A-020	Dental unit	USA, EU
A-021	Distiller	USA, EU
A-022	Doppler machine	USA, EU
A-023	Doppler Ultrasound Fetal heart beat detector	USA, EU
A-024	Drill, electrical	USA, EU
A-025	Drug refrigerator	USA, EU
A-026	Drying oven	USA, EU
A-027	ECG	USA, EU, Asia
A-028	Electrical dermatome	USA, EU
A-030	Endoscope set for lower digestive organs	USA, EU
A-031	Endoscope set for upper digestive organs	USA, EU
A-032	Endoscope set, ENT	USA, EU
A-033	Examination chair, ophthalmology	USA, EU
A-034	Examination light, mobile	USA, EU
A-035	Examination table	USA, EU
A-036	Examination table, OB/GY	USA, EU
A-037	Exercise bike	USA, EU
A-038	Exercise mat	USA, EU
A-039	Film developer, dental	USA, EU
A-040	Generator, 150KVA	USA, EU, Asia
A-041	Gypsum cutter, electrical	USA, EU
A-043	Infant incubator	USA, EU
A-044	Infant warmer	USA, EU
A-045	Infrared lamp	USA, EU
A-046	Infusion pump	USA, EU
A-062	Laryngoscope set, Mackintosh	USA, EU
A-064	Lung function tester	USA, EU
A-066	Medicine ball set	USA, EU
A-067	Microscope, binocular	USA, EU
A-068	Muscle stimulator	USA, EU
A-069	Operation light, mobile	USA, EU
A-070	Operation microscope, ophthalmic	USA, EU
A-072	Operation table	USA, EU

Item No.	Equipment	Country of Origin
A-073	Operation table, orthopedic	USA, EU
A-074	Fiber head light with light source	USA, EU
A-075	Ophthalmic loupe	USA, EU
A-076	Ophthalmoscope, battery	USA, EU
A-077	Ophthalmoscope, electrical	USA, EU
A-078	Ophthalmoscope, indirect	USA, EU
A-079	Oxygen regulator set	USA, EU
A-080	Parallel bars	USA, EU
A-081	Patient monitor, A	USA, EU
A-082	Patient monitor, B	USA, EU
A-083	Peak flow meter	USA, EU
A-084	Pen light	USA, EU
A-085	Physiotherapy unit, mobile	USA, EU
A-087	Push up block set	USA, EU
A-088	Pulse oxymeter	USA, EU
A-089	Refractometer	USA, EU, Asia
A-090	Retinoscope	USA, EU
A-092	Shaker	USA, EU
A-093	Microwave therapy unit	USA, EU
A-094	Slit lamp with tonometer	USA, EU, Asia
A-095	Snellen's chart, E-type	USA, EU
A-097	Stethoscope	USA, EU
A-099	Suction pump	USA, EU
A-100	Suction pump, small	USA, EU
A-103	Traction pulley	USA, EU
A-104	Trial lens, adult	USA, EU
A-105	Trial lens, child	USA, EU
A-106	Ultrasound therapy unit	USA, EU
A-107	Ultrasound unit, color doppler	USA, EU, Asia
A-108	Ultrasound unit, B/W	USA, EU, Asia
A-109	Vacuum extractor	USA, EU
A-110	Walk exercise step	USA, EU
A-113	X-ray film viewer	USA, EU
A-114	X-ray processing tank	USA, EU
A-115	X-ray unit, C-arm	USA, EU
A-116	X-ray unit, dental	USA, EU
A-117	X-ray unit, mobile	USA, EU
B-007	Computer with UPS	USA, EU, Asia
B-008	Printer	USA, EU, Asia
B-018	X-ray meters, Multi-parameter	USA, EU
B-019	Ventilator calibrator	USA, EU, Swiss
B-020	Safety analyzer	USA
B-021	ECG simulator	USA
B-022	Microprocessor Kit	USA
B-023	Defibrillator energy testing analyzer	USA
B-027	IC remover	Asia
B-030	Electronic service tool	USA, EU
B-036	Stethoscope for machine inspection	USA, EU

Item No.	Equipment	Country of Origin
B-037	Micro tech tool set	Asia
B-043	Altimeter	Asia
B-044	Scientific calculator	Asia
B-050	Oscilloscope 100Mhz	USA, EU
B-053	Digital clamp meter	Asia

(2) Transportation Plan

1) Japan and Third Country Products

• Ocean Transportation

Dump-proof packed in containers, products from Japan and third countries shall be shipped and discharged at Massawa port. Crossing 2 stopovers, it takes as long as 1.5 months for transportation.

• Inland transportation

After custom clearance, the equipment, together with the locally procured equipment, shall be sorted out according to its destination at a designated warehouse in Massawa. Then, the equipment shall be transported to each site by truck.

2) Locally Procure Products

There are local agents of medical equipment manufacturer in Asmara, but most of the products are imported from overseas. Thus, locally procured products shall also be transported from Massawa port to each site.

2-2-4-6 Quality Control Plan

Equipment to be procured under the Project shall be ready-made medical equipment, and shall be selected from the equipment which have been already used in hospital. Also, procured equipment shall be selected from the equipment which complies with internationally recognized standards, such as JIS, BS, UL or DIN and other standard. Moreover, equipment which require consumables or reagents shall be selected from the equipment which consumables / reagents are available in Eritrea or from vicinity countries.

2-2-4-7 Operation Guidance Plan

Following training for hospital and BEU shall be implemented by the Supplier so that procured equipment may be used effectively and for a long period of time. All necessary documents, operation and maintenance manuals and manufacturer / agent list shall be submitted.

- Operation training (Outline of equipment, procedures, items to confirm, etc.)
- Periodical maintenance (Cleaning, adjustment, minor repair, etc.)

2-2-4-8 Soft Component (Technical Assistance) Plan

BEU is solely responsible for maintenance of medical equipment in Eritrea. However, with their limited human and material resources, it is becoming difficult for them to handle maintenance work for all of the

public health facilities in Eritrea, including the 4 target hospitals under the Project.

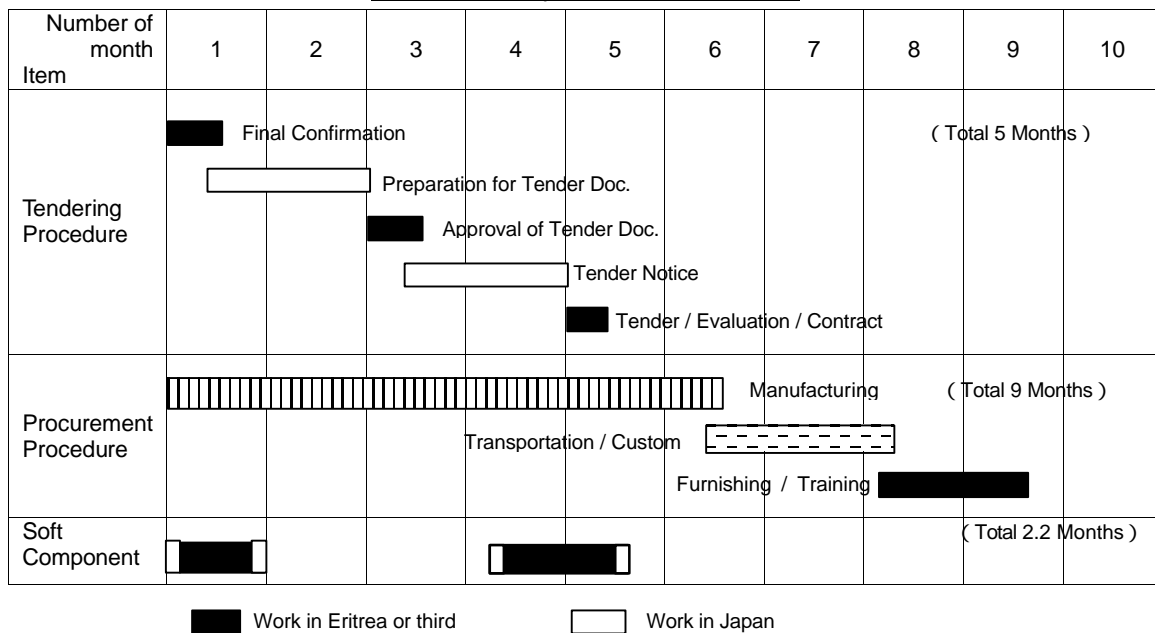
Great deal of the medical equipment used in health facilities are donated from oversea organization or foreign countries, most of which are secondhand equipment. This has increased among the local users little sense of preventive maintenance, importance of equipment register book, or other format necessary for maintenance work. So, implementation of Soft Component (Technical Assistance), to suit arrival of medical equipment under the Project, is requested so that a sense of preventive maintenance may be well understood and that procured equipment may be used effectively and for a long period of time.

In response to this request, Technical Assistance shall be implemented aiming at improvement of management system for medical equipment and at long and effective use of medical equipment, by introducing preventive maintenance method, equipment register book and other formats necessary for maintenance work.

2-2-4-9 Implementation Schedule

Upon the signing of E/N between the Government of Eritrea and the Government of Japan, the work shown in the Table below shall be executed accordingly.

Table 2-13 Implementation Schedule



2-3 Obligations of the Recipient Country

The outlines of the scope of works on the Eritrean side are as follows;

(1) Installation Work

- To relocate and/or remove the existing equipment and prepare the place where the procured equipment will be installed (including the completion of surgical ward and X-ray ward in the Villagio Ginio Hospital)
- To provide temporary storage for the procured equipment within the Project site
- To provide access way for transportation of the procured equipment
- To provide water supply (with bulbs), drainage (with end caps), power supply (with receptacles, breakers), medical gas supply, reinforcement of foundations, and so on, which is necessary prior to equipment installation

(2) Infrastructure and Management Work

- To staff equipment user appropriately to each targeted hospital
- To ensure sufficient budget for maintenance of procured equipment
- To ensure that the procured equipment under the Project will be moved appropriately to the new sites when relocation plan of the targeted hospitals is implemented
- To take necessary measures on environmental issue, such as medical waste and chemical liquid waste, and also take appropriate measures on facilities for the safe use of equipment (including redo of the electric wiring in Agordat hospital)

(3) Others

- To bear commissions, namely advising commissions of an Authorisation to Pay (A/P) and payment commissions, to a Japanese bank for the banking services based upon the Banking Arrangement (B/A)
- To ensure prompt unloading and customs clearance of the products purchased under the Japan's Grant Aid at ports of disembarkation
- To exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in Eritrea with respect to the supply of the products and services under the verified contracts
- To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry into Eritrea and stay therein for the performance of their work
- To provide necessary permissions, licenses, and other authorisation for implementing the Project, if necessary
- To bear all the expenses, other than those covered by the Japan's Grant Aid, necessary for the Project

2-4 Project Operation Plan

2-4-1 Operation Plan

As already noted, this Project is supervised by the MOH, while implementing organization is International Cooperation Office under the Minister's Office of the MOH. Under the supervision of the International Cooperation Office, Department of Regulatory Service controls BEU, while Department of Health Services controls all of the local health service providers, through Zonal Management Office, such as Zonal and Sub-zonal hospitals.

Except for Villagio Ginio Hospital, the existing operation systems shall be utilized for this Project. Almost all of the health facilities in Eritrea, shortage of human resource is the largest problem. Procurement of medical equipment under the project will not directly cause operational problem because equipment planning was based on the existing staff allocation and because most of the equipment are renewals of the existing ones. Although MOH has no plan to increase health staff for this Project, the procured medical equipment will be fully utilized because Orotta School of Medicine will start producing as many as 30 doctors per year as from 2009 and because the MOH has a plan to integrate health staff educational organizations that are not under the MOH into the administration of MOH. Following table shows staff allocation of 3 targeted hospitals.

Table 2-14 Staff Allocation

	Halibet	Agordat	Massawa	Villagio Ginio
General Doctor	12	5	5	5
Special Doctor	21	1	1	1
Nurse	68	5	10	7
Associate Nurse	89	28	31	24
X-ray engineer	6	2	1	2
Pharmacist	9	1	2	5
Labo engineer	9	3	6	6
Other specialist	167	53	77	161
Total staff	381	98	133	211

Staff allocation plan for Villagio Ginio Hospital was confirmed by the MOH at the Basic Design Study stage as above. This plan is considered appropriate in comparison with that of Agordat and Massawa, which are of similar scale to Villagio Ginio. As indicated in the table of paramedics training plan below, this plan is judged appropriate and feasible. Major operational problem will not arise since equipment planning for this hospital was based on the submitted staff plan.

Table 2-15 Training Plan for Paramedics

Category	2006	2007	2008	2009	2010	2011
Nurse						
At school	147(90+57)	116	159	200	200	200
Admission	59	100	100	100	100	100
Total	206	216	259	300	300	300
Graduated	90	57	59	100	100	100
Total - Graduated	116	159	200	200	200	200
Pharmacists						
At school	50	Nil	30	nil	30	nil

Category	2006	2007	2008	2009	2010	2011
Admission	nil	30	Nil	30	nil	30
Total	50	30	30	30	30	30
Graduated	50	nil	30	nil	30	30
Total – Graduated	0	30	0	30	0	0
Clinical engineer						
At school	31	24	25	25	25	25
Admission	24	25	25	25	25	25
Total	55	49	50	50	50	50
Graduated	31	24	50	50	50	50
Total – Graduated	24	25	25	25	25	25
Dental technician						
At school	19	0	20	20	20	20
Admission	nil	20	20	20	20	20
Total	19	20	40	40	40	40
Graduated	19	Nil	20	20	20	20
Total – Graduated	0	20	20	20	20	20
X-ray engineer						
At school	15	11	15	15	15	15
Admission	11	15	15	15	15	15
Total	26	26	30	30	30	30
Graduated	15	11	15	15	15	15
Total - Graduated	11	15	15	15	15	15

Source : MOH

2-4-2 Maintenance Plan

Maintenance of procured equipment under the Project will be managed by Service Control (Quality Assurance) Division under the Department of Regulatory Service. Under the Service Control (Quality Assurance) Division, BEU is responsible for maintenance of medical equipment, while Pharmicor is responsible for procurement of medical equipment, spare parts, consumables and drugs.

Headed by a director, with 17 medical equipment engineers, 2 refrigerator technicians, 2 electrical mechanical engineers, 1 metal work engineer, 1 plumber, 1 wood worker, total 30 staff, BEU is in charge of maintenance of procured medical equipment under the Project. 6 staffs have experience of training seminar in foreign country. 9 new staffs will be added as from 2008. Testing and training equipment and tools procured under the Project will help BEU with maintenance of equipment much more effectively. Also, technical assistance as a soft component of the Project will help establish efficient computerized management system of equipment maintenance.

Pharmicor, headed by a director with 6 pharmacists, 25 engineers, 3 accountants, total 70 staffs, is responsible for procurement of medical equipment, spare parts, consumables and drugs. As there are limited number of local agent in Eritrea, Pharmicor is expected to play an important role in procurement of necessary goods for the medical equipment under the Project.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Project Cost Borne by the Eritrean side

Project cost borne by the Eritrean side is estimated to be Nakfa 199,054. (Japanese Yen 1.58 million)

Table below show the contents of the project cost.

Table 2-16 Project Cost Borne by the Eritrean Side

Category	Total
Electric wiring work at Agordat Hospital	160,090
Commission on Authorization to Pay (A/P)	38,964
Total	199,054

(2) Conditions of Estimation

Date of estimation	:	April, 2007
Exchange rate	:	NKF = Japanese Yen 7.92 (average of the past 6 months)
Procurement period	:	As shown in the Table 2-13
Others	:	Cost estimation is in accordance with the framework of Japanese grant aid scheme

2-5-2 Operation and Maintenance Cost

(1) Operation and Maintenance Budget

Budget for equipment operation and maintenance is not allocated for each health facility. It is requested by each health facility according to its need and the MOH, in response to the request, prepares the budget. Only as much as 0.5 to 1 % of the budget prepared by the MOH for each facility is used for equipment maintenance, which is used for minor repair or simple maintenance job. Each facility requests to BEU for equipment maintenance or to Pharmicor for procurement of goods, then BEU and Pharmicor apply for preparation of the budget.

Table below shows shift of MOH budget from 2002 to 06. Foreign assistance occupies as much as 50 % of the total MOH budget for the past 5 years, but its share is gradually becoming smaller year after year. Income from patient fees in 2006 grows almost double compared to that of 2002, showing the increase in own financial resources.

There was a 20 % decline in the expenditure of 2003 compared with the previous year, followed by slight increase in the subsequent year. This may be a negative consequence of decline in the country revenue as a result of huge draught in that year. As from 2005, however, there was a sign of recovery thanks to food aid and financial assistance from foreign countries, in which total expenditure rose 14 % in 2005 and 24 % in 2006, compared with 2002, respectively.

Table 2-17 Breakdown of MOH Income and Expenditure (Nakfa)

		2002	2003	2004	2005	2006
Income	MOH budget	177,921,057	174,108,536	200,429,312	218,414,205	236,844,515
	Patient fee	18,690,322	23,936,832	18,541,377	33,126,868	36,837,077
	Govt current expenditure	143,365,061	137,336,077	135,740,486	162,923,784	184,103,876
	Govt capital expenditure	15,865,674	12,835,627	46,147,449	22,363,553	15,903,562
	Foreign assistance	239,617,779	148,029,138	162,140,240	167,673,375	148,231,029
	Cash	58,165,279	36,344,154	35,106,293	30,558,520	77,561,697
	Pharmaceuticals	109,443,887	55,361,226	89,204,934	91,808,506	39,314,444
	Medical and Non-medical equipment	72,008,613	56,323,758	37,829,013	45,306,349	31,354,888
Total	398,848,515	298,200,844	344,028,177	352,960,715	385,075,544	
Expenditure		2002	2003	2004	2005	2006
	Salary	55,148,719	62,318,518	51,141,094	71,006,850	66,098,800
	Utilities	8,320,709	9,262,494	11,915,202	19,376,067	18,873,065
	Electricity	5,150,260	5,794,042	6,663,149	8,002,458	11,803,225
	Fuel	2,320,125	2,540,536	4,175,671	10,250,400	3,994,684
	Water	850,324	927,916	1,076,382	1,123,209	3,075,156
	Equipment procurement /Hospital management	73,037,022	57,287,233	38,785,252	46,093,523	32,204,561
	Medical equipment	33,022,921	33,197,691	15,561,913	27,616,755	20,720,546
	Non-Medical equipment	40,014,101	24,089,542	23,223,339	18,476,768	11,484,015
	Others	171,588,490	113,971,373	152,981,695	216,484,275	267,062,026
	Total	308,094,940	242,839,618	254,823,243	352,960,715	384,238,452

Source: MOH

As indicated in the table above, while salary, energy, fuel cost steadily increase, equipment procurement / hospital management cost decreases. In 2006, medical equipment cost is as much as 62 % decrease and non medical equipment cost is 28 % decrease, compared with 2002.

This can be assumed that the budget priority was low on maintenance of equipment which is after service life or which is difficult to procure spare parts for it was low. As already mentioned, not a little medical equipment donated from abroad are second hand equipment, with no operation manuals or maintenance manuals attached to it. Thus, it has been so difficult to repair or maintain those equipment; sometimes equipment, once broken, are left untouched.

With new equipment procured under the Project, and as new equipment being procured by the MOH itself, importance of equipment maintenance will be acknowledged and budgetary measures will be taken by the MOH.

(2) Maintenance Cost of the Equipment

Procured equipment will require the following cost for procurement of spare parts, consumables per year (refer to Appendices 10 for details).

Table 2-18 Maintenance Cost of Equipment per year

	Halibet	Agordat	Massawa	Villagio Ginio	BEU	Total
Medical Equipment	1,123,283	406,792	333,148	530,244	-	2,393,467
Non-Medical Equipment	-	-	-	-	61,794	61,794
Fuel	-	-	-	294,840	-	294,840
Total	-	-	-	-	-	2,750,101

Table below shows an estimation of MOH expenditure of the year 2009, in which the equipment will be procured under the Project. This estimation is based on an assumption that the Equipment procurement/hospital management will rise by 10%, backed by the increase in patient fees and MOH's own fund, MOH policy to gradually increase the equipment procurement cost and hospital management cost. It is also assumed that Salary will rise by 7% as the average increase rate from the year 02 to 06 was about 7% and that Electricity, Fuel and Water will rise by 24, 40 and 51%, respectively, as the average increase rate from the year 02 to 06 were 24, 40 and 51%, respectively.

Table 2-19 Estimated MOH Expenditure in 2009 (Nakfa)

	2007	2008	2009
Salary	70,725, '16	75,676, '16	80,973, '72
Utilities	19,816, '18	20,807, '54	21,847, '32
Electricity	14,635, '99	18,148, '39	22,504, '12
Fuel	5,592, '58	7,829, '81	10,961, '13
Water	4,643, '86	7,011, '63	10,587, '11
Equipment procurement /Hospital management	35,425, '17	38,967, '19	42,864, '71
Medical equipment	22,792, '01	25,071, '61	27,579, '47
Non-Medical equipment	12,632, '17	13,895, '58	15,285, '24

On the other hand, table below shows an estimation of MOH income of the year 2009. This estimation is based on an assumption that the Budget will rise by 8% because the average increase rate from the year 02 to 06 was about 8%. Foreign assistance will rise -9% as the average increase rate from the year 02 to 06 was about -9%.

Table 2-20 Estimated MOH Income in 2009 (Nakfa)

	2007	2008	2009
MOH budget	255,792, '76	276,255, '42	298,355, '78
Patient fee	39,784, '43	42,966, '67	46,404, '08
Govt current expenditure	198,832, '86	214,738, '61	231,917, '62
Govt capital expenditure	17,175, '47	18,549, '15	20,033, '08
Foreign assistance	133,407, '26	120,067, '33	108,060, '20
Cash	69,805, '27	62,824, '75	56,542, '77
Pharmaceuticals	35,383, '00	31,844, '00	28,660, '30
Medical and Non-medical equipment	28,219, '99	25,397, '59	22,857, '13
Total	389,200, '02	396,322, '76	406,416, '98

As indicated in the Table 2-18, maintenance cost for medical equipment under the Project is estimated Nakfa 2,393,467, which is 8.7 % of the medical equipment cost in 2009 (Nakfa 27,579,047). Maintenance cost for non-medical equipment is estimated Nakfa 61,794, which is 0.4 % of non-medical equipment cost 2009 (Nakfa 15,285,224). Fuel cost that will be necessary for Generator under the Project is estimated Nakfa 294,840, which is 2.7 % of the fuel cost in 2009 (Nakfa 10,961,413).

The MOH budget is estimated to rise to Nakfa 298,355,878 by the year 09, backed by relatively steady increase from 02 to 06, as shown in the Table 2-17. The increase in the maintenance cost of equipment caused by the procurement of equipment under the Project (Nakfa 2,750,101) will be as much as 0.9% against the estimated MOH budget in the year 09. The Table 2-20 indicates that the MOH's total income including the Foreign assistance will continue to rise. Furthermore, a person in charge of the Project in the MOH affirmed that the first priority in securing the budget for equipment maintenance would be given to the equipment procured by the Japanese people's tax.

Based on the estimations above, the maintenance cost for the medical, non-medical equipment and fuel for the generator procured under the Project will be sufficiently secured by the MOH.

Chapter 3. Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

Eritrea, since its independence in 1993, had implemented various health programs based on the infrastructures established during the Ethiopian rule. Much of those health infrastructures, however, were devastated by the war against Ethiopia, which broke out in 1998 as a result of border demarcation of the both countries. After the war, the MOH hammered out series of health programs which focused on improvement of primary health care, including restoration of war-damaged health centers and health stations. As a result of these programs, major health indicators have improved as people's accessibility to primary health increased. Then, the MOH has shifted the target of development from primary services to improvement of secondary and tertiary services. But they face many challenges, such as delay in renovation of health facilities in urban area, delay in procurement of medical equipment due to budgetary reasons. There also are so many secondary health facilities that can not provide proper health services to its people due to lack of medical staff.

Besides enormous efforts of the MOH, foreign governments or international organizations have played an important role in restoration of the post-war health infrastructures of Eritrea. Unfortunately, much of medical equipment donated by those countries or organizations was used equipment, with no operation manuals, no maintenance manuals attached to it. This did not enhance the necessity of equipment management among the users. The users would not do the daily check-ups on equipment, repair and reuse it, more precisely, they just did not know how to manage and maintain the equipment. Now, to improve the situation of equipment maintenance, importance of BEU, which works for maintenance of medical equipment and training of maintenance staff, has become larger than ever before.

Implementation of the Project will help overcome these challenges described above, and produce the following effects.

Table 3-1 Effects of the Requested Japanese Assistance

Actual situations/ Problems	Measures taken by the Requested Japanese Assistance	Direct Effects/ Improvements	Direct Effects/ Improvements
Patients can not receive appropriate medical services in the targeted hospitals due to lack of medical equipment.	Procurement of medical equipment for the central function of the facilities (Operation, X-ray, Emergency, Laboratory and OB/NY department)	Number of operation, radiological diagnosis, laboratory test and delivery will increase	Secondary health providing level will improve in the target areas and the referral system will be completed
BEU can not provide appropriate services due to lack of repair and testing equipment.	Procurement of repair, testing and training equipment	Number of repair work will increase	Medical equipment procured under the Project will be used effectively and for a long period of time.
BEU has difficulties in efficient repair work due to delay in maintenance system development. Also BEU has not developed yet an instruction system for preventive equipment maintenance intended for hospital users.	Technical assistance for management of medical equipment maintenance and instruction for workshop	BEU will be able to make a procurement plan for consumables and spare parts. BEU will be able to organize workshop for hospital staff	

3-2 Recommendations

It is advised that the MOH may take the following issues into consideration so that the effects of the Project will be sustained more efficiently.

- (1) There are no regulations regarding disposal and treatment of medical wastes. The MOH is working to establish National Health-Care Waste Management Plan. The medical wastes produced from the equipment under the Project, if any, should be treated in accordance with this regulation, when it is enforced.

- (2) There are limited numbers of local agents of medical equipment in Eritrea, so maintenance of medical equipment will be done by BEU. Workshop skill will be instructed by the technical assistance (soft component) for BEU so that maintenance skills of hospital staff may increase. BEU is further requested to continue to organize the workshops even after the soft component period is finished.

[Appendices]

1. Member List of the Study Team
2. Study Schedule
3. List of Parties Concerned in the Recipient Country
4. Minutes of Discussions (Basic Design)
5. Minutes of Discussions (Draft Report Explanation)
6. Examination of Requested Equipment
7. Equipment List
8. Outline of Major Equipment
9. Equipment Delivery List
10. Operation and Maintenance Cost for Equipment
11. Soft Component (Technical Assistance) Plan
12. References

Appendices-1 Member List of the Study Team

Member List

1. Basic Design Study

No.	Name	Job Title	Occupation
1	Mr. Hideaki HARADA	Team Leader	Group Director Project Management Group II Grant Aid Management Department JICA
2	Dr. Yujiro HANDA	Technical Advisor	Project Formulation Advisor (Health) JICA Regional Support Office for Eastern and Southern
3	Mr. Junya HIROSHIMA	Technical Cooperation	Staff Health Administration Team, Group III Human Development Department
4	Ms. Minako KURAMITSU	Project Coordinator	Staff Health Team Project Management Group II Grant Aid Management Department JICA
5	Mr. Shigehito AKAGI	Project Leader / Equipment Planning I	General Manager, Economic Cooperation Department, Overseas Project Division International Total Engineering Corporation (ITEC)
6	Mr. Hironori NAKAJIMA	Equipment Planning II	Deputy General Manager, Economic Cooperation Department, Overseas Project Division International Total Engineering Corporation (ITEC)
7	Mr. Yasuhiro HIRUMA	Medical Equipment Maintenance Planning / Facilities and Utilities	Consultant International Total Engineering Corporation (ITEC)
8	Ms. Tomomi TAKENAKA	Procurement / Cost Planning	Deputy General Manager, Economic Cooperation Department, Overseas Project Division International Total Engineering Corporation (ITEC)

2. Draft Report Explanation

No.	Name	Job Title	Occupation
1	Dr. Yujiro HANDA	Team Leader	Project Formulation Advisor (Health) JICA Regional Support Office for Eastern and Southern
2	Ms. Sayaka NAKAMURA	Project Coordinator	Staff Health Team Project Management Group II Grant Aid Management Department JICA
3	Mr. Shigehito AKAGI	Project Leader / Equipment Planning I	General Manager, Economic Cooperation Department, Overseas Project Division International Total Engineering Corporation (ITEC)
4	Mr. Hironori NAKAJIMA	Equipment Planning II	Deputy General Manager, Economic Cooperation Department, Overseas Project Division International Total Engineering Corporation (ITEC)

Appendices-2 Study Schedule

SCHEDULE OF BASIC DESIGN STUDY

			Government Member			Consultant Member				
			Hideaki HARADA, Junya HIROSHIMA	Yujiro HANDA	Minako KURAMITSU	Shigehito AKAGI	Hironori NAKAJIMA	Yasuhiro HIRUMA	Tomomi TAKENAKA	
			Team Leader, Technical Cooperation	Technical Adviser	Project Coordinator	Project Manager/ Equipment PlannerI	Equipment PlannerII	Medical Equipment Maintenance/ Facility Planner	Procurement and Cost Planner	
1	12-Jan	Fri	AM				NRT-FRA (LH71) 1030-1410			
2	13-Jan	Sat	AM				FRA-ASM (LH592) 1250-2225			
3	14-Jan	Sun	AM				Team Meeting			
4	15-Jan	Mon	AM				Courtesy Call and Meeting at Ministry of National Development and MOH (Explanation of IR, Confirmation of Study Schedule, Submission of Questionnaire) Asmara → Massawa			
5	16-Jan	Tue	AM				Survey on Massawa Hos.			
6	17-Jan	Wed	AM				Survey on Massawa Hos. Massawa → Asmara			
7	18-Jan	Thur	AM				Asmara → Agordat Survey on Agordat Hos.			
8	19-Jan	Fri	AM				Survey on Agordat Hos.			
9	20-Jan	Sat	AM				Agordat → Asmara			
10	21-Jan	Sun	AM	NRT1230- FRA1635 (NH209)	DXM1740- ASM2205 (B8375)	NRT1230- FRA1635 (NH209)	Team Meeting			
11	22-Jan	Mon	AM	FRA1250- ASM2225 (LH592)		FRA1250- ASM2225 (LH592)	Survey on Villaggio Ginio Hos.			
12	23-Jan	Tue	AM	Discussion with MOH			Same as Government member	Survey on BEU		NRT1030- FRA1410 (LH711)
13	24-Jan	Wed	AM	Survey on BEU			Same as Government member	Survey on Halibet Hos.		FRA1250- ASM2225 (LH592)
14	25-Jan	Thu	AM	Survey on Villaggio Ginio Hos.			Same as Government member	Survey on Halibet Hos.		
15	26-Jan	Fri	AM	Survey on Halibet Hos. Discussion with MOH						
16	27-Jan	Sat	AM	Discussion on "Minutes of Discussions"			Same as Government member			
17	28-Jan	Sun	AM	Survey on related facilities in Asmara			Same as Government member			
18	29-Jan	Mon	AM	Team Meeting			Team Meeting			
19	30-Jan	Tue	AM	Signing on "Minutes of Discussions"	ASM0900- DXB1510(B8374)	Signing on "Minutes of Discussions"	Same as Government member			
20	31-Jan	Wed	AM	ASM0005 - FRA0635 (LH593) FRA2045-→		ASM0005 - FRA0635 (LH593) LON2035-→	Asmara → Agordat Survey on Agordat Hos. → Asmara		Survey on local agent	
21	1-Feb	Thu	AM			NBO0800 (BA89) Courtesy call to Embassy of Japan and JICA office NBO2335-→	Survey on Halibet Hos. Survey on Villaggio Ginio Hos.		Survey on local agent	
22	2-Feb	Fri	AM			DXB0535 (EK722) DXB0940- HKG2140 (EK380)	Asmara → Massawa Survey on Massawa Hos.		Survey on local agent	
23	3-Feb	Sat	AM			HKG0955- NRT1445 (NH912)	Survey on Massawa Hos. Massawa → Asmara		Survey on local agent (Collection of quotation)	
24	4-Feb	Sun	AM				Team Meeting			ASM0005-FRA0635 (LH593) FRA1510-LON1550
25	5-Feb	Mon	AM				Team Meeting			NBO0800 (BA089)
26	6-Feb	Tue	AM				Discussion with Pharmicor Survey on Villaggio Ginio Hos.		Discussion with BEU	Survey on local agent
27	7-Feb	Wed	AM				Survey on Halibet Hos. Confirm the answer of Questionnaire		Discussion with BEU	Survey on local agent NBO1715-DXB2315
28	8-Feb	Thur	AM				Report to MOH			Survey on local agent
29	9-Feb	Fri	AM				ASM0005-FRA0635 (LH593) FRA1330-NRT0835 (LH710)+1			Survey on local agent
			AM				NRT			DXB0300-ICN1645 (EK322) ICN1800-NRT2020 (JL954)

Note : NRT Narita
 FRA Frankfurt
 ASM Asmara
 DXB Dubai
 LON London
 NBO Nairobi
 HKG Hong Kong
 ICN Yingcheng

SCHEDULE OF EXPLANATION OF DRAFT REPORT

				Government Member		Consultant Member	
				Yujiro HANDA	Sayaka NAKAMURA	Shigehito AKAGI	Hironori NAKAJIMA
				Team Leader	Project Coordinator	Project Manager / Equipment Planner I	Equipment Planner II
1	15-May	Tue	AM PM			NRT→FRA 0955-1435	
2	16-May	Wed	AM PM			FRA→ASM 1250-2130	
3	17-May	Thur	AM PM			Cautesy call to Ministry of Finance and MOH, Discussior Asmara → Massawa	
4	18-May	Fri	AM PM			Discussion with Massawa Hos. (Explanation of Draft Report) Massawa → Asmara	
5	19-May	Sat	AM PM			Team meeting	
6	20-May	Sun	AM PM	NBO→ASM 0800-1345	NRT-FRA 1135-1635	Asmara → Agordat (Canceled because of the problem on permission for travel) → Asmara	
7	21-May	Mon	AM PM	Discussion with MOH	FRA→ASM 1245→2125	Asmara → Agordat Discussion with Agordat Hos. (Explanation of Draft Report) Agordat → Asmara	
8	22-May	Tue	AM PM	Cautesy call to Ministry of Finance and MOH, Discussior Discussion with Halibet Hos., BEU, and Villagio Ginio Hos. (Explanation of Draft Report) Discussion with MOH			
9	23-May	Wed	AM PM	Discussion with MOH			
10	24-May	Thur	AM PM	Team Meeting (Holiday of Eritrea)			
11	25-May	Fri	AM PM	Discussion on "Minutes of Discussions" Signing on "Minutes of Discussions"			
12	26-May	Sat	AM PM	ASM→NBO 0930-1515		ASM→FRA 2305-0615	
13	27-May	Sun	AM PM		FRA→ 2045	FRA→ 1350	
14	28-May	Mon	AM PM		NRT 1450	NRT 745	

Note : NRT Narita
FRA Frankfurt
ASM Asmara
NBO Nairobi

Appendices-3 List of Parties Concerned in the Recipient Country

List of Parties Concerned in the Recipient Country

[Basic Design Study]

1. Ministry of Health

- | | | |
|----|--------------------------|--|
| 1) | Dr. Mathewos Woldu | Economic Advisor, Ministry of National Development |
| 2) | Mr. Solomon Tecele | Senior Expert, Ministry of National Development |
| 3) | Dr. Ghermai Tesfasellasi | Director, International Cooperation Office,
Minister Office, Ministry of Health |
| 4) | Mr. Bernando Kifleyes | Director General, Regulatory Services Department,
Ministry of Health |
| 5) | Dr. Berhane Debru | Director, Health Services Department, Ministry of Health |
| 6) | Dr. Andom Ogbomariam | Director General, Research & Human Recourse,
Development, Ministry of Health |
| 6) | Dr. Werede Mesfun | Zobal Health Officer, Maekel Regional Health Office,
Ministry of Health |

2. Biomedical Engineering Unit

- | | | |
|----|-----------------|--|
| 1) | Mr. Ogbamichael | Director, Medical Engineering Unit, Ministry of Health |
|----|-----------------|--|

3. Halibet Hospital

- | | | |
|----|--------------------|--|
| 1) | Dr. Beyene Tewelde | Medical Director, Halibet Hospital |
| 2) | Mr. Afewerbi | Head Nurse, Operation Room, Halibet Hospital |
| 3) | Dr. Russom Embaie | Head, Radiology Department, Halibet Hospital |
| 4) | Ms. Adhanet | Dental Clinician, Halibet Hospital |

4. Agordat Hospital

- | | | |
|----|---------------------|----------------------------|
| 1) | Dr. Dawit Estifanos | Director, Agordat Hospital |
|----|---------------------|----------------------------|

5. Massawa Hospital

- | | | |
|----|-------------------------|---|
| 1) | Dr. Selemone Ghebrehier | Director, Massawa Hospital |
| 2) | Mr. Abraham Yemone | Northern Red Sea Regional Health Office, Ministry of Health |
| 3) | Mr. Michael Mesfun | Zobal Administrator, Massawa Zobal Office |

6. Orotta National Referral Hospital

- | | | |
|----|-------------------|-----------------------------------|
| 1) | Dr. Yemane Seyoum | Medical Director, Orotta Hospital |
|----|-------------------|-----------------------------------|

7. Pharmecor Eritrea

- | | | |
|----|-----------------------|-------------------|
| 1) | Mr. Yamane Zeremariam | Marketing Manager |
|----|-----------------------|-------------------|

JICA Eritrea Office

- | | | |
|----|-----------------------|---------------------|
| 1) | Mr. Michael Stephanos | Liaison Officer |
| 2) | Mr. Tadahiro Sasaki | Expert |
| 3) | Mr. Takashi Inoue | Project Coordinator |

[Draft Report Explanation]**1. Ministry of Health**

- | | | |
|----|--------------------------|--|
| 1) | Mr. Saleh Meki | Minister |
| 2) | Dr. Ghermai Tesfasellasi | Director, International Cooperation Office,
Minister Office |
| 3) | Dr. Berhane Debru | Director, Medical Services Division |
| 4) | Mr. Kessete Teweldebrham | Anesthesia Director |
| 5) | Dr. Regbe Samuel | Head of Nursing and Quality Assurance Division |

2. Ministry of Finance

- | | | |
|----|--------------------|-------------|
| 1) | Mr. Berhane Abrehe | Minister |
| 2) | Mr. Efrem Testai | Coordinator |

3. Biomedical Engineering Unit

- | | | |
|----|----------------------|---------------------|
| 1) | Mr. Ogbamichael | Director |
| 2) | Mr. Rafael Pompa | Technician |
| 3) | Mr. Mohammed | Biomedical Engineer |
| 4) | Mr. Ghirmaixitt Zena | Technician |
| 5) | Mr. Ghirmay Gebre | OR Technician |
| 6) | Ms. Freweini Fkada | Technician |

3. Halibet Hospital

- | | | |
|----|--------------------|------------------|
| 1) | Dr. Beyene Tewelde | Medical Director |
|----|--------------------|------------------|

4. Agordat Hospital

- | | | |
|----|---------------------|----------|
| 1) | Dr. Dawit Estifanos | Director |
|----|---------------------|----------|

5. Massawa Hospital

- | | | |
|----|------------------------|----------|
| 1) | Dr. Selemon Ghebrehier | Director |
|----|------------------------|----------|

6. Villagio Ginio Hospital

- | | | |
|----|-------------------|--|
| 1) | Dr. Werede Mesfun | Zobal Health Officer, Maekel Regional Health Office,
Ministry of Health |
|----|-------------------|--|

JICA Eritrea Office

- | | | |
|----|-----------------------|-----------------|
| 1) | Mr. Michael Stephanos | Liaison Officer |
| 2) | Mr. Tsuneo Tsurusaki | Expert |

Appendices-4 Minutes of Discussions (Basic Design)

**MINUTES OF DISCUSSIONS
OF THE BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF
COMMUNITY HEALTH SERVICE
IN THE STATE OF ERITREA**

Based on the results of the Preliminary Study, the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of Community Health Service (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the State of Eritrea (hereinafter referred to as "Eritrea") the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Hideaki Harada, Group Director, Project Management Group II, Grant Aid Management Department, JICA, and is scheduled to stay in the country from January 13th to February 8th.

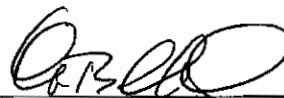
The Team held discussions with the officials concerned of the Government of Eritrea and conducted field surveys at the study areas.

In the course of discussions and field surveys, both parties confirmed the main items described in the attached documents. The Team will proceed to further works and prepare the Basic Design Study Report.

Asmara, 29th January, 2007



Mr. Hideaki HARADA
Leader
Basic Design Study Team
Japan International Cooperation Agency



Dr. Ghermai Tesfasellasi
Director
International Cooperation Office
Ministry of Health
Eritrea



Dr. Mathewos Woldu
Economic Advisor
Ministry of National Development
Eritrea

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve quality of basic health service provided by the targeted hospitals as well as maintenance service provided by the Biomedical Engineering Unit through procurement of necessary equipment.

2. Project site

The project sites are Halibet Hospital, Villagio Ginio Hospital, Massawa Hospital, Agordat Hospital and Biomedical Engineering Unit as shown in Annex-1 of the Minutes of Discussions on the Preliminary Study signed by both parties on August 9th, 2006.

3. Responsible and Implementing Agency

3-1. The Responsible Agency is the Ministry of Health. The organization chart is shown in Annex-2(A) of the Minutes of Discussions on the Preliminary Study signed by both parties on August 9th, 2006.

3-2. The Implementing Agencies are the Halibet Hospital, Villagio Ginio Hospital, Massawa Hospital, Agordat Hospital and Biomedical Engineering Unit. Their organization charts are shown in Annex-2(B), 2(C), 2(D), 2(E), 2(F) of the Minutes of Discussions on the Preliminary Study signed by both parties on August 9th, 2006.

4. Items requested by the Government of Eritrea

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

5. Japan's Grant Aid Scheme

The Government of Eritrea understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Eritrea as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions on the Preliminary Study signed by both parties on August 9th, 2006.

6. Schedule of the Study

6-1. The consultants will proceed to further studies in Eritrea until February 8th, 2007.

6-2. JICA will prepare the draft report on the Basic Design Study in English and dispatch a mission in order to explain its contents around May 2007.

6-3. In case that the contents of the said draft report is accepted in principle by the Government of Eritrea, JICA will complete the final report on the Basic Design Study and send it to the Government of Eritrea by August 2007.

7. Other relevant issues

7-1. Staff Allocation

The Government of Eritrea promised to secure and assign necessary staff to the targeted hospitals of the Project and to the Biomedical Engineering Unit.



In particular, the Government of Eritrea explained that one dentist and one dental therapist will be assigned to Massawa Hospital by the end of January 2007 and that one ophthalmic officer will be assigned to Agordat Hospital by July 2007.

As for the Villagio Ginio Hospital, the Government of Eritrea promised to assign necessary staff according to the plan described in Annex-2 before the procurement of equipment under the Project. In this regard, the Government of Eritrea explained that the remaining construction of the surgical wing and the radiology department at the Villagio Ginio Hospital will be completed by the end of 2007.

7-2. Operation and Maintenance of Equipment

The Government of Eritrea understands that securing sufficient budget for maintenance, repair, and procurement of consumables is indispensable for sustainable use of medical equipment and promised to secure and allocate sufficient budget to operate and maintain the equipment to be procured under the Project.

The Government of Eritrea promised to fully utilize and well maintain the procured equipment under the Project regardless of the relocation plan of Massawa Hospital or the renovation plan of Halibet Hospital. The Government of Eritrea also promised that when these relocation and renovation plans are implemented, the equipment procured under the Project will be moved securely and appropriately to the new sites.

7-3. Electricity

The Government of Eritrea promised to increase the amount of incoming electricity and redo the electrical wiring at the targeted hospitals, if it is necessary for the installation of equipment to be procured under the Project. In particular, necessary measures will be taken at the Agordat Hospital by the Government of Eritrea before the procurement of equipment under the Project.

7-4. Issues on Medical Waste

The Team explained their concerns on how chemical liquid waste such as photographic developing and fixing solution for X-ray film is currently being discharged to the general drainage. The Government of Eritrea promised to take necessary measures on this environmental issue.

7-5. Walls of X-ray Rooms

The Government of Eritrea promised to take appropriate protection measures for the installation of X-ray machines, such as covering the walls of the X-ray rooms with lead or concrete, if necessary.

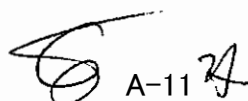
7-6. Tax Exemption

The Government of Eritrea will exempt Japanese nationals who will be engaged in the Project, from all duties including import tax and related fiscal charges, which may be imposed in Eritrea with respect to the procurement of equipment, materials and services supplied under the verified contract.

7-7. Soft Component

The Government of Eritrea requested the consultant services for operation and maintenance on

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the equipment to be procured under the Project as one of the components of the Grant Aid (soft component).

7-8. Collaboration with Technical Cooperation Project

To maximize the effect of the Project, the Government of Eritrea expressed their continued expectation for the realization of technical cooperation project to improve management practice of medical equipment at government hospitals, which request has been submitted to the Government of Japan on August 21st, 2006. Taking into the results of the Basic Design Study, JICA will further assess the appropriateness of the request and will recommend to the Government of Japan for approval.

7-9. Confidentiality of the Project

Both parties confirmed to keep all the information related to the Project confidential and promised not to disclose any information until the opening of tender.

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A.

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Halibet

BD No.	BD Description
	OPERATION THEATER
HAL OP-01	Echocardiogram unit
HAL OP-02	ECG
HAL OP-03	Defibrillator with ECG monitor
HAL OP-04	Patient monitor with oxymeter
HAL OP-05	Blood gas analyzer
HAL OP-06	Per fusers
HAL OP-07	Suction pump
HAL OP-08	Endoscope
HAL OP-09	Colonoscope
HAL OP-10	Rectoscope
HAL OP-11	Sigmoidscope
HAL OP-12	Endoscope video system
HAL OP-13	Monitor for gastro-intestinal
HAL OP-14	Patient monitor
HAL OP-15	Anesthesia tables
HAL OP-16	Anesthesia machine
HAL OP-17	Operation light, mobile
HAL OP-18	Cautery unit
HAL OP-19	Autoclave
HAL OP-20	X-ray unit, C-arm
HAL OP-21	Drill, electrical
HAL OP-22	Doppler machine
HAL OP-23	Stretcher
HAL OP-24	Operation table
	IMAGING DIAGNOSIS AND RADIOLOGY
HAL RD-01	X-ray unit, general
HAL RD-02	Ultrasound unit
	LABORATORY
HAL LB-01	Centrifuge
HAL LB-02	Drying oven
HAL LB-03	Distiller
HAL LB-04	Refrigerator
HAL LB-05	Microscope, binocular
HAL LB-06	ELISA machine
HAL LB-07	Blood cell counter
HAL LB-08	Haematology analyzer
	ENT
HAL EN-01	Microscope, ENT
HAL EN-02	Telescope set
HAL EN-03	Examination light, mobile
HAL EN-04	Instrument set for nasal and plastic
HAL EN-05	Retinoscope
	BURN
HAL BN-01	Electrical dermatomes
HAL BN-02	Patient monitor
HAL BN-03	Per fusers
HAL BN-04	Blood gas and electrolyte analyser
	ORTHOPEDIC
HAL OR-01	Operation table
HAL OR-02	Saw, electrical
HAL OR-03	Gypsum cutter
	DENTAL
HAL DT-01	Dental unit
HAL DT-02	Instrument set for dental
HAL DT-03	Dental scaler
	MISCELLANEOUS

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A-13

R

BD No.		BD Description
HAL	MS-01	Solar panel
HAL	MS-02	Generator, 150KVA
DIABETES THERAPY		
HAL	DI-01	Vascular doppler for diabetes patients
HAL	DI-02	Oxymeter
HAL	DI-03	Slit lamp
HAL	DI-04	Physiotherapy equipment set

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BD No.		BD Description
Agordat		
OPERATION THEATER		
AGO	OP-01	Operation table
AGO	OP-02	Operation light, mobile
AGO	OP-03	Operation stool
AGO	OP-04	Instrument cabinet
AGO	OP-05	Instrument trolley
AGO	OP-06	Cupboard, drug
AGO	OP-07	Suction pump
AGO	OP-08	ECG
AGO	OP-09	Anesthesia machine
AGO	OP-10	Laryngoscope set
AGO	OP-11	Oxygen regulator set
AGO	OP-12	Flowmeter Oxygen
AGO	OP-13	Nebulizer
AGO	OP-14	Suction pump
AGO	OP-15	Cautery unit
EMERGENCY DEPARTMENT		
AGO	EM-01	Examination table
AGO	EM-02	Sphygmomanometer
AGO	EM-03	Stethoscope
AGO	EM-04	Stretcher
AGO	EM-05	Wheel chair, foldable
AGO	EM-06	Instrument cabinet
AGO	EM-07	Instrument trolley
AGO	EM-08	Boiling sterilizer
AGO	EM-09	Ophthalmoscope, electrical
AGO	EM-10	Instrument trolley
AGO	EM-11	I.V. stand
AGO	EM-12	Cautery unit
AGO	EM-13	Plaster bandage table
AGO	EM-14	Gypsum cutter, electrical
AGO	EM-15	Suction pump
AGO	EM-16	Ambu bag set
AGO	EM-17	Instrument set for gypsum
AGO	EM-18	Stretcher
AGO	EM-19	Patient monitor
AGO	EM-20	Defibrillator with ECG monitor
AGO	EM-21	Emergency cart
AGO	EM-22	Pulse oxymeter
AGO	EM-23	Examination light, mobile
AGO	EM-24	Infusion pump
AGO	EM-25	Bowl stand
AGO	EM-26	Defibrillator
AGO	EM-27	Patient monitor
AGO	EM-28	ECG, 3 channel
AGO	EM-29	Lung function tester
AGO	EM-30	Oxygen concentrator
AGO	RD-01	X-ray unit, C-arm
AGO	RD-02	X-ray film viewer
AGO	RD-03	X-ray film holder
AGO	RD-04	Dark room equipment
LABORATORY		
AGO	LB-01	Microscope, binocular
AGO	LB-02	Haematology analyzer
AGO	LB-03	Centrifuge
AGO	LB-04	Shaker
AGO	LB-05	Drying oven

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BD No.	BD Description
	GENERAL
AGO GN-01	Screen
AGO GN-02	May Table
AGO GN-03	Examination light, mobile
AGO GN-04	Refrigerator
	PHYSIOTHERAPY EQUIPMENT
AGO PT-01	Physiotherapy unit, mobile
AGO PT-02	Shortwave therapy unit
AGO PT-03	Muscle stimulator
AGO PT-04	Infrared lamp
AGO PT-05	Ultrasound therapy unit
AGO PT-06	Interferential therapy unit
AGO PT-07	Exercise mat
AGO PT-08	Universal foot pump
AGO PT-09	Traction table
AGO PT-10	Overhead frame
AGO PT-11	Duplex pulley weight system for wall
AGO PT-12	Electro-stimulator
AGO PT-13	Puch up block set
AGO PT-14	Parallel bars
AGO PT-15	Clamp for fitting fixation straps
AGO PT-16	Chest belt
AGO PT-17	Hip belt
AGO PT-18	Neck harness
AGO PT-19	Weight set
	GYNECOLOGY AND OBSTETRICS EQUIPMENT
AGO OG-01	Delivery bed
AGO OG-02	Ultrasound unit, B/W
AGO OG-03	Operation light, mobile
AGO OG-04	Anesthesia machine
AGO OG-05	Oxygen flowmeter
AGO OG-06	Operation table
AGO OG-07	Autoclave
AGO OG-08	Vacuum extractor
AGO OG-09	Water bath
AGO OG-10	Drying oven
AGO OG-11	Infant incubator
AGO OG-12	Infant warmer
AGO OG-13	Suction pump
	DENTAL EQUIPMENT
AGO DT-01	Amalgam mixer
AGO DT-02	X-ray unit, dental
AGO DT-03	Dental film holder
AGO DT-04	Examination light, mobile
AGO DT-05	Dental mastoid drill unit complete
AGO DT-06	Dental unit
AGO DT-07	Dental aspirator
AGO DT-08	Autoclave, dental
	OPHTHALMIC EQUIPMENT
AGO OT-01	Sight test panel
AGO OT-02	Slit lamp
AGO OT-03	Examination chair, eye
AGO OT-04	Trial lens, adult
AGO OT-05	Trial lens, child
AGO OT-06	Retinoscope
AGO OT-07	Refractometer
AGO OT-08	Tonometer
AGO OT-09	Operation microscope
AGO OT-10	Pen light

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BD No.		BD Description
AGO	OT-11	Ophthalmoscope, electrical
AGO	OT-12	Ophthalmoscope, battery
AGO	OT-13	Ophthalmoscope, direct
AGO	OT-14	Ophthalmoscope, indirect
AGO	OT-15	Examination light, mobile
AGO	OT-16	Chart for near vision test
AGO	OT-17	Snellen's chart, E-type
MISCELLANEOUS		
AGO	MS-01	Laundry machine
AGO	MS-02	Solar panel

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ZA

BD No.		BD Description
Massawa		
OPERATION THEATER		
MAS	OP-01	Operation light, mobile
MAS	OP-02	Operation table
MAS	OP-03	ECG
MAS	OP-04	Defibrillator
MAS	OP-05	Pulse oxymeter
MAS	OP-06	Oxygen concentrator
MAS	OP-07	Suction pump
MAS	OP-08	Vacuum extractor
MAS	OP-09	Cautery unit
EMERGENCY DEPARTMENT		
MAS	EM-01	Examination table
MAS	EM-02	Stretcher
MAS	EM-03	Wheel chair, foldable
MAS	EM-04	Instrument cabinet
MAS	EM-05	Instrument trolley
MAS	EM-06	Boiling sterilizer
MAS	EM-07	Ophthalmoscope, battery
MAS	EM-08	Instrument trolley
MAS	EM-09	I.V. stand
MAS	EM-10	Cautery unit
MAS	EM-11	Plaster bandage table
MAS	EM-12	Gypsum cutter, electrical
MAS	EM-13	Suction pump
MAS	EM-14	Ambu bag set
MAS	EM-15	Instrument set for gypsum
MAS	EM-16	Stretcher
MAS	EM-17	Patient monitor
MAS	EM-18	Defibrillator
MAS	EM-19	Emergency cart
MAS	EM-20	Pulse oxymeter
MAS	EM-21	Examination light, mobile
MAS	EM-22	Infusion pump
MAS	EM-23	Bowl stand
MAS	EM-24	Defibrillator
MAS	EM-25	Patient monitor
MAS	EM-26	ECG, 3 channel
MAS	EM-27	Lung function tester
MAS	EM-28	Oxygen concentrator
IMAGING DIAGNOSIS		
MAS	RD-01	X-ray unit, general
MAS	RD-02	X-ray unit, mobile
MAS	RD-03	Automatic developer
MAS	RD-04	Ultrasound unit, B/W
MAS	RD-05	Doppler Ultrasound Fetal heart beat detector
MAS	RD-06	Sigmoidoscope
LABORATORY		
MAS	LB-01	Microscope, binocular
MAS	LB-02	Haematology analyzer
MAS	LB-03	Centrifuge
MAS	LB-04	Shaker
MAS	LB-05	Drying oven
OPHTHALMIC SECTION		
MAS	OT-01	Operation microscope
MAS	OT-02	Slit lamp
MAS	OT-03	Examination chair, eye
MAS	OT-04	Trial lens, adult
MAS	OT-05	Trial lens, child

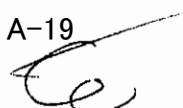
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BD No.		BD Description
MAS	OT-06	Retinoscope
MAS	OT-07	Refractometer
MAS	OT-08	Tonometer
MAS	OT-09	Keratometer
MAS	OT-10	Lensmeter
MAS	OT-11	Fundus camera
MAS	OT-12	Ophthalmic loupe
MAS	OT-13	Pen light
MAS	OT-14	Slit microscope
MAS	OT-15	Ophthalmoscope, electrical
MAS	OT-16	Ophthalmoscope, battery
MAS	OT-17	Ophthalmoscope, direct
MAS	OT-18	Ophthalmoscope, indirect
MAS	OT-19	Examination light, mobile
MAS	OT-20	Snellen's chart, E-type
DENTAL UNIT		
MAS	DT-01	Amalgam mixer
MAS	DT-02	X-ray unit, dental
MAS	DT-03	Dental film holder
MAS	DT-04	Operating light dental
MAS	DT-05	Dental mastoid drill unit complete
MAS	DT-06	Dental unit
MAS	DT-07	Dental aspirator
FIXED HOSPITAL EQUIPMENT AND MISCELLANEOUS SUPPLIES		
MAS	MS-01	Generator, 150KVA
MAS	MS-02	Solar panel
MAS	MS-03	Infant incubator
MAS	MS-04	Refrigerator
MAS	MS-05	Autoclave, dental

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BD No.		BD Description
Villagio Ginio		
GENERAL		
VIL	GN-01	Screen
VIL	GN-02	May Table
VIL	GN-03	Timer
VIL	GN-04	Drying oven
VIL	GN-05	Examination light, mobile
VIL	GN-06	Examination table, obstetric
OPERATION THEATRE		
VIL	OP-01	Operation table
VIL	OP-02	Operation light, mobile
VIL	OP-03	Operation stool
VIL	OP-04	Instrument cabinet
VIL	OP-05	Instrument trolley
VIL	OP-06	Cupboard, drug
ANESTHESIA & RESUSCITATION		
VIL	OP-07	Anesthesia machine
VIL	OP-08	Laryngoscope set, Mackintosh
VIL	OP-09	Oxygen regulator set
VIL	OP-10	Flowmeter oxygen
VIL	OP-11	Nebulizer
VIL	OP-12	Suction pump
VIL	OP-13	Cautery unit
SURGICAL UNIT EQUIPMENT		
VIL	OP-14	Instrument set for major abdominal
VIL	OP-15	Instrument set for minor abdominal
VIL	OP-16	Instrument set for bone
VIL	OP-17	Drying oven
MATERNITY UNIT		
VIL	OG-01	Delivery bed
VIL	OG-02	Instrument set for delivery
VIL	OG-03	Doppler Ultrasound Fetal heart beat detector
GYNECOLOGY AND OBSTETRICS		
VIL	OG-04	Delivery bed
VIL	OG-05	Ultrasound unit
VIL	OG-06	Operation light, mobile
VIL	OG-07	Anesthesia machine
VIL	OG-08	Oxygen flow meter
VIL	OG-09	Operation table
VIL	OG-10	Autoclave
VIL	OG-11	Vacuum extractor
VIL	OG-12	Water bath
VIL	OG-13	Drying oven
VIL	OG-14	Infant incubator
VIL	OG-15	Infant warmer
VIL	OG-16	Suction pump
RADIOLOGY		
VIL	RD-01	X-ray unit, mobile
VIL	RD-02	X-ray film viewer
VIL	RD-03	X-ray film holder
VIL	RD-04	Dark room equipment
DENTAL CLINIC		
VIL	DT-01	Amalgam mixer
VIL	DT-02	X-ray unit, dental
VIL	DT-03	Dental film holder
VIL	DT-04	Operating light, dental mobile
VIL	DT-05	Dental mastoid drill unit
VIL	DT-06	Dental unit
VIL	DT-07	Dental aspirator

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BD No.		BD Description
VIL	DT-08	Autoclave, dental
		OPHTHALMOLOGY
VIL	OT-01	Sight test panel
VIL	OT-02	Slit lamp
VIL	OT-03	Examination chair, ophthalmology
VIL	OT-04	Trial lens, adult
VIL	OT-05	Trial lens, child
VIL	OT-06	Retinoscope
VIL	OT-07	Chart for near vision test
VIL	OT-08	Pen light
VIL	OT-09	Slit microscope
VIL	OT-10	Ophthalmoscope, electrical
VIL	OT-11	Ophthalmoscope, battery
VIL	OT-12	Ophthalmoscope, direct
VIL	OT-13	Ophthalmoscope, indirect
VIL	OT-14	Examination light, mobile
VIL	OT-15	Snellen's chart, E-type
VIL	OT-16	Refractometer
VIL	OT-17	Tonometer
		EMERGENCY OBSTETRIC CARE
VIL	EM-01	Instrument set for caesarean section
VIL	EM-02	Instrument set for obstetric
VIL	EM-03	Resuscitator, for neonate with mask
VIL	EM-04	Resuscitator for adult
VIL	EM-05	Instrument set for vaginal tears
VIL	EM-06	D & C set
		EMERGENCY ROOM
VIL	EM-07	Emergency unit set
VIL	EM-08	Instrument set for cardiology and thoracic
		PHYSIOTHERAPY
VIL	PT-01	Shortwave therapy unit
VIL	PT-02	Muscular stimulator
VIL	PT-03	Infrared lamp
VIL	PT-04	Ultrasound therapy unit
VIL	PT-05	Interferential therapy unit
VIL	PT-06	Exercise mat
VIL	PT-07	Universal foot pump
VIL	PT-08	Traction table
VIL	PT-09	Overhead frame
VIL	PT-10	Duplex pulley weight system for wall
VIL	PT-11	Electro-stimulator
VIL	PT-12	Puch up block set
VIL	PT-13	Parallel bars
VIL	PT-14	Clamp for fitting fixation straps
VIL	PT-15	Chest belt
VIL	PT-16	Hip belt
VIL	PT-17	Neck harness with spreader bar
VIL	PT-18	Physiotherapy unit, mobile
		LABORATORY
VIL	LB-01	Drying oven
VIL	LB-02	Refrigerator
VIL	LB-03	Blood cell counter
VIL	LB-04	Tally counter
VIL	LB-05	Microscope, binocular
VIL	LB-06	Automatic chemistry analyzer
VIL	LB-07	Centrifuge
VIL	LB-08	Haematology analyzer
VIL	LB-09	Shaker
		MISCELLANEOUS

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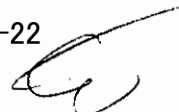


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BD No.		BD Description
VIL	MS-01	Linen cart
VIL	MS-02	Laundry machine
VIL	MS-03	Generator, 150KVA
VIL	MS-04	Solar panel

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A-22



BD No.		BD Description
ADDITIONAL ITEMS FOR FOUR HOSPITALS		
ADD	01	Instruments, theater cesarean section, extras
ADD	02	Instruments, theater gynecology, extras
ADD	03	Instruments, theater tracheotomy, extras
ADD	04	Instruments, theater basic major
ADD	05	Instruments, theater basic minor

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BD No.		BD Description
BEU		For Training
BEU	TR-01	Function Generator
BEU	TR-02	Slidac
BEU	TR-03	Electronic training kit for digital
BEU	TR-04	Technical training, troubleshooting, testing calibrating video Cassettes and bookies concerning medical equipment
BEU	TR-05	BP monitor calibrating means
BEU	TR-06	Digital multimeter with high voltage probe and temperature probe
BEU	TR-07	Electronic components such as for training.(Diodes, Resistors, Inductors, Logic ICs, Capacitors, 7 segment LED displays, micro switches, neon indicator, circuit protector, OP-
BEU	TR-08	Computer with UPS for training exclusively
BEU	TR-09	Printer
BEU	TR-10	Bread board with wires
BEU	TR-11	Hand-held Frequency counter
BEU	TR-12	Frequency counter
BEU	TR-13	Sound level measurement
BEU	TR-14	pH meter
BEU	TR-15	Hand held Digital Oscilloscope
BEU	TR-16	Light Intensity measuring meter in Lux
BEU	TR-17	Flow measuring meter (Digital)
BEU	TR-18	Aneroid Barometer
		For Testing and calibrating
BEU	TC-01	Multi-parameter X-ray meters
BEU	TC-02	Ventilator calibrator
BEU	TC-03	Safety analyzer
BEU	TC-04	ECG simulator
BEU	TC-05	Microprocessor Kit for micro processor programming with AD/DA converter
BEU	TC-06	Defibrillator energy testing analyzer
BEU	TC-07	Oxygen sensing monitor
BEU	TC-08	Laser protective glass
BEU	TC-09	Radiation detector X-ray
BEU	TC-10	IC remover
BEU	TC-11	IC Tester
BEU	TC-12	Low ohm meter
BEU	TC-13	Electrician's tool kit
BEU	TC-14	Electronic service tool
BEU	TC-15	PC service kit
BEU	TC-16	Mechanic's tool kit
		For both repair and training materials
BEU	RT-01	Pressure sensors
BEU	RT-02	Contact tachometer
BEU	RT-03	Optical tachometer
BEU	RT-04	Stethoscope for machine inspection
BEU	RT-05	Set of different size of extension and compression spring kits
BEU	RT-06	Set of fiber washing kit
BEU	RT-07	Vaseline grease for high voltage in X-ray unit
BEU	RT-08	Micro tech tool set
BEU	RT-09	L shaped Torx drivers sets,
BEU	RT-10	Three stage hot air gun
BEU	RT-11	Service engineer's vacuum cleaners
BEU	RT-12	Socket wrench set
BEU	RT-13	Bench magnifiers with light
BEU	RT-14	"O" ring kit mixed sizes
BEU	RT-15	Contact treatment
BEU	RT-16	High temperature grease
BEU	RT-17	Silicone grease
BEU	RT-18	Altimeter
BEU	RT-19	Scientific calculator

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BD No.		BD Description
BEU	RT-20	Magnetic screw driver kit long handle
BEU	RT-21	Precision soldering iron with fine tips
BEU	RT-22	D.C. power supply
BEU	RT-23	Variable current sources
		For Tools and Instruments from the Section in the MEU Workshop
		Tool
BEU	TL-01	Battery charger (12V, 24V), variable current
BEU	TL-02	Hydrometer
BEU	TL-03	Oscilloscope 100Mhz
BEU	TL-04	Antistatic pad with strap
		For Various Section
BEU	MS-01	Digital multimeter
BEU	MS-02	Digital clamp meter
BEU	MS-03	Soldering iron of heavy duty 250W
BEU	MS-04	Soldering iron of 40W
BEU	MS-05	Soldering iron of 60W
BEU	MS-06	Soldering iron of 100W
BEU	MS-07	Soldering gun of different range 20-130W
BEU	MS-08	Sucker
BEU	MS-09	Gas leak detector for anesthesia machine
		For wood work
BEU	WD-01	Wood work tool sets (Electric drill, Glass cutter, Files sets, Chisels sets, Saw, Planner)
		For plumber
BEU	PL-01	Plumber tool sets (Thread cutter, Mason chisel, Iron chisels, Hack saw, Files sets, Pipe wrench)

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دولة ارتريا
وزارة الصحة

The State of Eritrea
MINISTRY OF HEALTH

Date : 26/01/07

Ref.No: 15144/668/07

Application for Japan Government's Grant Aid

Applicant: Government of State of Eritrea

Project Title: Upgrading Regional Hospitals Medical Equipment

Sector: Health Sector

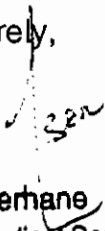
Project Type: Procurement and Supply of Medical Equipment

Subject: Villagio Ginio Community Hospital

The Division of Medical Services in the ministry of health and the Human Resources planning and Management Division together reaffirm their commitment and assurances in staffing the above mentioned hospital based on the requested number and categories of medical personnel and administrative staff by the Zonal medical Office of Maekel Zone and above which satisfies the standard norm of a community or district hospital in the process of equipping the hospital with the required and necessary medical equipments. In addition senior experienced hospital management team members will be elected so that to work on the hospital commissioning plan.

Sincerely,

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Dr. Bernane Debru
Director of Medical Services Division

☎/Tel. 120297
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Personnel Required for Villagio Ginio Hospital

Type of Personnel	Needed Staff
GMPs (Physicians)	5 one medical director
General surgeon	1
Matron	1
Head Nurses	7
Staff nurses	24
Health assistants	42
Lab Technicians	6
Pharmacy technicians	5
Dental Technician	3
X-ray technicians	2
Administrative Staff	
Admnistrator	1
Personnel	1
Finance Officer	1
Accountant	1
Purchaser	1
General Service	4 One electrician
Plumber	1
Cash collectors	6
Statistical clerk	1
Card men	6
Typist(computer specialist)	1
Operators	4
Cleaner	50
Guards	8
Laundry women+ ironing	10
Drivers	4
Kitchen workers	12
Gardner	2
Tailor	1

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Appendices-5 Minutes of Discussions (Draft Report Explanation)

**MINUTES OF DISCUSSIONS
OF THE BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF
COMMUNITY HEALTH SERVICE
IN THE STATE OF ERITREA
(EXPLANATION OF THE DRAFT REPORT)**

In January and February 2007, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Improvement of Community Health Service (hereinafter referred to as "the Project") to the State of Eritrea (hereinafter referred to as "Eritrea"), and through discussions, field surveys, and technical examination of the results in Japan, JICA prepared the draft report of the study.

In order to explain and to consult the Government of Eritrea on the components of the draft report, JICA sent to Eritrea the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Dr. Yujiro Handa, Project Formulation Advisor, JICA Regional Support Office for Eastern and Southern Africa, JICA, from May 16 to 26.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Asmara, May 25, 2007



Dr. Yujiro HANDA
Leader
Draft Report Explanation Team
Japan International Cooperation Agency
Japan



Mr. Saleh Meky
Minister
Ministry of Health
The State of Eritrea



Mr. Berhane Abrehe
Minister
Ministry of Finance
The State of Eritrea

ATTACHMENT

1. Components of the Draft Report

The Government of Eritrea agreed upon and accepted in principle the components of the draft report and the soft component plan explained by the Team.

2. Japan's Grant Aid Scheme

The Government of Eritrea understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Eritrea as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions on the Preliminary Study signed by both parties on August 9, 2006.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send the report to the Government of Eritrea by August 2007.

4. Confidentiality of the Project

Both sides confirmed that all information related to the Project including detailed specifications of the equipment and other technical information shall not be released to any outside party before the signing of all the Contract(s) for the Project.

5. Other relevant issues

5-1. Confidentiality of the Project Cost Estimation

The Team explained the cost estimation of the Project as described in Annex-1. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties before signing of all the Contract(s) for the Project. Eritrean side understood that the Project Cost Estimation attached as Annex-1 is not final and is subject to change.

5-2. Operation and Maintenance of Equipment

The Government of Eritrea promised to secure and allocate necessary budget as mentioned in Annex-2 for the proper and sustainable operation and maintenance of the equipment to be procured under the Project.

5-3. Undertakings by the Eritrean Side

The Government of Eritrea promised to take every necessary measure to conduct the undertakings according to the tentative schedule mentioned in Annex-3.

5-4. Staff Allocation

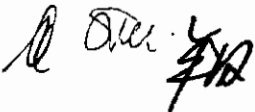
The Government of Eritrea promised to secure and assign necessary staff to the targeted hospitals of the Project and to the Biomedical Engineering Unit. Especially for the Villagio Ginio Hospital, the Government of Eritrea promised to assign necessary staff according to the plan described in Annex-4 before the procurement of equipment under the Project.

5-5. Issues on Medical Waste

The Team once again explained their concerns on environmental issues related to the Project

sites, such as how medical liquid waste is currently being discharged to the general drainage and how medical waste and general waste are being incinerated without distinction. The Government of Eritrea promised to take necessary measures on those environmental issues.

【End】



Operation and Maintenance Cost for the Equipment

This equipment project, if implemented, will require the following expenses (per annum) for procurement of the spare parts, consumables and fuel.

Table. Maintenance Cost of Equipment per year

	Halibet	Agordat	Massawa	Villagio Ginio	BEU	Total (Nakfa)
Medical Equipment	1,123,283	406,792	333,148	530,244		2,393,467
Non-Medical Equipment					61,794	61,794
Fuel				294,840		294,840
Total						2,750,101

Tentative Schedule of the Project

The sequence of works, shown in the table below, will be followed by the Project after the exchange of notes between the Government of Eritrea and the Government of Japan.

	Number of Month															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
● Japan																
Exchange of Notes	●															
Consultant Agreement	○															
Detail Design		■														
Tender related work				■												
Equipment ordering, manufacturing						■										
Equipment transportation								■								
Unloading, unpacking, installation of equipment												■				
Medical equipment management training and exercise (Soft components)													■			
● Eritrea																
Re-wiring of Agordat hospital														■		
Construction of new OR building and X-ray building at Villagio Ginio Hospital																

Handwritten signatures and initials.

**Staff Allocation Plan Submitted for Villagio Ginio Hospital
Submitted by MOH**

Personnel Required for Villagio Ginio Hospital

Type of Personnel	Needed Staff
GMPs (Physicians)	5 one medical director
General surgeon	1
Matron	1
Head Nurses	7
Staff nurses	24
Health assistants	42
Lab Technicians	6
Pharmacy technicians	5
Dental Technician	3
X-ray technicians	2
Administrative Staff	
Admnistrator	1
Personnel	1
Finance Officer	1
Accountant	1
Purchaser	1
General Service	4 One electrician
Plumber	1
Cash collectors	6
Statistical clerk	1
Card men	6
Typist(computer specialist)	1
Operators	4
Cleaner	50
Guards	8
Laundry women+ ironing	10
Drivers	4
Kitchen workers	12
Gardner	2
Tailor	1

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Appendices-6 Examination of Requested Equipment

Examination of the Requested Equipment

Appendices-6

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Op. Cost	Judgment	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
Halibet	OPERATION THEATER												OPERATION THEATER	
HAL OP-01	Echocardiogram unit	New	x	x					x				Defibrillator	Not necessary in the OR, planned in Ultrasound room
HAL OP-02	ECG	New		x					x			A-016	Existing second hand machine to be renewed	Function overlapping with Patient monitor
HAL OP-03	Defibrillator with ECG monitor	Rep								1	HAL OP-01	A-016	IBP, SPO2, CO2 to be included	
HAL OP-04	Patient monitor with oxymeter	Ren						x	x		HAL OP-02	A-081	Maintenance and regent cost is huge	Requested as syringe pump, have never used before
HAL OP-05	Blood gas analyzer	New			x				x				Suction pump	1 in General and Maxillo facial
HAL OP-06	Per fusers	New								2	HAL OP-03	A-099	A complete set for upper digestive organs, basic specs	
HAL OP-07	Suction pump	Rep								1	HAL OP-04	A-031	To be included in endoscope set	
HAL OP-08	Endoscope	Ren								1	HAL OP-05	A-030	To be included in endoscope set	
HAL OP-09	Colonoscope	Ren											To be included in endoscope set	
HAL OP-10	Rectoscope	New		x					x				To be included in endoscope set	
HAL OP-11	Sigmoidoscope	New		x					x				To be included in endoscope set	
HAL OP-12	Endoscope video system	Ren		x					x				To be included in endoscope set	
HAL OP-13	Monitor for gastro-intestinal	Ren		x					x				To be included in endoscope set	
HAL OP-14	Patient monitor	Ren								2	HAL OP-06	A-082	One in each OR	
HAL OP-15	Anesthesia tables	Rep								5	HAL OP-07	A-005	To be replaced with existing 3 machines	
HAL OP-16	Anesthesia machine	Rep								3	HAL OP-08	A-003	To be replaced with existing 3 machines	
HAL OP-17	Operation light, mobile	Rep								3	HAL OP-09	A-069	To be replaced with existing 3 machines	
HAL OP-18	Cautery unit	Rep								6	HAL OP-10	A-012	To be used in 6 ORs except for Burn room	
HAL OP-19	Autoclave	Ren								2	HAL OP-11	A-008	Vertical type for easy installation	
HAL OP-20	X-ray unit, C-arm	Ren		x					x				Already equipped	
HAL OP-21	Drill, electrical	New								1	HAL OP-12	A-024	To be supplied in Orthopedic Room	
HAL OP-22	Doppler machine	New								1	HAL OP-13	A-022	For detection of blood circulation of diabetes patients	
HAL OP-23	Stretcher	Rep								4	HAL OP-14	A-098	One in Major OR, 1 stretcher for other 2 ORs	
HAL OP-24	Operation table	Rep								2	HAL OP-15	A-072	To be replaced with 2 old existing machines	
										1	HAL OP-16	A-032	Transferred from EN-02	
										1	HAL OP-17	A-028	Transferred from BN-01	
										2	HAL OP-18	A-073	Transferred from OR-01	
										2	HAL OP-19	A-055	Transferred from EIM-04	
	IMAGING DIAGNOSIS AND RADIOLOGY												IMAGING DIAGNOSIS AND RADIOLOGY	
HAL RD-01	X-ray unit, general	Rep								1	HAL RD-01	A-117	Mobile type to be planned for future relocation	
HAL RD-02	Ultrasound unit	Ren								1	HAL RD-02	A-107	To be replaced with the old existing machine	
										1	HAL RD-03	A-009	104 films used daily (2006)	
										1	HAL RD-04	A-118	Intended to use X-ray apparatus safely	
	LABORATORY												LABORATORY	
HAL LB-01	Centrifuge	Ren								3	HAL LB-01	A-013	One in Haematology, Serology and Bacteriology room	
HAL LB-02	Drying oven	Rep								2	HAL LB-02	A-026	1 in Bacteriology, 1 in Microbiology room	
HAL LB-03	Distiller	New								1	HAL LB-03	A-021	Used to wash instrument or to adjust reagents	
HAL LB-04	Refrigerator	Ren								3	HAL LB-04	A-025	One in Urology, Bacteriology and Microbiology room	
HAL LB-05	Microscope, binocular	Ren								3	HAL LB-05	A-067	One in Urology, Bacteriology and Microbiology room	
HAL LB-06	ELISA machine	New						x	x				Requested as biochemical analyzer, too much maintenance cost	
HAL LB-07	Blood cell counter	Ren								2	HAL LB-06	A-010	1 in Haematology, 1 in Serology	
HAL LB-08	Haematology analyzer	Ren						x	x				Existing item can still be used	
	ENT												ENT	
HAL EN-01	Microscope, ENT	Ren		x					x				Already equipped	
HAL EN-02	Telescope set	New											Transferred to OR, OP-16	
HAL EN-03	Examination light, mobile	Ren								1	HAL EN-01	A-074	Requested as loupe for ENT	
HAL EN-04	Instrument set for nasal and plastic	Ren								1	HAL EN-02	A-100	Transferred to OR, OP-19	
HAL EN-05	Retinoscope	New											Suction pump, small	Requested as suction pump, to be used in OPD
	BURN												BURN	
HAL BN-01	Electrical dermatomes	Ren											Transferred to OR, OP-17	
HAL BN-02	Patient monitor	Ren		x					x				Already equipped	

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Op. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
HAL BN-03	Per fusers	New			x				x					Have never been used before
HAL BN-04	Blood gas and electrolyte analyser	New						x	x					Maintenance and reagent cost is huge
	ORTHOPEDIC													
HAL OR-01	Operation table	Ren												Transferred to OR, OP-18
HAL OR-02	Saw, electrical	Ren	x						x					Overlapped with OP-12
HAL OR-03	Gypsum cutter	Ren								1	HAL OR-01	A-052	Instrument set for gypsum	To be replaced with the old existing machine
	DENTAL													
HAL DT-01	Dental unit	Ren					x		x					Re-installation will be difficult after relocation of hospital
HAL DT-02	Instrument set for dental	Ren	x						x					Already equipped
HAL DT-03	Dental scaler	Rep								1	HAL DT-01	A-019	Dental scaler	To be replaced with old existing machine
	MISCELLANEOUS													
HAL MS-01	Solar panel	New	x						x					Not appropriate for hospital equipment
HAL MS-02	Generator, 150KVA	Ren					x		x					Re-installation will be difficult after relocation of hospital
	DIABETES THERAPY													
HAL DI-01	Vascular doppler for diabetes patients	New								1	HAL DI-01	A-022	Doppler machine	For detection of blood circulation of diabetes patients
HAL DI-02	Pulse oxymeter	New								1	HAL DI-02	A-088	Pulse oxymeter	For detection of SPO2 for diabetes patients
HAL DI-03	Slit lamp with tonometer	New				x			x					There is no ophthalmology doctor
HAL DI-04	Physiotherapy equipment set	New												Included in DI-05 and after
HAL DI-05	Exercise bike	New							x	1	HAL DI-03	A-037	Exercise bike	To be installed in Physiotherapy room
HAL DI-06	Traction pulley	New							x	1	HAL DI-04	A-103	Traction pulley	To be installed in Physiotherapy room
HAL DI-07	Puch up block set	New								1	HAL DI-05	A-038	Exercise mat	Existing item can still be used
HAL DI-08	Exercise mat	New							x					To be installed in Physiotherapy room
HAL DI-09	Medicine ball set	New		x					x					Existing item can still be used
HAL DI-10	Walk exercise block	New		x					x					Existing item can still be used
HAL DI-11	Parallel bars	New		x					x					Existing item can still be used
	ADDITIONAL ITEMS FOR FOUR HOSPITALS													
HAL AD-01	Instruments, theater cesarean section, extras	New	x			x			x					There is no Delivery department
HAL AD-02	Instruments, theater gynecology, extras	New	x			x			x					There is no Delivery department
HAL AD-03	Instruments, theater tracheotomy, extras	New								2	HAL AD-01	A-060	Instruments, theater tracheotomy, extras	2 sets including a spare for sterilization
HAL AD-04	Instruments, theater basic major	New								2	HAL AD-02	A-053	Instrument set for major abdominal	2 sets including a spare for sterilization
HAL AD-05	Instruments, theater basic minor	New								2	HAL AD-03	A-054	Instrument set for minor abdominal	2 sets including a spare for sterilization
	Agordat													
	OPERATION THEATER													
AGO OP-01	Operation table	Ren								2	AGO OP-01	A-072	Operation table	Many equipment in both Ors are old
AGO OP-02	Operation light, mobile	Ren								2	AGO OP-02	A-069	Operation light, mobile	Many equipment in both Ors are old
AGO OP-03	Operation stool	Ren								2	AGO OP-03	A-071	Operation stool	Many equipment in both Ors are old
AGO OP-04	Instrument cabinet	Ren								2	AGO OP-04	A-047	Instrument cabinet	One in each OR
AGO OP-05	Instrument trolley	Ren								2	AGO OP-05	A-058	Instrument trolley	One in each OR
AGO OP-06	Cupboard, drug	Ren								2	AGO OP-06	A-014	Cupboard, drug	One in each OR
AGO OP-07	Suction pump	Ren								2	AGO OP-07	A-099	Suction pump	One in each OR
AGO OP-08	ECG	New		x					x					Function overlapping with Patient monitor
AGO OP-09	Anesthesia machine	Rep								1	AGO OP-08	A-004	Anesthesia machine, B	1 in Minor OR
AGO OP-10	Laryngoscope set	Ren								2	AGO OP-09	A-062	Laryngoscope set, Mackintosh	One in each OR
AGO OP-11	Oxygen regulator set	Ren								1	AGO OP-10	A-079	Oxygen regulator set	1 in Minor OR
AGO OP-12	Flowmeter Oxygen	Ren		x					x					Included in OP-11
AGO OP-13	Nebulizer	New		x					x					Included in OP-11
AGO OP-14	Suction pump	Ren		x					x					Overlapped with OP-07
AGO OP-15	Cautery unit	Ren		x					x	1	AGO OP-11	A-012	Cautery unit	One in Minor OR should be replaced
		Ren								1	AGO OP-12	A-081	Patient monitor, A	Transferred from EM-19
		New								1	AGO OP-13	A-046	Infusion pump	Transferred from EM-24
		New								1	AGO OP-14	A-070	Operation microscope	Transferred from TO-09
	EMERGENCY DEPARTMENT													
AGO EM-01	Examination table	Ren								2	AGO EM-01	A-035	Examination table	Basic item
AGO EM-02	Sphygmomanometer	Ren								2	AGO EM-02	A-096	Sphygmomanometer	Basic item

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Opex. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
AGO PT-09	Traction table	Ren							x					Included in PT-09
AGO PT-10	Overhead frame	New							x					Included in PT-09
AGO PT-11	Duplex pulley weight system for wal	New							x					Included in PT-09
AGO PT-12	Electro-stimulator	New							x					Overlapped with PT-03
AGO PT-13	Puch up block set	New							x					Used for assist for puch up
AGO PT-14	Parallel bars	Ren							x					Already equipped
AGO PT-15	Clamp for fitting fixation straps	New							x					Included in PT-09
AGO PT-16	Chest belt	New							x					Included in PT-09
AGO PT-17	Hip belt	New							x					Included in PT-09
AGO PT-18	Neck harness	New							x					Included in PT-09
AGO PT-19	Weight set	New							x					Included in PT-09
AGO		New												For aerobic exercise
AGO		New												For training of shoulder, upper arm movement
AGO		New												For walk exercise, aerobic exercise
AGO		New												For sedentary stretching or flexible exercise
	GYNECOLOGY AND OBSTETRICS													
AGO OG-01	Delivery bed	Ren												To be replaced with 2 old existing machines
AGO OG-02	Ultrasound unit. B/W	New												Basic equipment for detection of embryo conditions
AGO OG-03	Operation light, mobile	Ren												To be replaced with 2 old existing machines
AGO OG-04	Anesthesia machine	New	x						x					There are no OR room for OB/GN Dep.
AGO OG-05	Oxygen flowmeter	New	x						x					There are no OR room for OB/GN Dep.
AGO OG-06	Operation table	New	x						x					There are no OR room for OB/GN Dep.
AGO OG-07	Autoclave	New												The existing one became too old
AGO OG-08	Vacuum extractor	New												Planned for safer delivery
AGO OG-09	Water bath	Ren	x						x					Request not clearly confirmed
AGO OG-10	Drying oven	Ren												The existing one became too old
AGO OG-11	Infant incubator	New												For protection of immature infants
AGO OG-12	Infant warmer	New												For protection of immature infants
AGO OG-13	Suction pump	New												Basic item
	DENTAL EQUIPMENT													
AGO DT-01	Amalgam mixer	New												A must equipment for cavity treatment
AGO DT-02	X-ray unit, dental	Ren												A must diagnostic equipment in dental room
AGO DT-03	Dental film holder	New							x					Included in DT-02
AGO DT-04	Examination light, mobile	Ren							x					Included in DT-06
AGO DT-05	Dental mastoid drill unit complete	Ren												2 sets including a spare for sterilization
AGO DT-06	Dental unit	Ren												Existing machine is too old to use
AGO DT-07	Dental aspirator	Ren												Included in DT-06
AGO DT-08	Autoclave, dental	Ren							x					To be replaced with the old existing machine
		New												Newly added to the list, necessary item for dental room
	OPHTHALMIC EQUIPMENT													
AGO OT-01	Sight test panel	New	x											Request not clearly confirmed
AGO OT-02	Slit lamp	New							x					To be combined with Tonometer
AGO OT-03	Examination chair, eye	New												Basic items with simple and minimum specs
AGO OT-04	Trial lens, adult	New												Necessary for prescription of glasses
AGO OT-05	Trial lens, child	New												Necessary for prescription of glasses
AGO OT-06	Retinoscope	New												Necessary for diagnosis of cataract
AGO OT-07	Refractometer	New												For accurate measurement of shortsight or astigma
AGO OT-08	Tonometer	New							x					Included in OT-02
AGO OT-09	Operation microscope	New												Transferred to OR, OP-13
AGO OT-10	Pen light	New												Basic item
AGO OT-11	Ophthalmoscope, electrical	New												A must diagnostic equipment in dental room
AGO OT-12	Ophthalmoscope, battery	New												A must diagnostic equipment in dental room
AGO OT-13	Ophthalmoscope, direct	New	x						x					Overlapped with OT-11
AGO OT-14	Ophthalmoscope, indirect	New												For diagnosis of peripheral part of eye ball

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Op. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
AGO OT-15	Examination light, mobile	New								1	AGO OT-11	A-034	Examination light, mobile	Basic item
AGO OT-16	Chart for near vision test	New	x	x					x				Overlapped with OT-11	
AGO OT-17	Snellen's chart, E-type	New								1	AGO OT-11	A-095	Snellen's chart, E-type	For screening, Snellen type
AGO MS-01	MISCELLANEOUS Laundry machine	New		x		x			x					Existing equipment still working
AGO MS-02	Solar panel	New	x						x					Not effective as a source of power supply, hospital should be supplied with power for 24 hours
AGO AD-01	ADDITIONAL ITEMS FOR FOUR HOSPITALS Instruments, theater cesarean section, extras	New								2	AGO AD-01	A-049	Instrument set for caesarean section	2 sets including a spare for sterilization
AGO AD-02	Instruments, theater gynecology, extras	New								2	AGO AD-02	A-059	Instruments, theater gynecology, extras	2 sets including a spare for sterilization
AGO AD-03	Instruments, theater tracheotomy, extras	New								2	AGO AD-03	A-060	Instruments, theater tracheotomy, extras	2 sets including a spare for sterilization
AGO AD-04	Instruments, theater basic major	New								2	AGO AD-04	A-053	Instrument set for major abdominal	2 sets including a spare for sterilization
AGO AD-05	Instruments, theater basic minor	New								2	AGO AD-05	A-054	Instrument set for minor abdominal	2 sets including a spare for sterilization
MAS	OPERATION THEATER													
MAS OP-01	Operation light, mobile	Rep								2	MAS OP-01	A-069	Operation light, mobile	One in each OR
MAS OP-02	Operation table	Rep								2	MAS OP-02	A-072	Operation table	One in each OR
MAS OP-03	ECG	New	x						x					Have never been used before
MAS OP-04	Defibrillator	New								1	MAS OP-03	A-016	Defibrillator	Necessary item for OR
MAS OP-05	Pulse oxymeter	New								2	MAS OP-04	A-088	Pulse oxymeter	Used with anaesthetic machine, for monitoring of SPO2
MAS OP-06	Oxygen concentrator	Ren							x					Already equipped
MAS OP-07	Suction pump	Rep		x						2	MAS OP-05	A-099	Suction pump	One in each OR
MAS OP-08	Vacuum extractor	New								1	MAS OP-06	A-109	Vacuum extractor	Planned for safer delivery
MAS OP-09	Cautery unit	Ren								2	MAS OP-07	A-012	Cautery unit	One in each OR
MAS		Ren								2	MAS OP-08	A-008	Autoclave, vertical	Transferred from MS-05, vertical type for easy installation
MAS		New								2	MAS OP-09	A-043	Infant incubator	Transferred from MS-03
		New								1	MAS OP-10	A-081	Patient monitor, A	Transferred from EM-19
MAS	EMERGENCY DEPARTMENT													
MAS EM-01	Examination table	Ren								2	MAS EM-01	A-035	Examination table	Basic item
MAS EM-02	Stretcher	New								1	MAS EM-02	A-098	Stretcher	Basic item
MAS EM-03	Wheel chair, foldable	New								2	MAS EM-03	A-111	Wheel chair, foldable	Basic item
MAS EM-04	Instrument cabinet	Ren								1	MAS EM-04	A-047	Instrument cabinet	Basic item
MAS EM-05	Instrument trolley	Ren								1	MAS EM-05	A-058	Instrument trolley	Basic item
MAS EM-06	Boiling sterilizer	New								1	MAS EM-06	A-007	Autoclave, small	Autoclave, small type to be supplied
MAS EM-07	Ophthalmoscope, battery	New								1	MAS EM-07	A-076	Ophthalmoscope, battery	A must diagnostic equipment in dental room
MAS EM-08	Instrument trolley	Ren								1	MAS EM-08	A-057	Instrument table	Basic item
MAS EM-09	I.V. stand	Ren								1	MAS EM-09	A-042	I.V. stand	A must equipment in ER
MAS EM-10	Cautery unit	New	x	x					x					No operation room in ER
MAS EM-11	Plaster bandage table	New								1	MAS EM-10	A-086	Plaster bandage table	For surgical emergency patients
MAS EM-12	Gypsum cutter, electrical	New								1	MAS EM-11	A-041	Gypsum cutter, electrical	For surgical emergency patients
MAS EM-13	Suction pump	Ren								1	MAS EM-12	A-099	Suction pump	To be replaced with the old existing machine
MAS EM-14	Ambu bag set	New								1	MAS EM-13	A-002	Ambu bag set	A must item for resuscitation in ER
MAS EM-15	Instrument set for gypsum	New								1	MAS EM-14	A-052	Instrument set for gypsum	For surgical emergency patients
MAS EM-16	Stretcher	New												Overlapped with EM-02
MAS EM-17	Patient monitor	New		x					x					Not necessary in ER, Transferred to OR, OP-10
MAS EM-18	Defibrillator	New								1	MAS EM-15	A-016	Defibrillator	A must equipment in ER
MAS EM-19	Emergency cart	New								1	MAS EM-16	A-029	Emergency cart	A must item for ER
MAS EM-20	Pulse oxymeter	New								1	MAS EM-17	A-088	Pulse oxymeter	For monitoring of SPO2 of emergency patients
MAS EM-21	Examination light, mobile	Ren								1	MAS EM-18	A-034	Examination light, mobile	Basic item
MAS EM-22	Infusion pump	Ren								1	MAS EM-19	A-046	Infusion pump	Used to supplement water, sugar, blood components
MAS EM-23	Bowl stand	New								1	MAS EM-20	A-011	Bowl stand	Basic item
MAS EM-24	Defibrillator	New		x					x					Overlapped with EM-15
MAS EM-25	Patient monitor	New		x					x					Overlapped with OP-10
MAS EM-26	ECG, 3 channel	New								1	MAS EM-21	A-027	ECG	A must item for detecting the heart conditions

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Op. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
MAS EM-27	Lung function tester	New	x	x	x				x	1	MAS EM-22	A-064	Lung function tester	Necessary for diagnosis of asthma or bronchial disorder
MAS EM-28	Oxygen concentrator	New												Already equipped in OR
	IMAGING DIAGNOSIS													
MAS RD-01	X-ray unit, general	Ren					x		x	1	MAS RD-01	A-117	X-ray unit, mobile	Re-installation will be difficult after relocation of hospital
MAS RD-02	X-ray unit, mobile	Ren								1	MAS RD-02	A-114	X-ray processing tank	Mobile type to be planned for future relocation
MAS RD-03	Automatic developer	Ren								1	MAS RD-03	A-108	Ultrasound unit, B/W	To be supplied as manual type treatment tank
MAS RD-04	Ultrasound unit, B/W	New								1	MAS RD-04	A-023	Doppler Ultrasound Fetal heart beat detector	Basic equipment for detection of embryo conditions
MAS RD-05	Doppler Ultrasound Fetal heart beat detector	New								1	MAS RD-05	A-118	X-ray protective set	Basic equipment for detection of embryo conditions
MAS RD-06	Sigmoidscope	New								1	MAS RD-06	A-118	X-ray protective set	Have never been used before
	LABORATORY													Intended to use X-ray apparatus safely
MAS LB-01	Microscope, binocular	Ren		x					x					Already equipped
MAS LB-02	Haematology analyzer	New						x						Maintenance and regent cost is huge
MAS LB-03	Centrifuge	Rep								1	MAS LB-01	A-013	Centrifuge	To be used in OPD labo
MAS LB-04	Shaker	Rep								1	MAS LB-02	A-092	Shaker	To be used in Main labo
MAS LB-05	Drying oven	Ren		x					x					Already equipped
MAS		Ren								1	MAS LB-03	A-025	Drug refrigerator	Transferred from MS-04
	OPHTHALMIC SECTION													
MAS OT-01	Operation microscope	Ren		x					x					Already equipped
MAS OT-02	Slit lamp	Ren		x					x					Already equipped
MAS OT-03	Examination chair, ophthalmology	New								1	MAS OT-01	A-033	Examination chair, ophthalmology	Basic items with simple and minimum specs
MAS OT-04	Trial lens, adult	Ren		x					x					Already equipped
MAS OT-05	Trial lens, child	Ren		x					x					Already equipped
MAS OT-06	Retinoscope	New								1	MAS OT-02	A-090	Retinoscope	Necessary for diagnosis of cataract
MAS OT-07	Refractometer	New								1	MAS OT-03	A-089	Refractometer	For accurate measurement of shortsight or astigma
MAS OT-08	Tonometer	New		x					x					Already equipped
MAS OT-09	Keratometer	New		x					x					Have never been used before
MAS OT-10	Lensmeter	New		x					x					Have never been used before
MAS OT-11	Fundus camera	New		x					x					Overlapped function with OT-02
MAS OT-12	Ophthalmic loupe	Ren								1	MAS OT-04	A-075	Ophthalmic loupe	Basic diagnostic item for ophthalmology
MAS OT-13	Pen light	New								1	MAS OT-05	A-084	Pen light	Basic item
MAS OT-14	Slit microscope	Ren		x					x					Already equipped
MAS OT-15	Ophthalmoscope, electrical	New								1	MAS OT-06	A-077	Ophthalmoscope, electrical	A must diagnostic equipment in dental room
MAS OT-16	Ophthalmoscope, battery	New								1	MAS OT-07	A-076	Ophthalmoscope, battery	A must diagnostic equipment in dental room
MAS OT-17	Ophthalmoscope, direct	New		x					x					Overlapped with OT-06
MAS OT-18	Ophthalmoscope, indirect	New								1	MAS OT-08	A-078	Ophthalmoscope, indirect	For diagnosis of peripheral part of eye ball
MAS OT-19	Examination light, mobile	New								1	MAS OT-09	A-034	Examination light, mobile	Basic item
MAS OT-20	Snellen's chart, E-type	New								1	MAS OT-10	A-095	Snellen's chart, E-type	For screening, Shellen type
	DENTAL UNIT													
MAS DT-01	Amalgam mixer	New								1	MAS DT-01	A-001	Amalgam mixer	A must equipment for cavity treatment
MAS DT-02	X-ray unit, dental	New								1	MAS DT-02	A-116	X-ray unit, dental	A must diagnostic equipment in dental room
MAS DT-03	Dental film holder	New							x					Included in DT-02
MAS DT-04	Operation light, dental	Ren								1	MAS DT-03	A-034	Examination light, mobile	Basic item
MAS DT-05	Dental mastoid drill unit complete	Ren								2	MAS DT-04	A-018	Dental mastoid drill unit	2 sets including a spare for sterilization
MAS DT-06	Dental unit	Ren							x					Re-installation will be difficult after relocation of hospital
MAS DT-07	Dental aspirator	New								1	MAS DT-05	A-100	Suction pump, small	Small dental type
	FIXED HOSPITAL EQUIPMENT AND									1	MAS DT-06	A-039	Film developer, dental	Newly added to the list, necessary item for dental room
MAS MS-01	Generator, 150KVA	Ren							x					Re-installation will be difficult after relocation of hospital
MAS MS-02	Solar panel	New	x						x					Not effective as a source of power supply, hospital should be supplied with power for 24 hours
MAS MS-03	Infant incubator	New												Transferred to OR, OP-09
MAS MS-04	Refrigerator	Ren												Transferred to LB-03
MAS MS-05	Autoclave, dental	Ren												Request for Steam sterilizer, Transferred to OR, OP-08

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Op. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
MAS AD-01	ADDITIONAL ITEMS FOR FOUR HOSPITALS	New								2	MAS AD-01	A-049	ADDITIONAL ITEMS FOR FOUR Instrument set for caesarean section	2 sets including a spare for sterilization There is no Delivery department
MAS AD-02	Instruments, theater gynecology, extras	New	x						x					
MAS AD-03	Instruments, theater gynecology, extras	New		x						2	MAS AD-02	A-060	Instruments, theater tracheotomy, extras	2 sets including a spare for sterilization
MAS AD-04	Instruments, theater basic major	New								2	MAS AD-03	A-053	Instrument set for major abdominal	2 sets including a spare for sterilization
MAS AD-05	Instruments, theater basic minor	New								2	MAS AD-04	A-054	Instrument set for minor abdominal	2 sets including a spare for sterilization
Vilagio Ginio														
VIL GN-01	GENERAL	Rep								5	VIL GN-01	A-091	GENERAL Screen	1 for Delivery, 1 for ER, 3 for OPD
VIL GN-02	May table	New								5	VIL GN-02	A-058	Instrument trolley	1 in Delivery, 1 in ER, 3 in OPD, as Instrument trolley Transferred to Labo, LB-08
VIL GN-03	Timer	New												
VIL GN-04	Drying oven	New								2	VIL GN-03	A-026	Drying oven	1 for Delivery, 1 for ER
VIL GN-05	Examination light, mobile	New								5	VIL GN-04	A-034	Examination light, mobile	1 for Delivery, 1 for ER, 3 for OPD
VIL GN-06	Examination table, obstetric	New								2	VIL GN-05	A-036	Examination table, OB/GN	1 for Delivery, 1 for OPD
VIL OP-01	OPERATION THEATRE													
VIL OP-02	Operation table	New								2	VIL OP-01	A-072	Operation table	Used in the 2 new OR
VIL OP-03	Operation light, mobile	New								2	VIL OP-02	A-069	Operation light, mobile	2 doctors will be staffed
VIL OP-04	Operation stool	New								2	VIL OP-03	A-071	Operation stool	2 doctors will be staffed
VIL OP-05	Instrument cabinet	New								2	VIL OP-04	A-047	Instrument cabinet	Used in the 2 new OR
VIL OP-06	Instrument trolley	New								2	VIL OP-05	A-058	Instrument trolley	Used in the 2 new OR
VIL OP-07	Cupboard, drug	New								2	VIL OP-06	A-014	Cupboard, drug	Used in the 2 new OR
VIL OP-08	ANESTHESIA & RESUSCITATION													
VIL OP-09	Anesthesia machine	New								2	VIL OP-07	A-004	Anesthesia machine, B	2 doctors will be staffed
VIL OP-10	Laryngoscope set, Mackintosh	New								2	VIL OP-08	A-062	Laryngoscope set, Mackintosh	2 doctors will be staffed
VIL OP-11	Oxygen regulator set	New								2	VIL OP-09	A-079	Oxygen regulator set	2 doctors will be staffed
VIL OP-12	Flowmeter oxygen	New												
VIL OP-13	Nebulizer	New												
VIL OP-14	Suction pump	New								2	VIL OP-10	A-099	Suction pump	Included in OP-09
VIL OP-15	Cautery unit	New								2	VIL OP-11	A-012	Cautery unit	Used in the 2 new OR
VIL OP-16	SURGICAL UNIT EQUIPMENT													
VIL OP-17	Instrument set for major abdominal	New								2	VIL OP-12	A-053	Instrument set for major abdominal	2 doctors will be staffed
VIL OP-18	Instrument set for minor abdominal	New								2	VIL OP-13	A-054	Instrument set for minor abdominal	2 doctors will be staffed
VIL OP-19	Instrument set for bone	New								2	VIL OP-14	A-048	Instrument set for bone	2 sets including a spare for sterilization
VIL OP-20	Drying oven	New								2	VIL OP-15	A-026	Drying oven	Used in the 2 new OR
VIL OG-01	MATERNITY UNIT													
VIL OG-02	Delivery bed	New	x											
VIL OG-03	Instrument set for delivery	New												
VIL OG-04	Doppler Ultrasound Fetal heart beat detector	New												
VIL OG-05	GYNECOLOGY AND OBSTETRICS													
VIL OG-06	Delivery bed	New								2	VIL OG-01	A-017	Delivery bed	To be planned in OB/GN room
VIL OG-07	Ultrasound unit, B/W	New								1	VIL OG-04	A-108	Ultrasound unit, B/W	To be planned in OB/GN room
VIL OG-08	Operation light, mobile	New								2	VIL OG-05	A-034	Examination light, mobile	To be planned in OB/GN room
VIL OG-09	Anesthesia machine	New	x											
VIL OG-10	Oxygen flow meter	New	x											
VIL OG-11	Operation table	New	x											
VIL OG-12	Autoclave	New								1	VIL OG-06	A-006	Autoclave, large	Already equipped in OR
VIL OG-13	Vacuum extractor	New								1	VIL OG-07	A-109	Vacuum extractor	Already equipped in OR
VIL OG-14	Water bath	New												
VIL OG-15	Drying oven	New	x											
VIL OG-16	Infant incubator	New	x											
VIL OG-17	Infant warmer	New								2	VIL OG-08	A-026	Drying oven	For OB/GN room
VIL OG-18	Infant warmer	New								2	VIL OG-09	A-043	Infant incubator	For protection of immature infants
VIL OG-19	Suction pump	New								1	VIL OG-10	A-044	Infant warmer	For protection of immature infants
VIL OG-20	Suction pump	New								2	VIL OG-11	A-099	Suction pump	For OB/GN room
VIL OG-21		New								1	VIL OG-12	A-051	Instrument set for delivery	2 sets including a spare for sterilization
VIL OG-22		New								1	VIL OG-13	A-023	Doppler Ultrasound Fetal heart beat detector	Basic equipment for detection of embryo conditions

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Op. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
	RADIOLOGY												RADIOLOGY	
VIL RD-01	X-ray unit, mobile	New								1	VIL RD-01	A-117	X-ray unit, mobile	To be used in the new OR, 2 X-ray technicians to be staffed
VIL RD-02	X-ray film viewer	New								1	VIL RD-02	A-113	X-ray film viewer	Basic item
VIL RD-03	X-ray film holder	New								1	VIL RD-03	A-112	X-ray film cassette set	Planned as film cassette
VIL RD-04	Dark room equipment	New								1	VIL RD-04	A-114	X-ray processing tank	To be supplied as manual type treatment tank
		New								1	VIL RD-05	A-118	X-ray protective set	Intended to use X-ray apparatus safely
	DENTAL CLINIC												DENTAL CLINIC	
VIL DT-01	Amalgam mixer	New								1	VIL DT-01	A-001	Amalgam mixer	A must equipment for cavity treatment
VIL DT-02	X-ray unit, dental	New								1	VIL DT-02	A-116	X-ray unit, dental	A must diagnostic equipment in dental room
VIL DT-03	Dental film holder	New								1				Included in DT-02
VIL DT-04	Operation light, dental mobile	New								2	VIL DT-03	A-018	Dental mastoid drill unit	Included in DT-06
VIL DT-05	Dental mastoid drill unit	New								1	VIL DT-04	A-020	Dental unit	2 sets including a spare for sterilization
VIL DT-06	Dental unit	New								1	VIL DT-05	A-007	Autoclave, small	3 dental technicians will be staffed
VIL DT-07	Dental aspirator	New								1	VIL DT-06	A-039	Film developer, dental	For sterilization of dental instruments
VIL DT-08	Autoclave, dental	New								1				Newly added to the list, necessary item for dental room
	OPHTHALMOLOGY												OPHTHALMOLOGY	
VIL OT-01	Sight test panel	New	x	x	x	x	x	x	x					Request not clearly confirmed
VIL OT-02	Slit lamp	New								1	VIL OT-01	A-094	Slit lamp with tonometer	To be combined with Tonometer
VIL OT-03	Examination chair, ophthalmology	New								1	VIL OT-02	A-033	Examination chair, ophthalmology	Basic items with simple and minimum specs
VIL OT-04	Trial lens, adult	New								1	VIL OT-03	A-104	Trial lens, adult	Necessary for prescription of glasses
VIL OT-05	Trial lens, child	New								1	VIL OT-04	A-105	Trial lens, child	Necessary for prescription of glasses
VIL OT-06	Retinoscope	New								1	VIL OT-05	A-090	Retinoscope	Necessary for diagnosis of cataract
VIL OT-07	Chart for near vision test	New	x	x										Overlapped with OT-12
VIL OT-08	Pen light	New								1	VIL OT-06	A-084	Pen light	Basic item
VIL OT-09	Slit microscope	New								1	VIL OT-07	A-075	Ophthalmic loupe	Basic diagnostic item for ophthalmology
VIL OT-10	Ophthalmoscope, electrical	New								1	VIL OT-08	A-077	Ophthalmoscope, electrical	A must diagnostic equipment in dental room
VIL OT-11	Ophthalmoscope, battery	New								1	VIL OT-09	A-076	Ophthalmoscope, battery	A must diagnostic equipment in dental room
VIL OT-12	Ophthalmoscope, direct	New	x	x						1				Overlapped with OT-11
VIL OT-13	Ophthalmoscope, indirect	New								1	VIL OT-10	A-078	Ophthalmoscope, indirect	For diagnosis of peripheral part of eye ball
VIL OT-14	Examination light, mobile	New								1	VIL OT-11	A-034	Examination light, mobile	Basic item
VIL OT-15	Snellen's chart, E-type	New								1	VIL OT-12	A-095	Snellen's chart, E-type	For screening, Snellen type
VIL OT-16	Refractometer	New								1	VIL OT-13	A-089	Refractometer	For accurate measurement of shortsight or astigma
VIL OT-17	Tonometer	New												Included in OT-02
	EMERGENCY OBSTETRIC CARE												EMERGENCY OBSTETRIC CARE	
VIL EM-01	Instrument set for caesarean section	New								2	VIL EM-01	A-049	Instrument set for caesarean section	2 sets including a spare for sterilization
VIL EM-02	Instrument set for obstetric	New								1	VIL EM-02	A-002	Ambu bag set	Overlapped with EM-01
VIL EM-03	Resuscitator, for neonate with mask	New								2	VIL EM-03	A-056	Instrument set for vaginal tears	A must item for resuscitation in ER
VIL EM-04	Resuscitator for adult	New								2	VIL EM-04	A-015	D & C set	Included in EM-03
VIL EM-05	Instrument set for vaginal tears	New								2	VIL EM-04			2 sets including a spare for sterilization
VIL EM-06	D & C set	New												2 sets including a spare for sterilization
	EMERGENCY ROOM												EMERGENCY ROOM	
VIL EM-07	Emergency unit set	New								1	VIL EM-06	A-029	Emergency cart	A must item for ER
VIL EM-08	Instrument set for cardiology and thoracic	New								2	VIL EM-07	A-050	Instrument set for cardiology and thoracic	2 sets including a spare for sterilization
	PHYSIOTHERAPY												PHYSIOTHERAPY	
VIL PT-01	Shortwave therapy unit	New								1	VIL PT-01	A-093	Shortwave therapy unit	A must item for basic physiotherapy treatment
VIL PT-02	Muscle stimulator	New								1	VIL PT-02	A-068	Muscle stimulator	A must item for basic physiotherapy treatment
VIL PT-03	Infrared lamp	New								1	VIL PT-03	A-045	Infrared lamp	A must item for basic physiotherapy treatment
VIL PT-04	Ultrasound therapy unit	New								1	VIL PT-04	A-106	Ultrasound therapy unit	A must item for basic physiotherapy treatment
VIL PT-05	Interferential therapy unit	New	x	x	x	x	x	x	x	1	VIL PT-05	A-038	Exercise mat	Request not clearly confirmed
VIL PT-06	Exercise mat	New	x	x	x	x	x	x	x					Multi purpose mat, also used for exercise instruction
VIL PT-07	Universal foot pump	New	x	x	x	x	x	x	x					Request not clearly confirmed
VIL PT-08	Traction table	New												Included in PT-20
VIL PT-09	Overhead frame	New												Included in PT-20

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Op. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
BEU TR-08	Computer with UPS for training exclusively	Rep								3	BEU TR-07	B-007	Computer with UPS	1 for Management Dep. And 2 for Training Dep.
BEU TR-09	Printer	Rep								1	BEU TR-08	B-008	Printer	1 for Management Dep. And 1 for Training Dep. There is 1 existing that can be used.
BEU TR-10	Bread board with wires	Ren		x					x				Bread board with wires	Excluded because this item overlaps with Electronic training kit for digital
BEU TR-11	Hand-held Frequency counter	New		x					x				Hand-held Frequency counter	Excluded because function of this item can be substituted by Frequency counter
BEU TR-12	Frequency counter	New								1	BEU TR-09	B-011	Frequency counter	1 for Electronic Dep.
BEU TR-13	Sound level measurement	New								1	BEU TR-10	B-012	Sound level measurement	1 for Electronic Dep.
BEU TR-14	pH meter	New								2	BEU TR-11	B-013	pH meter	1 for Workshop, 1 for Electrical Dep.
BEU TR-15	Hand held Digital Oscilloscope	New								3	BEU TR-12	B-014	Hand held Digital Oscilloscope	1 for Workshop, 2 for Electronic Dep.
BEU TR-16	Light Intensity measuring meter in Lux	New								1	BEU TR-13	B-015	Light Intensity measuring meter	1 for Electronic Dep. To carry outside
BEU TR-17	Flow measuring meter (Digital)	New								1	BEU TR-14	B-016	Flow measuring meter (Digital)	1 for ME (Operation) Dep.
BEU TR-18	Aneroid Barometer	New								2	BEU TR-15	B-017	Aneroid Barometer	1 for Workshop, 1 for Electrical Dep.
	For Testing and calibrating													
BEU TC-01	Multi-parameter X-ray meters	New								1	BEU TC-01	B-018	X-ray meters, Multi-parameter	1 for ME (X-ray) Dep.
BEU TC-02	Ventilator calibrator	New								1	BEU TC-02	B-019	Ventilator calibrator	1 for ME (Operation) Dep.
BEU TC-03	Safety analyzer	New								1	BEU TC-03	B-020	Safety analyzer	1 for Electronic Dep.
BEU TC-04	ECG simulator	New								1	BEU TC-04	B-021	ECG simulator	1 for Electronic Dep.
BEU TC-05	Microprocessor Kit for micro processor programming with AD/DA converter	New								5	BEU TC-05	B-022	Microprocessor training kit	1 per 2 trainees = 5 units
BEU TC-06	Defibrillator energy testing analyzer	New								1	BEU TC-06	B-023	Defibrillator energy testing analyzer	1 for Electronic Dep.
BEU TC-07	Oxygen sensing monitor	New	x	x					x				Oxygen sensing monitor	Excluded because its purpose is unclear
BEU TC-08	Laser protective glass	New								2	BEU TC-07	B-025	Laser protective glass	1 for ME (X-ray) Dep. And 1 for Electronic Dep.
BEU TC-09	Radiation detector X-ray	New								1	BEU TC-08	B-026	Radiation detector X-ray	1 for ME (X-ray) Dep.
BEU TC-10	IC remover	New								2	BEU TC-09	B-027	IC remover	1 to be used in Electronic Dep. And 1 to be outside of it
BEU TC-11	IC Tester	Ren		x					x				IC Tester	Excluded because it is irrelevant to the activity of BEU
BEU TC-12	Low ohm meter	New								2	BEU TC-10	B-028	Low ohm meter	1 for Electronic and 1 for Electrical Dep.
BEU TC-13	Electrician's tool kit	Ren								4	BEU TC-11	B-029	Electrician's tool kit	2 to be used in Electrical Dep. And 2 to be outside of it
BEU TC-14	Electronic service tool	Rep								13	BEU TC-12	B-030	Electronic service tool	To be used by 18 staff (17 ME engineers and 1 trainee). There are 5 existing that can be used.
BEU TC-15	PC service kit	Rep								2	BEU TC-13	B-031	PC service kit	3 units (2 for Workshop and 1 for PC Dep.) are needed. There is 1 existing that can be used.
BEU TC-16	Mechanic's tool kit	Rep								2	BEU TC-14	B-032	Mechanic's tool kit	3 units (2 for Workshop and 1 for Refrigerator Dep.) are needed. There is 1 existing that can be used.
BEU RT-01	For both repair and training materials	New	x	x					x				For both repair and training materials	
BEU RT-02	Contact tachometer	New											Contact tachometer	Excluded because its purpose is unclear
BEU RT-03	Optical tachometer	New								2	BEU RT-01	B-035	Optical tachometer	To be included in Optical tachometer
BEU RT-04	Stethoscope for machine inspection	Ren								2	BEU RT-02	B-036	Stethoscope for machine inspection	1 for Workshop, 1 for Electronic Dep.
BEU RT-05	Set of different size of extension and	Rep		x					x				Set of different size of extension and	Excluded because this item can be purchased by the recipient.
BEU RT-06	Set of fiber washing kit	Rep		x					x				Set of fiber washing kit	Excluded because this item can be purchased by the recipient.
BEU RT-07	Vaseline grease for high voltage in X-ray unit	Rep		x					x				Vaseline grease for high voltage in X-ray unit	Excluded because this item can be purchased by the recipient.
BEU RT-08	Micro tech tool set	Rep								6	BEU RT-03	B-037	Micro tech tool set	8 units (3 for Electronic, 1 for Electrical, 4 for PC Dep.) are needed, there are 2 existing that can be used.
BEU RT-09	L shaped Torx drivers sets,	New								6	BEU RT-04	B-038	L shaped Torx drivers sets,	2 for Electronic Dep., 1 for Electrical Dep., 3 for PC Dep.
BEU RT-10	Three stage hot air gun	Rep								3	BEU RT-05	B-039	Three stage hot air gun	1 for Electronic Dep., 1 for Electrical Dep., 1 for PC Dep.

Examination of the Requested Equipment

Request No.	Request Description	Classification	Purpose	Necessity	Tec. Level	Staff	Maintenance	Opn. Cost	Judgement	Planned Qty	Delivery No.	Item No.	BD Description	Remarks
BEU RT-11	Service engineer's vacuum cleaners	New								4	BEU RT-06	B-040	Service engineer's vacuum cleaners	1 for Electronic., 1 for Electrical Dep., 1 for Refrigerator Dep., 1 for MR (X-ray) Dep.
BEU RT-12	Socket wrench set	Rep								6	BEU RT-07	B-041	Socket wrench set	8 units (3 for Electronic, 3 for Electrical, 2 for PC Dep.) are needed, there are 2 existing that can be used.
BEU RT-13	Bench magnifiers with light	Ren								5	BEU RT-08	B-042	Bench magnifiers with light	2 for Electronic Dep., 1 for Electrical Dep., 2 for PC Dep.
BEU RT-14	"O" ring kit mixed sizes	Rep		x					x					Excluded because this item can be purchased by the recipient.
BEU RT-15	Contact treatment	Rep		x					x					Excluded because this item can be purchased by the recipient.
BEU RT-16	High temperature grease	Rep		x					x					Excluded because this item can be purchased by the recipient.
BEU RT-17	Silicone grease	Rep		x					x					Excluded because this item can be purchased by the recipient.
BEU RT-18	Altimeter	New								2	BEU RT-09	B-043	Altimeter	To be shared by all the departments
BEU RT-19	Scientific calculator	New								4	BEU RT-10	B-044	Scientific calculator	2 for Electronic Dep., 2 for Training Dep.
BEU RT-20	Magnetic screw driver kit long handle	New								4	BEU RT-11	B-045	Magnetic screw driver kit long handle	2 for Electronic Dep., 2 for Electrical Dep.
BEU RT-21	Precision soldering iron with fine tips	New								5	BEU RT-12	B-046	Precision soldering iron with fine tips	1 items to be shared by 4 staffs; 5 items / 20 engineers (17 ME engineers, 2 electrical engineers, 1 trainee)
BEU RT-22	D.C. power supply	Ren								2	BEU RT-13	B-047	D.C. power supply	1 for Electrical Dep., 1 for Electronic Dep.
BEU RT-23	Variable current sources	Ren		x					x					Excluded because its purpose is unclear
BEU TL-01	For Tools and Instruments from the Section Battery charger (12V, 24V), variable current	Ren								2	BEU TL-01	B-048	Battery charger (12V, 24V), variable current	1 for Workshop, 1 for Refrigerator Dep.
BEU TL-02	Hydrometer	Ren								2	BEU TL-02	B-049	Hydrometer	1 for Workshop, 1 for Refrigerator Dep.
BEU TL-03	Oscilloscope 100Mhz	Ren								2	BEU TL-03	B-050	Oscilloscope 100Mhz	1 for Electrical Dep., 1 for Electronic Dep.
BEU TL-04	Antistatic pad with strap	New								2	BEU TL-04	B-051	Antistatic pad with strap	1 for Electronic Dep., 1 for PC Dep.
BEU MS-01	Digital multimeter	New								2	BEU MS-01	B-052	Digital multimeter	1 for Electrical Dep., 1 for Electronic Dep.
BEU MS-02	Digital clamp meter	Ren								2	BEU MS-02	B-053	Digital clamp meter	1 for Workshop, 1 for Electrical Dep. To be carried out
BEU MS-03	Soldering iron of heavy duty 250W	New							x					To be included in Mechanic's tool kit
BEU MS-04	Soldering iron of 40W	New		x					x					Excluded because this item can be purchased by the recipient.
BEU MS-05	Soldering iron of 60W	Rep							x					To be included in Electrician's tool kit
BEU MS-06	Soldering iron of 100W	New							x					To be included in Mechanic's tool kit
BEU MS-07	Soldering gun of different range 20-130W	New		x					x					Excluded because this item overlaps with Precision soldering iron with fine tips
BEU MS-08	Sucker	Rep							x					To be included in Electronic service tool and Electrician's tool kit
BEU MS-09	Gas leak detector for anesthesia machine	New		x					x					Excluded because its purpose is unclear
BEU WD-01	For wood work Wood work tool sets (Electric drill, Glass cutter, Files sets, Chisels sets, Saw, Planner)	Rep								1	BEU WD-01	B-060	Wood work tool sets	For 2 woodworkers, there is 1 existing item that can be used
BEU PL-01	For plumber Plumber tool sets (Thread cutter, Mason chisel, iron chisels, Hack saw, Files sets, Pipe wrench)	Rep								1	BEU PL-01	B-061	Plumber tool sets	For 1 plumber

Appendices-7 Equipment List

Equipment List

Appendices-7

Item No.	Description	Facilities	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU
		Total Q'ty	Q'ty	Q'ty	Q'ty	Q'ty	Q'ty
A-001	Amalgam mixer	3		1	1	1	
A-002	Ambu bag set	3		1	1	1	
A-003	Anesthesia machine, A	3	3				
A-004	Anesthesia machine, B	3		1		2	
A-005	Anesthesia tables	5	5				
A-006	Autoclave, large	1				1	
A-007	Autoclave, small	4		2	1	1	
A-008	Autoclave, vertical	4	2		2		
A-009	Automatic film developer	1	1				
A-010	Blood cell counter	4	2			2	
A-011	Bowl stand	2		1	1		
A-012	Cautery unit	11	6	1	2	2	
A-013	Centrifuge	7	3	1	1	2	
A-014	Cupboard, drug	4		2		2	
A-015	D & C set	2				2	
A-016	Defibrillator	4	1	1	2		
A-017	Delivery bed	4		2		2	
A-018	Instrument set for dental	6		2	2	2	
A-019	Dental scaler	1	1				
A-020	Dental unit	2		1		1	
A-021	Distiller	1	1				
A-022	Doppler machine	2	2				
A-023	Doppler Ultrasound Fetal heart beat detector	2			1	1	
A-024	Drill, electrical	1	1				
A-025	Drug refrigerator	5	3		1	1	
A-026	Drying oven	10	2	2		6	
A-027	ECG	2		1	1		
A-028	Electrical dermatome	1	1				
A-029	Emergency cart	3		1	1	1	
A-030	Endoscope set for lower digestive organs	1	1				
A-031	Endoscope set for upper digestive organs	1	1				
A-032	Endoscope set, ENT	1	1				
A-033	Examination chair, ophthalmology	3		1	1	1	
A-034	Examination light, mobile	15		4	3	8	
A-035	Examination table	4		2	2		
A-036	Examination tabel, OB/GY	2				2	

Equipment List

Appendices-7

Item No.	Description	Facilities	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU
		Total Q'ty	Q'ty	Q'ty	Q'ty	Q'ty	Q'ty
A-037	Exercise bike	3	1	1		1	
A-038	Exercise mat	3	1	1		1	
A-039	Film developer, dental	3		1	1	1	
A-040	Generator, 150KVA	1				1	
A-041	Gypsum cutter, electrical	2		1	1		
A-042	I.V. stand	3		2	1		
A-043	Infant incubator	6		2	2	2	
A-044	Infant warmer	4		2		2	
A-045	Infrared lamp	2		1		1	
A-046	Infusion pump	2		1	1		
A-047	Instrument cabinet	5		2	1	2	
A-048	Instrument set for bone	2				2	
A-049	Instrument set for caesarean section	6		2	2	2	
A-050	Instrument set for cardiology and thoracic	2				2	
A-051	Instrument set for delivery	2				2	
A-052	Instrument set for gypsum	3	1	1	1		
A-053	Instrument set for major abdominal	8	2	2	2	2	
A-054	Instrument set for minor abdominal	8	2	2	2	2	
A-055	Instrument set for nasal and plastic	2	2				
A-056	Instrument set for vaginal tears	2				2	
A-057	Instrument table	1			1		
A-058	Instrument trolley	10		2	1	7	
A-059	Instruments, theater gynecology	2		2			
A-060	Instruments, theater tracheotomy	8	2	2	2	2	
A-062	Laryngoscope set, Mackintosh	4		2		2	
A-064	Lung function tester	1			1		
A-065	Mayo table	4		4			
A-066	Medicine ball set	2		1		1	
A-067	Microscope, binocular	7	3	1		3	
A-068	Muscle stimulator	2		1		1	
A-069	Operation light, mobile	11	3	4	2	2	
A-070	Operation microscope, ophthalmic	1		1			
A-071	Operation stool	4		2		2	
A-072	Operation table	8	2	2	2	2	
A-073	Operation table, orthopedic	2	2				
A-074	Fiber head light with light source	1	1				
A-075	Ophthalmic loupe	2			1	1	

Equipment List

Appendices-7

Item No.	Description	Facilities	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU
		Total Q'ty	Q'ty	Q'ty	Q'ty	Q'ty	Q'ty
A-076	Ophthalmoscope, battery	5		2	2	1	
A-077	Ophthalmoscope, electrical	3		1	1	1	
A-078	Ophthalmoscope, indirect	3		1	1	1	
A-079	Oxygen regulator set	3		1		2	
A-080	Parallel bars	1				1	
A-081	Patient monitor, A	1	1				
A-082	Patient monitor, B	4	2	1	1		
A-083	Peak flow meter	1		1			
A-084	Pen light	3		1	1	1	
A-085	Physiotherapy unit, mobile	2		1		1	
A-086	Plaster bandage table	2		1	1		
A-087	Puch up block set	2		1		1	
A-088	Pulse oxymeter	5	1	1	3		
A-089	Refractometer	3		1	1	1	
A-090	Retinoscope	3		1	1	1	
A-091	Screen	5				5	
A-092	Shaker	2			1	1	
A-093	Microwave therapy unit	2		1		1	
A-094	Slit lamp with tonometer	2		1		1	
A-095	Snellen's chart, E-type	3		1	1	1	
A-096	Sphygmomanometer	2		2			
A-097	Stethoscope	2		2			
A-098	Stretcher	6	4	1	1		
A-099	Suction pump	11	2	3	3	3	
A-100	Suction pump, small	3	1	1	1		
A-101	Tally counter	2				2	
A-102	Timer	3				3	
A-103	Traction pulley	3	1	1		1	
A-104	Trial lens, adult	2		1		1	
A-105	Trial lens, child	2		1		1	
A-106	Ultrasound therapy unit	2		1		1	
A-107	Ultrasound unit, color doppler	1	1				
A-108	Ultrasound unit, B/W	3		1	1	1	
A-109	Vacuum extractor	3		1	1	1	
A-110	Walk exercise step	2		1		1	
A-111	Wheel chair, foldable	4		2	2		
A-112	X-ray film cassette set	2		1		1	

Equipment List

Appendices-7

Item No.	Description	Facilities	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU
		Total Q'ty	Q'ty	Q'ty	Q'ty	Q'ty	Q'ty
A-113	X-ray film viewer	2		1		1	
A-114	X-ray processing tank	3		1	1	1	
A-115	X-ray unit, C-arm	1		1			
A-116	X-ray unit, dental	3		1	1	1	
A-117	X-ray unit, mobile	3	1		1	1	
A-118	X-ray protective set	4	1	1	1	1	
B-001	Function Generator	2					2
B-002	Slidac	1					1
B-003	Electronic training kit for digital	10					10
B-004	BP monitor calibrating means	2					2
B-005	Digital multimeter	1					1
B-006	Electronic components for training	10					10
B-007	Computer with UPS	3					3
B-008	Printer	1					1
B-011	Frequency counter	1					1
B-012	Sound level measurement	1					1
B-013	pH meter	2					2
B-014	Hand held Digital Oscilloscope	3					3
B-015	Light Intensity measuring meter	1					1
B-016	Flow measuring meter (Digital)	1					1
B-017	Aneroid Barometer	2					2
B-018	X-ray meters, Multi-parameter	1					1
B-019	Ventilator calibrator	1					1
B-020	Safety analyzer	1					1
B-021	ECG simulator	1					1
B-022	Microprocessor training kit	5					5
B-023	Defibrillator energy testing analyzer	1					1
B-025	Laser protective glass	2					2
B-026	Radiation detector X-ray	1					1
B-027	IC remover	2					2
B-028	Low ohm meter	2					2
B-029	Electrician's tool kit	4					4
B-030	Electronic service tool	13					13
B-031	PC service kit	2					2
B-032	Mechanic's tool kit	2					2
B-035	Optical tachometer	2					2
B-036	Stethoscope for machine inspecution	2					2

Equipment List

Appendices-7

Item No.	Description	Facilities	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU
		Total Q'ty	Q'ty	Q'ty	Q'ty	Q'ty	Q'ty
B-037	Micro tech tool set	6					6
B-038	L shaped Torx drivers sets,	6					6
B-039	Three stage hot air gun	3					3
B-040	Service engineer's vacuum cleaners	4					4
B-041	Socket wrench set	6					6
B-042	Bench magnifiers with light	5					5
B-043	Altimeter	2					2
B-044	Scientific calculator	4					4
B-045	Magnetic screw driver kit long handle	4					4
B-046	Precision soldering iron with fine tips	5					5
B-047	D.C. power supply	2					2
B-048	Battery charger (12V, 24V), variable current	2					2
B-049	Hydrometer	2					2
B-050	Oscilloscope 100Mhz	2					2
B-051	Antistatic pad with strap	2					2
B-052	Digital multimeter	2					2
B-053	Digital clamp meter	2					2
B-060	Wood work tool sets	1					1
B-061	Plumber tool sets	1					1

Appendices-8 Outline of Major Equipment

Outline of Major Equipment

Appendices-8

Item No.	Description	Country of origin	Procured from	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of equipment grade
A-003	Anesthesia machine, A	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Main unit, Base unit trolley with safety flow meter unit, Halothane vaporizer, Ventilator for anaesthetic apparatus 2. Anesthesia circuit: Closed type 3. Flow meter range <ol style="list-style-type: none"> 1) O₂ Minimum: 0.2 liter/min. or less Maximum: 10 liter/min. or more 2) AIR Minimum: 0.2 liter/min. or less Maximum: 10 liter/min. or more 4. Anesthesia gas: Halothane 5. Tidal volume range <ol style="list-style-type: none"> 1) Minimum: 50 ml or less 2) Maximum: 1200 ml or more 6. Breathing rate range <ol style="list-style-type: none"> 1) Minimum: 5 breaths/min or less 2) Maximum: 60 breaths/min or more 7. Safety function (Alarm): Provided 	Middle	3	To give general anesthesia before operation, and use as ventilator for patient who is absence of spontaneous respiration during operation. For central piping.
A-004	Anesthesia machine, B	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Main unit, Base unit trolley with safety flow meter unit, Halothane vaporizer, Ventilator for anaesthetic apparatus, Air compressor for ventilator (if necessary) 2. Anesthesia circuit: Closed type 3. Flow meter range <ol style="list-style-type: none"> 1) O₂ Minimum: 0.2 liter/min. or less Maximum: 10 liter/min. or more 2) AIR Minimum: 0.2 liter/min. or less Maximum: 10 liter/min. or more 4. Anesthesia gas: Halothane 5. Tidal volume range <ol style="list-style-type: none"> 1) Minimum: 50 ml or less 2) Maximum: 1200 ml or more 6. Breathing rate range <ol style="list-style-type: none"> 1) Minimum: 6 breaths/min or less 2) Maximum: 60 breaths/min or more 7. Safety function (Alarm): Provided 	Middle	3	To give general anesthesia before operation, and use as ventilator for patient who is absence of spontaneous respiration during operation. For cylinder.
A-006	Autoclave, large	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Main unit, Water softener, Pre-filter unit, Boiler unit, Trolley 2. Type: Single door, cabinet type 3. Nominal chamber volume: 225 liters or more 4. Nominal temperature: 132 °C or more 5. Material of chamber: Stainless steel 6. Salt tank volume: 20kg or more 	Middle	1	To sterilize various surgical instruments and lines with high-pressure steam.
A-009	Automatic film developer	Japan	Japan	<ol style="list-style-type: none"> 1. Type: Automatic processing type 2. Processing film size: 10 x 10 to 35 x 43cm (4" x 4" to 14" x 17") or wider 3. Processing speed: 90 sec. or faster 4. Maximum throughput: 90 films/hr. or more at 24 x 30cm size film 	Middle	1	To develop various kinds of medical images like X-ray film.
A-020	Dental unit	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Dental chair unit, Air turbine handpiece, Air moter, Foot controler, Air compressor, Bur set 2. Dental chair unit <ol style="list-style-type: none"> 1) Chair top hight Lo-position: 46 cm or under High-position: 75 cm or upper 3. Air turbine handpiece <ol style="list-style-type: none"> 1) Rotation speed: Max. 20,000 rpm or more 2) Autoclave: Possible 4. Operating light <ol style="list-style-type: none"> 1) Bulb: Halogen 2) Lux.: 13,000 lux. or more 5. Air compressor <ol style="list-style-type: none"> 1) Air: 80 L/min or more 	Middle	2	To give dental checkup and care to patient.
A-024	Drill, electrical	USA	Japan	<ol style="list-style-type: none"> 1. Motor unit <ol style="list-style-type: none"> 1) Drill speed: 1,500rpm or more 2. Twist drill <ol style="list-style-type: none"> 1) Dimensions: Within 2.0 to 3.5mm dia. 3. Saw blade <ol style="list-style-type: none"> 1) Width: Within 9.0 to 16.5mm 2) Length: 18.0 to 41.0mm 4. Wire with round shaft <ol style="list-style-type: none"> 1) Dimensions: Within 0.8 to 3.0mm dia. 	Middle	1	To be used for drilling and reaming in orthopedic operation, such as complex fracture and bone tumor.

Outline of Major Equipment

Appendices-8

Item No.	Description	Country of origin	Procured from	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of equipment grade
A-028	Electrical dermatome	Germany	Japan	<ol style="list-style-type: none"> 1. Type: Electrical 2. Cutting thickness range: 0.2 to 0.75 mm or wider 3. Cutting wide range: 26 to 78 mm or wider 4. Skin graft mesher unit <ol style="list-style-type: none"> 1) Expansion ratio: 1:1.5, 1:3 or more ratio 	Middle	1	To slice skin in order to make skin grafts on raw area and skin ulcer.
A-030	Endoscope set for lower digestive organs	Japan	Japan	<ol style="list-style-type: none"> 1. Field of view: 140 degrees 2. Depth of field <ol style="list-style-type: none"> 1) Minimum: 4mm or less 2) Maximum: 100mm or more 3. Outer diameter of distal end: 12.8mm or less 4. Working length: 1680mm or more 5. Xenon light source: 100W or more 6. Monitor <ol style="list-style-type: none"> 1) Size: 19 inch or more 2) Type: LCD 	Middle	1	To diagnose a disorder from the rectum to large intestine.
A-031	Endoscope set for upper digestive organs	Japan	Japan	<ol style="list-style-type: none"> 1. Field of view: 140 degrees 2. Depth of field <ol style="list-style-type: none"> 1) Minimum: 6mm or less 2) Maximum: 100mm or more 3. Outer diameter of distal end: 9.8mm or less 4. Working length: 1030mm or more 5. Xenon light source: 100W or more 6. Monitor <ol style="list-style-type: none"> 1) Size: 19 inch or more 2) Type: LCD 	Middle	1	To diagnose a disorder from the esophagus to the stomach.
A-032	Endoscope set, ENT	Germany	Japan	<ol style="list-style-type: none"> 1. Components: Nasal endoscope (0, 30, 70 degree), Light Source unit with light cable 2. Nasal endoscope <ol style="list-style-type: none"> 1) Type: Telescope (Rigid) 2) Outer diameter of distal end: 4.0mm or less 3) Working length: 170mm or more 3. Lamp: Harogen, 100W or more 	Middle	1	To diagnose a disorder of the nasal cavity.
A-033	Examination chair, ophthalmology	Japan/Spain	Japan	<ol style="list-style-type: none"> 1. Elevation: Electric elevating type 2. Chart projector <ol style="list-style-type: none"> 1) Number of charts: 24 or more 2) Chart change over: 1 frame/0.2 sec. or less 3) Mask change over: 1 frame/0.3 sec. or less 3. Vision tester <ol style="list-style-type: none"> 1) Spherical lens: +16.75D to -19.00D (0.25D step) 2) Rotary prisms: 20 prism diopter each 	Middle	3	To diagnose a disorder of the anterior eye, such as vitreum and horny coat.
A-040	Generator, 150KVA	China	Eritrea	<ol style="list-style-type: none"> 1. Output, frequency: 150kVA 50Hz 2. Phase type: 3 phase, 4 wire 3. Engine type: Direct injection, turbocharged, water cooled 4. Fuel: Diesel 5. Fuel tank capacity: 370L or more 6. Dimensions: 3700(L) x 1300(W) x 1750(H) cm, allowance $\pm 10\%$ 	Middle	1	To be used as emergency power supply and standby power supply not to let life-support facilities go down during blackout.
A-053	Instrument set for major abdominal	Japan	Japan	<ol style="list-style-type: none"> 1. Components: 78 items 2. Material: Stainless steel 	Middle	8	To carry out major abdominal operation.
A-072	Operation table	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Mattress, Screen frame, Arm board with mattress, Shoulder support with pad, Body support with pad, Knee crutch with cover, pad and strap, Douche funnel with drainage hose, Waste receptacle can, X-ray cassette holder, Accessory cart 2. Height elevating: Manual oil pump pedal 3. Table top <ol style="list-style-type: none"> 1) Radiography: Possible 2) Dimensions: 1950(L) x 500(W)mm, allowance $\pm 5\%$ 4. Height adjustment <ol style="list-style-type: none"> 1) Lowest: 770mm or less 2) Highest: 960mm or more 5. Trendelenburg: 12° or more 6. Reverse trendelenburg: 20° or more 7. Lateral tilting: 20° or more (right and left) 8. Back-section: 45° up, 15° down or more 9. Leg-section: 90° down (detachable type) 10. Caster: Provided 	Middle	8	To place patient in a suitable position for various operations.

Outline of Major Equipment

Appendices-8

Item No.	Description	Country of origin	Procured from	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of equipment grade
A-073	Operation table, ophthalmic	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Mattress, Screen frame, Arm board with mattress, Spinal frame, X-ray cassette holder, Lower limb traction device set 2. Height elevating: Manual oil pump pedal 3. Table top <ol style="list-style-type: none"> 1) Radiography: Possible 2) Dimensions: 1950(L) x 500(W)mm, allowance $\pm 5\%$ 4. Height adjustment <ol style="list-style-type: none"> 1) Lowest: 770mm or less 2) Highest: 960mm or more 5. Trendelenburg: 12° or more 6. Reverse trendelenburg: 20° or more 7. Lateral tilting: 20° or more (right and left) 8. Back-section: 45° up, 15° down or more 9. Leg-section: 90° down (detachable type) 10. Caster: Provided 	Middle	2	To place patient in a suitable position for orthopedic operation.
A-081	Patient monitor, A	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Main unit, ECG connection cable, ECG electrode, Probe, Cuff, Adapter for etCO₂, IBP connection cable, CO connection cable, Recording paper, Rechargeable battery, Mobile cart, AVR 2. Measurement parameter: ECG, Respiration, SPO₂, NIBP, Temperature, IBP, CO₂ (etCO₂), CO 3. ECG leads: 3-electrode or more 4. Heart rate range <ol style="list-style-type: none"> 1) Minimum: 30 bpm or less 2) Maximum: 250 bpm or more 5. Measuring method: Impedance 6. Respiration rate range <ol style="list-style-type: none"> 1) Minimum: 4 resp./min. or less 2) Maximum: 120 resp./min. or more 7. SpO₂ measuring range <ol style="list-style-type: none"> 1) Minimum: 50% or less 2) Maximum: 100% 8. NIBP measuring range <ol style="list-style-type: none"> 1) Minimum: 25 mmHg or less 2) Maximum: 25 mmHg or more 9. Temperature measuring range <ol style="list-style-type: none"> 1) Lowest: 20°C or less 2) Highest: 40°C or more 10. IBP measuring range <ol style="list-style-type: none"> 1) Minimum: -25 mmHg or less 2) Maximum: 300 mmHg or more 11. CO₂ (etCO₂) measuring range <ol style="list-style-type: none"> 1) Minimum: 0.5 L/min or less 2) Maximum: 15 L/min or more 	Middle	1	To continue to monitor patient who is under general anesthesia and measure patient's vital sign in recovery room. Possible to measure IBP, CO ₂ , and CO.
A-082	Patient monitor, B	Japan	Japan	<ol style="list-style-type: none"> 1. Components: Main unit, ECG connection cable, ECG electrode, Probe, Cuff, Recording paper, Rechargeable battery, Mobile cart, AVR 2. Measurement parameter: ECG, Respiration, SPO₂, NIBP, Temperature 3. ECG leads: 3-electrode or more 4. Heart rate range <ol style="list-style-type: none"> 1) Minimum: 30 bpm or less 2) Maximum: 250 bpm or more 5. Measuring method: Impedance 6. Respiration rate range <ol style="list-style-type: none"> 1) Minimum: 4 resp./min. or less 2) Maximum: 120 resp./min. or more 7. SpO₂ measuring range <ol style="list-style-type: none"> 1) Minimum: 50% or less 2) Maximum: 100% 8. NIBP measuring range <ol style="list-style-type: none"> 1) Minimum: 25 mmHg or less 2) Maximum: 25 mmHg or more 9. Temperature measuring range <ol style="list-style-type: none"> 1) Lowest: 20°C or less 2) Highest: 40°C or more 	Middle	4	To continue to monitor patient who is under general anesthesia and measure patient's vital sign in recovery room.

Outline of Major Equipment

Appendices-8

Item No.	Description	Country of origin	Procured from	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of equipment grade
A-107	Ultrasound unit, color doppler	India	Japan	<ol style="list-style-type: none"> 1. Components: Main unit, Color monitor, Printer unit, Reference signal unit, Probe, AVR 2. Scanning method: Electronic sector, Electronic convex, Electronic linear 3. Image mode: B, M, and B/M 4. B-mode <ol style="list-style-type: none"> 1) Gray scale: 256 levels or more 2) Max. depth: 25 cm or more 5. Doppler-mode <ol style="list-style-type: none"> 1) Doppler methods: PWD, CWD, Color doppler 2) Sampling width <ul style="list-style-type: none"> Minimum: Min. 1 mm or less Maximum: Max.10 mm or more 3) Cine memory: Provided 6. Color monitor unit: 15-inch or more 	Middle	1	To be used for ultrasound diagnosis inside body, mainly for examination of abdominal organ, epidermides, and obstetric and gynecologic area.
A-108	Ultrasound unit, B/W	Korea	Japan	<ol style="list-style-type: none"> 1. Scanning method: Electronic convex, Electronic linear 2. Image mode: B, M, and B/M 3. Max. depth: 21cm or more 4. Probe hanger: Equipped 5. Display size: 12 inch or more 	Middle	3	To be used for ultrasound diagnosis inside body, mainly for examination of abdominal organ and thyroid gland.
A-115	X-ray unit, C-arm	Germany	Japan	<ol style="list-style-type: none"> 1. X-ray generator <ol style="list-style-type: none"> 1) Max. tube voltage: 110kV or more 2) Max. tube current: 20mA or more 3) Fluoroscopy current: 3mA or more 2. C-arm unit <ol style="list-style-type: none"> 1) Rotation: 0 to 90 degree or wider range 2) TV camera type: CCD 3) Foot switch: Equipped 	Middle	1	To carry out fluoroscopy diagnosis in operation room. (Orthopedic and Urology)
A-117	X-ray unit, mobile	Japan	Japan	<ol style="list-style-type: none"> 1. Type: Inverter or high frequency type 2. X-ray generator <ol style="list-style-type: none"> 1) Max. tube voltage: 125kV or more 2) Max. tube current: 100mA or more 3) mAs range <ul style="list-style-type: none"> Minimum: 4mAs or less Maximum: 100mAs or more 3. X-ray tube <ol style="list-style-type: none"> 1) Focal size: 1.0mm or less 2) Focal spot height: Max. 185cm or more 3) Arm horizontal extension: 40cm or more 4) Column rotation: ±270 degree or wider range 	Middle	3	To carry out emergency and/or brief radiographic diagnosis for patient who is unable to walk.

Appendices-9 Equipment Delivery List

Equipment Delivery List

Appendices-9

Delivery No.	Item No.	Description	Q'ty
HALIBET HOSPITAL			
OPERATION THEATER			
HAL	OP-01	A-016 Defibrillator	1
HAL	OP-02	A-081 Patient monitor, A	1
HAL	OP-03	A-099 Suction pump	2
HAL	OP-04	A-031 Endoscope set for upper digestive organs	1
HAL	OP-05	A-030 Endoscope set for lower digestive organs	1
HAL	OP-06	A-082 Patient monitor, B	2
HAL	OP-07	A-005 Anesthesia tables	5
HAL	OP-08	A-003 Anesthesia machine, A	3
HAL	OP-09	A-069 Operation light, mobile	3
HAL	OP-10	A-012 Cautery unit	6
HAL	OP-11	A-008 Autoclave, vertical	2
HAL	OP-12	A-024 Drill, electrical	1
HAL	OP-13	A-022 Doppler machine	1
HAL	OP-14	A-098 Stretcher	4
HAL	OP-15	A-072 Operation table	2
HAL	OP-16	A-032 Endoscope set, ENT	1
HAL	OP-17	A-028 Electrical dermatome	1
HAL	OP-18	A-073 Operation table, orthopedic	2
HAL	OP-19	A-055 Instrument set for nasal and plastic	2
IMAGING DIAGNOSIS AND RADIOLOGY			
HAL	RD-01	A-117 X-ray unit, mobile	1
HAL	RD-02	A-107 Ultrasound unit, color doppler	1
HAL	RD-03	A-009 Automatic film developer	1
HAL	RD-04	A-118 X-ray protective set	1
LABORATORY			
HAL	LB-01	A-013 Centrifuge	3
HAL	LB-02	A-026 Drying oven	2
HAL	LB-03	A-021 Distiller	1
HAL	LB-04	A-025 Drug refrigerator	3
HAL	LB-05	A-067 Microscope, binocular	3
HAL	LB-06	A-010 Blood cell counter	2
ENT			
HAL	EN-01	A-074 Loupe, ENT	1
HAL	EN-02	A-100 Suction pump, small	1
BURN			
ORTHOPEDIC			
HAL	OR-01	A-052 Instrument set for gypsum	1
DENTAL			
HAL	DT-01	A-019 Dental scaler	1
DIABETES THERAPY			
HAL	DI-01	A-022 Doppler machine	1
HAL	DI-02	A-088 Pulse oxymeter	1
HAL	DI-03	A-037 Exercise bike	1

Equipment Delivery List

Appendices-9

Delivery No.		Item No.	Description	Q'ty
HAL	DI-04	A-103	Traction pulley	1
HAL	DI-05	A-038	Exercise mat	1
ADDITIONAL ITEMS FOR FOUR HOSPITALS				
HAL	AD-01	A-060	Instruments, theater tracheotomy, extras	2
HAL	AD-02	A-053	Instrument set for major abdominal	2
HAL	AD-03	A-054	Instrument set for minor abdominal	2
AGORDAT HOSPITAL				
OPERATION THEATER				
AGO	OP-01	A-072	Operation table	2
AGO	OP-02	A-069	Operation light, mobile	2
AGO	OP-03	A-071	Operation stool	2
AGO	OP-04	A-047	Instrument cabinet	2
AGO	OP-05	A-058	Instrument trolley	2
AGO	OP-06	A-014	Cupboard, drug	2
AGO	OP-07	A-099	Suction pump	2
AGO	OP-08	A-004	Anesthesia machine, B	1
AGO	OP-09	A-062	Laryngoscope set, Mackintosh	2
AGO	OP-10	A-079	Oxygen regulator set	1
AGO	OP-11	A-012	Cautery unit	1
AGO	OP-12	A-081	Patient monitor, A	1
AGO	OP-13	A-046	Infusion pump	1
AGO	OP-14	A-070	Operation microscope	1
EMERGENCY DEPARTMENT				
AGO	EM-01	A-035	Examination table	2
AGO	EM-02	A-096	Sphygmomanometer	2
AGO	EM-03	A-097	Stethoscope	2
AGO	EM-04	A-098	Stretcher	1
AGO	EM-05	A-111	Wheel chair, foldable	2
AGO	EM-06	A-076	Ophthalmoscope, battery	1
AGO	EM-07	A-065	Mayo table	1
AGO	EM-08	A-042	I.V. stand	2
AGO	EM-09	A-086	Plaster bandage table	1
AGO	EM-10	A-041	Gypsum cutter, electrical	1
AGO	EM-11	A-100	Suction pump, small	1
AGO	EM-12	A-002	Ambu bag set	1
AGO	EM-13	A-052	Instrument set for gypsum	1
AGO	EM-15	A-016	Defibrillator	1
AGO	EM-16	A-029	Emergency cart	1
AGO	EM-17	A-088	Pulse oxymeter	1
AGO	EM-18	A-034	Examination light, mobile	1
AGO	EM-19	A-011	Bowl stand	1
AGO	EM-20	A-027	ECG	1
AGO	EM-21	A-083	Peak flow meter	1
IMAGING DIAGNOSIS				
AGO	RD-01	A-115	X-ray unit, C-arm	1
AGO	RD-02	A-113	X-ray film viewer	1

Equipment Delivery List

Appendices-9

Delivery No.		Item No.	Description	Q'ty
AGO	RD-03	A-112	X-ray film cassette set	1
AGO	RD-04	A-114	X-ray processing tank	1
AGO	RD-05	A-118	X-ray protective set	1
LABORATORY				
AGO	LB-01	A-067	Microscope, binocular	1
AGO	LB-02	A-013	Centrifuge	1
AGO	LB-03	A-026	Drying oven	1
GENERAL				
AGO	GN-01	A-065	Mayo table	3
AGO	GN-02	A-034	Examination light, mobile	2
PHYSIOTHERAPY EQUIPMENT				
AGO	PT-01	A-085	Physiotherapy unit, mobile	1
AGO	PT-02	A-093	Shortwave therapy unit	1
AGO	PT-03	A-068	Muscle stimulator	1
AGO	PT-04	A-045	Infrared lamp	1
AGO	PT-05	A-106	Ultrasound therapy unit	1
AGO	PT-06	A-038	Exercise mat	1
AGO	PT-07	A-087	Puch up block set	1
AGO	PT-08	A-037	Exercise bike	1
AGO	PT-09	A-103	Traction pulley	1
AGO	PT-10	A-110	Walk exercise step	1
AGO	PT-11	A-066	Medicine ball set	1
GYNECOLOGY AND OBSTETRICS EQUIPMENT				
AGO	OG-01	A-017	Delivery bed	2
AGO	OG-02	A-108	Ultrasound unit, B/W	1
AGO	OG-03	A-069	Operation light, mobile	2
AGO	OG-04	A-007	Autoclave, small	1
AGO	OG-05	A-109	Vacuum extractor	1
AGO	OG-06	A-026	Drying oven	1
AGO	OG-07	A-043	Infant incubator	2
AGO	OG-08	A-044	Infant warmer	2
AGO	OG-09	A-099	Suction pump	1
DENTAL EQUIPMENT				
AGO	DT-01	A-001	Amalgam mixer	1
AGO	DT-02	A-116	X-ray unit, dental	1
AGO	DT-03	A-018	Dental mastoid drill unit	2
AGO	DT-04	A-020	Dental unit	1
AGO	DT-05	A-007	Autoclave, small	1
AGO	DT-06	A-039	Film developer, dental	1
OPHTHALMIC EQUIPMENT				
AGO	OT-01	A-094	Slit lamp with tonometer	1
AGO	OT-02	A-033	Examination chair, ophthalmology	1
AGO	OT-03	A-104	Trial lens, adult	1
AGO	OT-04	A-105	Trial lens, child	1
AGO	OT-05	A-090	Retinoscope	1
AGO	OT-06	A-089	Refractometer	1

Equipment Delivery List

Appendices-9

Delivery No.		Item No.	Description	Q'ty
AGO	OT-07	A-084	Pen light	1
AGO	OT-08	A-077	Ophthalmoscope, electrical	1
AGO	OT-09	A-076	Ophthalmoscope, battery	1
AGO	OT-10	A-078	Ophthalmoscope, indirect	1
AGO	OT-11	A-034	Examination light, mobile	1
AGO	OT-11	A-095	Snellen's chart, E-type	1
ADDITIONAL ITEMS FOR FOUR HOSPITALS				
AGO	AD-01	A-049	Instrument set for caesarean section	2
AGO	AD-02	A-059	Instruments, theater gynecology, extras	2
AGO	AD-03	A-060	Instruments, theater tracheotomy, extras	2
AGO	AD-04	A-053	Instrument set for major abdominal	2
AGO	AD-05	A-054	Instrument set for minor abdominal	2
MASSAWA HOSPITAL				
OPERATION THEATER				
MAS	OP-01	A-069	Operation light, mobile	2
MAS	OP-02	A-072	Operation table	2
MAS	OP-03	A-016	Defibrillator	1
MAS	OP-04	A-088	Pulse oxymeter	2
MAS	OP-05	A-099	Suction pump	2
MAS	OP-06	A-109	Vacuum extractor	1
MAS	OP-07	A-012	Cautery unit	2
MAS	OP-08	A-008	Autoclave, vertical	2
MAS	OP-09	A-043	Infant incubator	2
MAS	OP-10	A-081	Patient monitor, A	1
EMERGENCY DEPARTMENT				
MAS	EM-01	A-035	Examination table	2
MAS	EM-02	A-098	Stretcher	1
MAS	EM-03	A-111	Wheel chair, foldable	2
MAS	EM-04	A-047	Instrument cabinet	1
MAS	EM-05	A-058	Instrument trolley	1
MAS	EM-06	A-007	Autoclave, small	1
MAS	EM-07	A-076	Ophthalmoscope, battery	1
MAS	EM-08	A-057	Instrument table	1
MAS	EM-09	A-042	I.V. stand	1
MAS	EM-10	A-086	Plaster bandage table	1
MAS	EM-11	A-041	Gypsum cutter, electrical	1
MAS	EM-12	A-099	Suction pump	1
MAS	EM-13	A-002	Ambu bag set	1
MAS	EM-14	A-052	Instrument set for gypsum	1
MAS	EM-15	A-016	Defibrillator	1
MAS	EM-16	A-029	Emergency cart	1
MAS	EM-17	A-088	Pulse oxymeter	1
MAS	EM-18	A-034	Examination light, mobile	1
MAS	EM-19	A-046	Infusion pump	1
MAS	EM-20	A-011	Bowl stand	1
MAS	EM-21	A-027	ECG	1

Equipment Delivery List

Appendices-9

Delivery No.		Item No.	Description	Q'ty
MAS	EM-22	A-064	Lung function tester	1
IMAGING DIAGNOSIS				
MAS	RD-01	A-117	X-ray unit, mobile	1
MAS	RD-02	A-114	X-ray processing tank	1
MAS	RD-03	A-108	Ultrasound unit, B/W	1
MAS	RD-04	A-023	Doppler Ultrasound Fetal heart beat detector	1
MAS	RD-05	A-118	X-ray protective set	1
LABORATORY				
MAS	LB-01	A-013	Centrifuge	1
MAS	LB-02	A-092	Shaker	1
MAS	LB-03	A-025	Drug refrigerator	1
OPHTHALMIC SECTION				
MAS	OT-01	A-033	Examination chair, ophthalmology	1
MAS	OT-02	A-090	Retinoscope	1
MAS	OT-03	A-089	Refractometer	1
MAS	OT-04	A-075	Ophthalmic loupe	1
MAS	OT-05	A-084	Pen light	1
MAS	OT-06	A-077	Ophthalmoscope, electrical	1
MAS	OT-07	A-076	Ophthalmoscope, battery	1
MAS	OT-08	A-078	Ophthalmoscope, indirect	1
MAS	OT-09	A-034	Examination light, mobile	1
MAS	OT-10	A-095	Snellen's chart, E-type	1
DENTAL UNIT				
MAS	DT-01	A-001	Amalgam mixer	1
MAS	DT-02	A-116	X-ray unit, dental	1
MAS	DT-03	A-034	Examination light, mobile	1
MAS	DT-04	A-018	Dental mastoid drill unit	2
MAS	DT-05	A-100	Suction pump, small	1
MAS	DT-06	A-039	Film developer, dental	1
ADDITIONAL ITEMS FOR FOUR HOSPITALS				
MAS	AD-01	A-049	Instrument set for caesarean section	2
MAS	AD-02	A-060	Instruments, theater tracheotomy, extras	2
MAS	AD-03	A-053	Instrument set for major abdominal	2
MAS	AD-04	A-054	Instrument set for minor abdominal	2
VILLAGIO GINIO HOSPITAL				
GENERAL				
VIL	GN-01	A-091	Screen	5
VIL	GN-02	A-058	Instrument trolley	5
VIL	GN-03	A-026	Drying oven	2
VIL	GN-04	A-034	Examination light, mobile	5
VIL	GN-05	A-036	Examination table, OB/GY	2
OPERATION THEATRE				
VIL	OP-01	A-072	Operation table	2
VIL	OP-02	A-069	Operation light, mobile	2
VIL	OP-03	A-071	Operation stool	2
VIL	OP-04	A-047	Instrument cabinet	2

Equipment Delivery List

Appendices-9

Delivery No.		Item No.	Description	Q'ty
VIL	OP-05	A-058	Instrument trolley	2
VIL	OP-06	A-014	Cupboard, drug	2
ANESTHESIA & RESUSCITATION				
VIL	OP-07	A-004	Anesthesia machine, B	2
VIL	OP-08	A-062	Laryngoscope set, Mackintosh	2
VIL	OP-09	A-079	Oxygen regulator set	2
VIL	OP-10	A-099	Suction pump	2
VIL	OP-11	A-012	Cautery unit	2
SURGICAL UNIT EQUIPMENT				
VIL	OP-12	A-053	Instrument set for major abdominal	2
VIL	OP-13	A-054	Instrument set for minor abdominal	2
VIL	OP-14	A-048	Instrument set for bone	2
VIL	OP-15	A-026	Drying oven	2
GYNECOLOGY AND OBSTETRICS				
VIL	OG-01	A-017	Delivery bed	2
VIL	OG-04	A-108	Ultrasound unit, B/W	1
VIL	OG-05	A-034	Examination light, mobile	2
VIL	OG-06	A-006	Autoclave, large	1
VIL	OG-07	A-109	Vacuum extractor	1
VIL	OG-08	A-026	Drying oven	1
VIL	OG-09	A-043	Infant incubator	2
VIL	OG-10	A-044	Infant warmer	2
VIL	OG-11	A-099	Suction pump	1
VIL	OG-12	A-051	Instrument set for delivery	2
VIL	OG-13	A-023	Doppler Ultrasound Fetal heart beat detector	1
RADIOLOGY				
VIL	RD-01	A-117	X-ray unit, mobile	1
VIL	RD-02	A-113	X-ray film viewer	1
VIL	RD-03	A-112	X-ray film cassette set	1
VIL	RD-04	A-114	X-ray processing tank	1
VIL	RD-05	A-118		1
DENTAL CLINIC				
VIL	DT-01	A-001	Amalgam mixer	1
VIL	DT-02	A-116	X-ray unit, dental	1
VIL	DT-03	A-018	Dental mastoid drill unit	2
VIL	DT-04	A-020	Dental unit	1
VIL	DT-05	A-007	Autoclave, small	1
VIL	DT-06	A-039	Film developer, dental	1
OPHTHALMOLOGY				
VIL	OT-01	A-094	Slit lamp with tonometer	1
VIL	OT-02	A-033	Examination chair, ophthalmology	1
VIL	OT-03	A-104	Trial lens, adult	1
VIL	OT-04	A-105	Trial lens, child	1
VIL	OT-05	A-090	Retinoscope	1
VIL	OT-06	A-084	Pen light	1
VIL	OT-07	A-075	Ophthalmic loupe	1

Equipment Delivery List

Appendices-9

Delivery No.		Item No.	Description	Q'ty
VIL	OT-08	A-077	Ophthalmoscope, electrical	1
VIL	OT-09	A-076	Ophthalmoscope, battery	1
VIL	OT-10	A-078	Ophthalmoscope, indirect	1
VIL	OT-11	A-034	Examination light, mobile	1
VIL	OT-12	A-095	Snellen's chart, E-type	1
VIL	OT-13	A-089	Refractometer	1
EMERGENCY OBSTETRIC CARE				
VIL	EM-01	A-049	Instrument set for caesarean section	2
VIL	EM-02	A-002	Ambu bag set	1
VIL	EM-03	A-056	Instrument set for vaginal tears	2
VIL	EM-04	A-015	D & C set	2
EMERGENCY ROOM				
VIL	EM-06	A-029	Emergency cart	1
VIL	EM-07	A-050	Instrument set for cardiology and thoracic	2
PHYSIOTHERAPY				
VIL	PT-01	A-093	Shortwave therapy unit	1
VIL	PT-02	A-068	Muscle stimulator	1
VIL	PT-03	A-045	Infrared lamp	1
VIL	PT-04	A-106	Ultrasound therapy unit	1
VIL	PT-05	A-038	Exercise mat	1
VIL	PT-06	A-087	Puch up block set	1
VIL	PT-07	A-080	Parallel bars	1
VIL	PT-08	A-085	Physiotherapy unit, mobile	1
VIL	PT-09	A-037	Exercise bike	1
VIL	PT-10	A-103	Traction pulley	1
VIL	PT-11	A-110	Walk exercise step	1
VIL	PT-12	A-066	Medicine ball set	1
LABORATORY				
VIL	LB-01	A-026	Drying oven	1
VIL	LB-02	A-025	Drug refrigerator	1
VIL	LB-03	A-010	Blood cell counter	2
VIL	LB-04	A-101	Tally counter	2
VIL	LB-05	A-067	Microscope, binocular	3
VIL	LB-06	A-013	Centrifuge	2
VIL	LB-07	A-092	Shaker	1
VIL	LB-08	A-102	Timer	3
MISCELLANEOUS				
VIL	MS-01	A-040	Generator, 150KVA	1
ADDITIONAL ITEMS FOR FOUR HOSPITALS				
VIL	AD-01	A-060	Instruments, theater tracheotomy, extras	2

Equipment Delivery List

Appendices-9

Delivery No.	Item No.	Description	Q'ty	
BEU				
For Training				
BEU	TR-01	B-001	Function Generator	2
BEU	TR-02	B-002	Slidac	1
BEU	TR-03	B-003	Electronic training kit for digital	10
BEU	TR-04	B-004	BP monitor calibrating means	2
BEU	TR-05	B-005	Digital multimeter	1
BEU	TR-06	B-006	Electronic components for training	10
BEU	TR-07	B-007	Computer with UPS	3
BEU	TR-08	B-008	Printer	1
BEU	TR-09	B-011	Frequency counter	1
BEU	TR-10	B-012	Sound level measurement	1
BEU	TR-11	B-013	pH meter	2
BEU	TR-12	B-014	Hand held Digital Oscilloscope	3
BEU	TR-13	B-015	Light Intensity measuring meter	1
BEU	TR-14	B-016	Flow measuring meter (Digital)	1
BEU	TR-15	B-017	Aneroid Barometer	2
For Testing and calibrating				
BEU	TC-01	B-018	X-ray meters, Multi-parameter	1
BEU	TC-02	B-019	Ventilator calibrator	1
BEU	TC-03	B-020	Safety analyzer	1
BEU	TC-04	B-021	ECG simulator	1
BEU	TC-05	B-022	Microprocessor training kit	5
BEU	TC-06	B-023	Defibrillator energy testing analyzer	1
BEU	TC-07	B-025	Laser protective glass	2
BEU	TC-08	B-026	Radiation detector X-ray	1
BEU	TC-09	B-027	IC remover	2
BEU	TC-10	B-028	Low ohm meter	2
BEU	TC-11	B-029	Electrician's tool kit	4
BEU	TC-12	B-030	Electronic service tool	13
BEU	TC-13	B-031	PC service kit	2
BEU	TC-14	B-032	Mechanic's tool kit	2
For both repair and training materials				
BEU	RT-01	B-035	Optical tachometer	2
BEU	RT-02	B-036	Stethoscope for machine inspection	2
BEU	RT-03	B-037	Micro tech tool set	6
BEU	RT-04	B-038	L shaped Torx drivers sets,	6
BEU	RT-05	B-039	Three stage hot air gun	3
BEU	RT-06	B-040	Service engineer's vacuum cleaners	4
BEU	RT-07	B-041	Socket wrench set	6
BEU	RT-08	B-042	Bench magnifiers with light	5
BEU	RT-09	B-043	Altimeter	2
BEU	RT-10	B-044	Scientific calculator	4
BEU	RT-11	B-045	Magnetic screw driver kit long handle	4
BEU	RT-12	B-046	Precision soldering iron with fine tips	5

Equipment Delivery List

Appendices-9

Delivery No.		Item No.	Description	Q'ty
BEU	RT-13	B-047	D.C. power supply	2
For Tools and Instruments				
BEU	TL-01	B-048	Battery charger (12V, 24V), variable current	2
BEU	TL-02	B-049	Hydrometer	2
BEU	TL-03	B-050	Oscilloscope 100Mhz	2
BEU	TL-04	B-051	Antistatic pad with strap	2
For Various Section				
BEU	MS-01	B-052	Digital multimeter	2
BEU	MS-02	B-053	Digital clamp meter	2
For wood work				
BEU	WD-01	B-060	Wood work tool sets	1
For plumber				
BEU	PL-01	B-061	Plumber tool sets	1

Appendices-10 Operation and Maintenance Cost for Equipment

Operation and Maintenance Cost for the Equipment

Item No.	Description	Q'ty	Unit	Basis for Calculation of Q'ty	Total (Nkf)	Total (Nkf)	Halibet Hospital		Agordat Hospital		Massawa Hospital		Villagio Ginio Hospital		BEU		Grand Total		
							Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	
A-001	Amalgam mixer																		
	Amalgam	13	pack	260persons / year x 10 / 200g = 13packs	1,850	24,047			1	24,047	1	24,047	1	24,047				3	72,140
	Mixing capsule	24	pack	520persons / year ÷ 22=23.6	57	1,364			1	1,364	1	1,364	1	1,364				3	4,091
A-003	Anesthesia machine, A																		
	CO2 absorber tablets	9	pack	260days x 3hours x 0.05kg / hours = 39kg, 39kg÷4.5 = 8.67	972	8,750	3	26,250										3	26,250
	Tube set	2	set	Change 2 sets a year	2,273	4,545	3	13,636										3	13,636
	Anesthesia mask set	2	set	Change 2 sets a year	3,699	7,399	3	22,197										3	22,197
	Medical gas	121	piece	260days / year x 3hours = 780hours, 780 x 39ml / hour=30420ml, 30420÷250ml / pieces = 121pieces	1,578	190,972	3	572,917										3	572,917
A-004	Anesthesia machine, B																		
	CO2 absorber tablets	9	pack	260days x 3hours x 0.05kg / hour = 39kg, 39kg÷4.5 = 8.67	972	8,750							2	17,500				2	17,500
	Tube set	2	set	Change 2 sets a year	2,273	4,545							2	9,091				2	9,091
	Anesthesia mask set	2	set	Change 2 sets a year	3,699	7,399							2	14,798				2	14,798
	Medical gas	40	piece	260days / year x 1hours = 260hours, 260 x 39ml/hour=10140ml, 10140÷250ml / pieces = 40pieces	1,578	63,131							2	126,263				2	126,263
A-004	Anesthesia machine, B																		
	CO2 absorber tablets	9	pack	260days x 3hours x 0.05kg / hour = 39kg, 39kg÷4.5 = 8.67	972	8,750			1	8,750								1	8,750
	Tube set	2	set	Change 2 sets a year	2,273	4,545			1	4,545								1	4,545
	Anesthesia mask set	2	set	Change 2 sets a year	3,699	7,399			1	7,399								1	7,399
	Medical gas	40	piece	260days / year x 1hour = 260hours, 260 x 39ml / hour=10140ml, 10140÷250ml/pieces = 40pieces	1,578	63,131			1	63,131								1	63,131
A-006	Autoclave, large																		
	Recording paper	8	roll	3times / day x 260days x 1 ÷ 100times / roll = 7.8	568	4,545							1	4,545				1	4,545
	Pre-filter	3	piece	Change 3 times a year	2,146	6,439							1	6,439				1	6,439
	Salt	390	kg	0.5times /day x 260day x 3kg = 390kg	25	9,848							1	9,848				1	9,848
A-009	Automatic film developer																		
	Developer solution	19	piece	15L / times x 2times / month x 12=360L, 360L÷19=18.94	1,894	35,985	1	35,985										1	35,985
	Fixer solution	19	piece	15L / times x 2times / month x 12=360L, 360L÷19=18.94	1,263	23,990	1	23,990										1	23,990
A-012	Cautery unit																		
	Electrode set	2	set	Change 2 sets a year	2,273	4,545	6	27,273	1	4,545	2	9,091						9	40,909
A-012	Cautery unit																		
	Electrode set	2	set	Change 2 sets a year	2,273	4,545							2	9,091				2	9,091
A-016	Defibrillator																		
	Gel	5	piece	360days x 0.06persons / days x 20g / persons = 430g, 430g÷100g = 430	126	631			1	631	2	1,263						3	1,894
	Electrode set	1	set	360days x 0.06persons / days x 3pieces / persons = 65pieces, 65pieces÷150pieces = 0.43	1,894	1,894			1	1,894	2	3,788						3	5,682
	Recording paper	1	piece	360days x 0.06persons / days x 1m / persons = 22m, 22m÷30m = 0.7	126	126			1	126	2	253						3	379
A-016	Defibrillator																		
	Gel	5	piece	360days x 0.06persons / days x 20g / persons = 430g, 430g÷100g = 430	126	631	1	631										1	631
	Electrode set	1	set	360days x 0.06persons / days x 3pieces / persons = 65pieces, 65pieces÷150pieces = 0.43	1,894	1,894	1	1,894										1	1,894
	Recording paper	1	piece	360days x 0.06persons / days x 1m / persons = 22m, 22m÷30m = 0.7	126	126	1	126										1	126
A-019	Dental scaler																		
	Tip set	2	set	Change twice a year	2,727	5,455	1	5,455										1	5,455
A-022	Doppler machine																		
	Gel	16	piece	758persons / year X 5ml / time÷250ml = 15.16	158	2,525	2	5,051										2	5,051
A-023	Doppler Ultrasound Fetal heart beat detector																		
	Gel	20	piece	965persons / year X 5ml / time÷250ml = 19.3	158	3,157					1	3,157	1	3,157				2	6,313
A-024	Drill, electrical																		
	Blade, Drill, Wire set	1	set	Change once a year	33,573	33,573	1	33,573										1	33,573
A-027	ECG																		
	Chest electrode set	1	set	Change 1 set a year	455	455			1	455	1	455						2	909
	Limb electrode set	1	set	Change 1 set a year	758	758			1	758	1	758						2	1,515
	Recording paper	10	roll	500persons / year x 0.4m / time÷20m = 10rolls	38	379			1	379	1	379						2	758
	ECG cream	15	piece	500persons / year x 3g / time÷100g = 15pieces	114	1,705			1	1,705	1	1,705						2	3,409
A-028	Electrical dermatome																		
	Blade	7	set	260days x 0.25persons / day = 65times, 65times÷10sheets = 6.5sets	1,793	12,551	1	12,551										1	12,551
	Skin carrier	7	set	260days x 0.25persons / day = 65times, 65times÷10sheets = 6.5sets	5,082	35,574	1	35,574										1	35,574
A-030	Endoscope set for lower digestive organs																		
	Xenon bulb	1	piece	Change once a year	18,939	18,939	1	18,939										1	18,939
A-031	Endoscope set for upper digestive organs																		
	Xenon bulb	1	piece	Change once a year	16,919	16,919	1	16,919										1	16,919
A-032	Endoscope set, ENT																		
	Harogen bulb	1	piece	Change once a year	884	884	1	884										1	884
A-033	Examination chair, ophthalmology																		
	Bulb for chart projector	3	piece	Change 3 times a year	487	1,462			1	1,462	1	1,462	1	1,462				3	4,386

Operation and Maintenance Cost for the Equipment

Item No.	Description	Q'ty	Unit	Basis for Calculation of Q'ty	Total (Nkf)	Total (Nkf)	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU	Grand Total			
A-034	Examination light, mobile														
	Harogen bulb	1	piece	The life is 1000hours, 260days x 3hours / days = 780hours	606	606		3	1,818	2	1,212	5	3,030		
A-034	Examination light, mobile														
	Harogen bulb	1	piece	The life is 1000hours, 260days x 3hours / days = 780hours	606	606		1	606	1	606	8	4,848		
A-039	Film developer, dental														
	Developer solution	2	piece	1.5L/timesx2times/monthx12months = 36L 36L÷30 = 1.2piece	542	1,083		1	1,083	1	1,083	1	1,083		
	Fixer solution	2	piece	1.5L/timesx2times/monthx12months = 36L 36L÷30 = 1.2piece	564	1,129		1	1,129	1	1,129	1	1,129		
A-040	Generator, 150KVA														
	Diesel fuel			75 of operation for 2hours / day (fuel consumption: 31.5L / hour) x 260days / year = 16380L, 16380 x 18Nfa = 294840Nfa		294,840						1	294,840		
	Oil filter	1	piece	Change once a year	53	53						1	53		
	Fuel filter	1	piece	Change once a year	52	52						1	52		
	Air filter	1	piece	Change once a year	4,400	4,400						1	4,400		
A-041	Gypsum cutter, electrical														
	Saw disc blade	1	piece	Change once a year	884	884		1	884	1	884		2	1,768	
A-043	Infant incubator														
	Micro filter	3	piece	Change 3 times a year	112	336		2	673	2	673	2	673		
	Iris access port cover	1	set	Change once a year	1,010	1,010		2	2,020	2	2,020	2	2,020		
A-044	Infant warmer														
	Illumination lamp	2	piece	260days / year x 12hours÷2000hours = 1.56	379	758		2	1,515			2	1,515		
	Skin temperature probe	6	box	260days/yearx2persons/days = 520sheets 520÷100 = 5.2box	2,020	12,121		2	24,242			2	24,242		
A-045	Infrared lamp														
	Lamp	1	piece	Change once a year	1,263	1,263		1	1,263			1	1,263		
A-046	Infusion pump														
	Infusion tube set for adult	260	set	260persons / year	8	2,199				1	2,199		1	2,199	
	Infusion tube set for child	130	set	130persons / year	10	1,280				1	1,280		1	1,280	
A-046	Infusion pump														
	Infusion tube set for adult	260	set	260persons/year	8	2,199		1	2,199				1	2,199	
	Infusion tube set for child	130	set	130persons/year	10	1,280		1	1,280				1	1,280	
A-062	Laryngoscope set, Mackintosh														
	Lamp	3	piece	Change 3 times a year	455	1,364		2	2,727				2	2,727	
A-062	Laryngoscope set, Mackintosh														
	Lamp	3	piece	Change 3 times a year	455	1,364						2	2,727		
A-064	Lung function tester														
	Paper mouthpiece	260	piece	260persons / year	3	722				1	722		1	722	
	Printer paper	4	roll	260persons / year x 0.3 / 20m = 3.9	76	303				1	303		1	303	
A-067	Microscope, binocular														
	Halogen bulb	3	piece	Change 3 times a year	505	1,515	3	4,545	1	1,515			4	6,061	
	Immersion oil, 8cc	1	piece	Change once a year	202	202	3	606	1	202			4	808	
A-067	Microscope, binocular														
	Halogen bulb	3	piece	Change 3 times a year	505	1,515						3	4,545		
	Immersion oil, 8cc	1	piece	Change once a year	202	202						3	606		
A-068	Muscle stimulator														
	Electrode (3 sizes)	1	piece	Change once a year	6,692	6,692		1	6,692			1	6,692		
	Electrode cable	1	piece	Change once a year	177	177		1	177			1	177		
	Electrode pad	1	piece	Change once a year	19,192	19,192		1	19,192			1	19,192		
A-069	Operation light, mobile														
	Halogen bulb	4	piece	The life is 1000hours, 260days x 3hours / days = 780hours, 780÷1000hours x 4times = 3.12	1,389	5,556	3	16,667	4	22,222	2	11,111		9	50,000
	Control handle	1	piece	Change once a year	1,073	1,073	3	3,220	4	4,293	2	2,146		9	9,659
A-069	Operation light, mobile														
	Halogen bulb	4	piece	The life is 1000hours, 260days x 3hours / days = 780hours, 780÷1000hours x 4times = 3.12	1,389	5,556						2	11,111		
	Control handle	1	piece	Change once a year	1,073	1,073						2	2,146		
A-070	Operation microscope														
	Halogen bulb	1	piece	Change once a year	492	492		1	492				1	492	
A-072	Operation table														
	Mattress	1	piece	Change once a year	5,303	5,303						2	10,606		
A-072	Operation table														
	Mattress	1	piece	Change once a year	5,303	5,303	2	10,606	2	10,606	2	10,606		6	31,818
A-073	Operation table, orthopedic														
	Mattress	1	piece	Change once a year	5,303	5,303	2	10,606					2	10,606	
A-074	Loupe, ENT														
	Lamp	3	piece	Change 3 times a year	574	1,723	1	1,723					1	1,723	

Operation and Maintenance Cost for the Equipment

Item No.	Description	Q'ty	Unit	Basis for Calculation of Q'ty	Total (Nkf)	Total (Nkf)	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU	Grand Total			
A-076	Ophthalmoscope, battery														
	Bulb for ophthalmoscope	2	piece	Change twice a year	417	833		2	1,667	2	1,667	1	833	5	4,167
	Battery	24	piece	Change 2 pieces every other month	25	606		2	1,212	2	1,212	1	606	5	3,030
A-077	Ophthalmoscope, electrical														
	Bulb for ophthalmoscope	2	piece	Change twice a year	556	1,111		1	1,111	1	1,111	1	1,111	3	3,333
A-078	Ophthalmoscope, indirect														
	Halogen bulb	2	piece	Change twice a year	592	1,184		1	1,184	1	1,184	1	1,184	3	3,553
A-081	Patient monitor, B														
	ECG electrode set	6	box	260persons / year x 3piece / persons = 780piece, 780÷150pieces = 5.2boxes	1,705	10,227	1	10,227						1	10,227
	Recording paper	7	roll	260persons/year x 1m/times = 260m 260m÷30m = 8.6	58	407	1	407						1	407
	ETCO2 adapter set	3	set	52persons / year = 52pieces, 52÷20pieces/set = 2.5sets	4,545	13,636	1	13,636						1	13,636
	IBP transducer	11	set	52persons / year = 52pieces, 52÷5pieces / set = 10.4sets	5,051	55,556	1	55,556						1	55,556
A-082	Patient monitor, A														
	ECG electrode set	6	box	260persons / year x 3piece / persons = 780piece, 780÷150pieces = 5.2boxes	1,705	10,227	1	10,227						1	10,227
	Recording paper	7	roll	260persons/year x 1m/times = 260m 260m÷30m = 8.6	58	407	1	407						1	407
A-082	Patient monitor, A														
	ECG electrode set	6	box	260persons/year x 3piece/persons = 780piece 780÷150piece = 5.2box	1,705	10,227		1	10,227	1	10,227			2	20,455
	Recording paper	7	roll	260persons / year x 1m / times = 260m, 260m÷30m = 8.6	58	407		1	407	1	407			2	813
A-084	Pen light														
	Battery	4	piece	Change 4 times a year	38	152		1	152	1	152	1	152	3	455
	Lamp	1	piece	Change once a year	139	139		1	139	1	139	1	139	3	417
A-088	Pulse oxymeter														
	Finger probe for adult (re-usable)	2	piece	Change twice a year	3,111	6,222	1	6,222	1	6,222	3	18,667		5	31,111
	Probe for neonate (re-usable)	2	piece	Change twice a year	3,111	6,222	1	6,222	1	6,222	3	18,667		5	31,111
A-089	Refractometer														
	Printer paper	4	roll	351persons / year x 0.2 / 20m = 3.51	101	404		1	404	1	404	1	404	3	1,212
A-090	Retinoscope														
	Lamp	4	piece	Change 4 times a year	164	657		1	657	1	657	1	657	3	1,970
A-094	Slit lamp with tonometer														
	Halogen bulb	2	piece	Change twice a year	19	38		1	38			1	38	2	76
A-099	Suction pump														
	Suction bottle with cap	1	set	Change 1 set a year	4,545	4,545		1	4,545			3	13,636	4	18,182
A-099	Suction pump														
	Suction bottle with cap	1	set	Change 1 set a year	4,545	4,545	2	9,091	2	9,091	3	13,636		7	31,818
A-100	Suction pump, small														
	Suction bottle	1	piece	Change once a year	694	694	1	694	1	694	1	694		3	2,083
	Suction tube with connecting tube	1	set	Change 1 set a year	505	505	1	505	1	505	1	505		3	1,515
A-106	Ultrasound therapy unit														
	Gel	11	piece	520persons / year x 5ml / 250ml = 10.4	253	2,778		1	2,778			1	2,778	2	5,556
A-107	Ultrasound unit, color doppler														
	Gel	14	piece	670persons / year X 5ml / times÷250ml = 13.4	158	2,210	1	2,210						1	2,210
	Color printer paper	4	box	670persons / year÷200sheets / box = 3.35box	1,263	5,051	1	5,051						1	5,051
A-108	Ultrasound unit, B/W														
	Recording paper	5	roll	747persons / year X 0.2m / times÷30m = 4.98	1,010	5,051				1	5,051			1	5,051
	Gel	15	piece	747persons / year X 5ml / times÷250ml = 14.94	421	6,313				1	6,313			1	6,313
A-108	Ultrasound unit, B/W														
	Recording paper	5	roll	747persons / year X 0.2m / times÷30m = 4.98	1,010	5,051		1	5,051			1	5,051	2	10,101
	Gel	15	piece	747persons / year X 5ml / times÷250ml = 14.94	421	6,313		1	6,313			1	6,313	2	12,625
A-109	Vacuum extractor														
	Suction bottle	1	set	Change once a year	3,030	3,030		1	3,030	1	3,030	1	3,030	3	9,091
A-113	X-ray film viewer														
	Fluorescent lamp	3	set	Change 3 times a year	631	1,894						1	1,894	1	1,894
A-113	X-ray film viewer														
	Fluorescent lamp	3	set	Change 3 times a year	631	1,894		1	1,894					1	1,894
A-114	X-ray processing tank														
	Developer solution	19	piece	15L / times x 2times / month x 12=360L, 360L÷19=18.94	1,894	35,985		1	35,985					1	35,985
	Fixer solution	19	piece	15L / times x 2times / month x 12=360L, 360L÷19=18.94	1,263	23,990		1	23,990					1	23,990
A-114	X-ray processing tank														
	Developer solution	19	piece	15L / times x 2times / month x 12=360L, 360L÷19=18.94	1,894	35,985				1	35,985	1	35,985	2	71,970
	Fixer solution	19	piece	15L / times x 2times / month x 12=360L, 360L÷19=18.94	1,263	23,990				1	23,990	1	23,990	2	47,980
A-115	X-ray Unit, C-arm														
	X-ray film	20	box	260days / year x 5persons x 1.5sheets = 1950sheets, 1950÷100sheets / box = 19.5	2,525	50,505		1	50,505					1	50,505
A-116	X-ray Unit, dental														
	X-ray film	8	box	260days / year x 2persons x 1.5sheets = 780sheets, 780÷100sheets / box = 7.8	593	4,747		1	4,747					1	4,747

Operation and Maintenance Cost for the Equipment

Item No.	Description	Q'ty	Unit	Basis for Calculation of Q'ty	Total (Nkf)	Total (Nkf)	Halibet Hospital	Agordat Hospital	Massawa Hospital	Villagio Ginio Hospital	BEU	Grand Total				
A-116	X-ray Unit, dental															
	X-ray film	8	box	260days / year x 2persons x 1.5sheets = 780sheets, 780÷100sheets / box = 7.8	593	4,747			1	4,747	1	4,747	2	9,495		
A-117	X-ray Unit, mobile															
	X-ray film	40	box	260days / year x 10persons x 1.5sheets = 3900sheets, 3900÷100sheets / box = 39	2,525	101,010	1	101,010	1	101,010			2	202,020		
A-117	X-ray Unit, mobile															
	X-ray film	40	box	260days / year x 10persons x 1.5sheets = 3900sheets, 3900÷100sheets / box = 39	2,525	101,010				1	101,010		1	101,010		
B-001	Function Generator															
	Signal cable (BNC-Alligator clip)	1	piece	Change once a year	189	189					2	379	2	379		
	Signal cable (BNC-IC clip)	1	piece	Change once a year	189	189					2	379	2	379		
B-005	Digital multimeter															
	Dry cell batteries (9V)	40	piece	1set / 6months x 20pieces = 40pieces	189	7,576					1	7,576	1	7,576		
B-008	Printer															
	Toner cartridge	2	piece	1piece / 6months	505	1,010					1	1,010	1	1,010		
B-012	Sound level measurement															
	Dry cell batteries (1.5V)	3	set	1set / 4months	126	379					1	379	1	379		
B-013	pH meter															
	pH Calibration solution	2	piece	1piece / 6months	303	606					2	1,212	2	1,212		
	Dry cell batteries (LR44)	3	set	1set / 4months	606	1,818					2	3,636	2	3,636		
B-015	Light Intensity measuring meter															
	Dry cell batteries (1.5V)	3	set	1set / 4months	126	379					1	379	1	379		
B-016	Flow measuring meter (Digital)															
	Dry cell batteries (1.5V)	3	set	1set / 4months	126	379					1	379	1	379		
B-021	ECG simulator															
	Dry cell batteries (9V)	4	set	1set / 3months	189	758					1	758	1	758		
B-026	Radiation detector X-ray															
	Dry cell batteries (CR2450B)	4	set	1set / 3months	126	505					1	505	1	505		
B-035	Optical tachometer															
	Dry cell batteries (1.5V)	2	set	1set / 6months	505	1,010					2	2,020	2	2,020		
B-040	Service engineer's vacuum cleaners															
	Filter (Wet)	6	piece	1piece / 2months	455	2,727					4	10,909	4	10,909		
	Filter (Dry)	3	piece	1piece / 4months	2,210	6,629					4	26,515	4	26,515		
B-042	Bench magnifiers with light															
	Light	2	piece	1piece / 6months	126	253					5	1,263	5	1,263		
B-051	Antistatic pad with strap															
	Rist strap	1	piece	Change once a year	341	341					2	682	2	682		
	Conection cable for rist strap	1	piece	Change once a year	67	67					2	134	2	134		
	Clamp for antistatic pad	1	piece	Change once a year	227	227					2	455	2	455		
B-052	Digital multimeter															
	Test lead	1	piece	Change once a year	316	316					2	631	2	631		
	Spear fuse	1	piece	Change once a year	25	25					2	51	2	51		
B-053	Digital clamp meter															
	Test lead	1	piece	Change once a year	88	88					2	177	2	177		
	Dry cell batteries (R03)	3	set	1set /4months	126	379					2	758	2	758		
B-060	Wood work tool sets (Electric drill,Glass cutter,Files sets,Chisels sets,Saw, Planner)															
	Hammer head	1	piece	Change once a year	63	63					1	63	1	63		
	Glass cutter blade	2	set	1set / 6months	631	1,263					1	1,263	1	1,263		
B-061	Plumber tool sets															
	Hacksaw	3	set	1set / 4months	95	284					1	284	1	284		
Total of each facility																
								1,123,283		406,792		333,148		825,084		61,510
																2,393,467
																61,794
																294,840
																2,750,101

Appendices-11 Soft Component (Technical Assistance) Plan

Soft Component Plan

I. Background

1. Background of Medical Equipment

The Ministry of Health (MOH) has made a strong effort to restoration of health infrastructures devastated during the war against Ethiopia that started from 1998. Besides their enormous effort, many foreign countries or international organization have played an important role in donation of medical equipment. As a result, major health indicators in Eritrea began to exceed those of its neighboring countries.

Unfortunately, quite a lot of the medical equipment donated by those countries or organizations in those days were second handed, with some exceptions. Some of the donated equipment were already broken and did not function at all when they arrived at site. No maintenance manuals, no operation manuals were included in those equipment. This did not enhance the necessity of equipment management among the users. The users would not do the daily check-ups on equipment, repair and reuse it, more precisely, they just did not know how to manage and maintain the equipment. Scarcity of spare parts and unavailability of consumables made the equipment lie neglected.

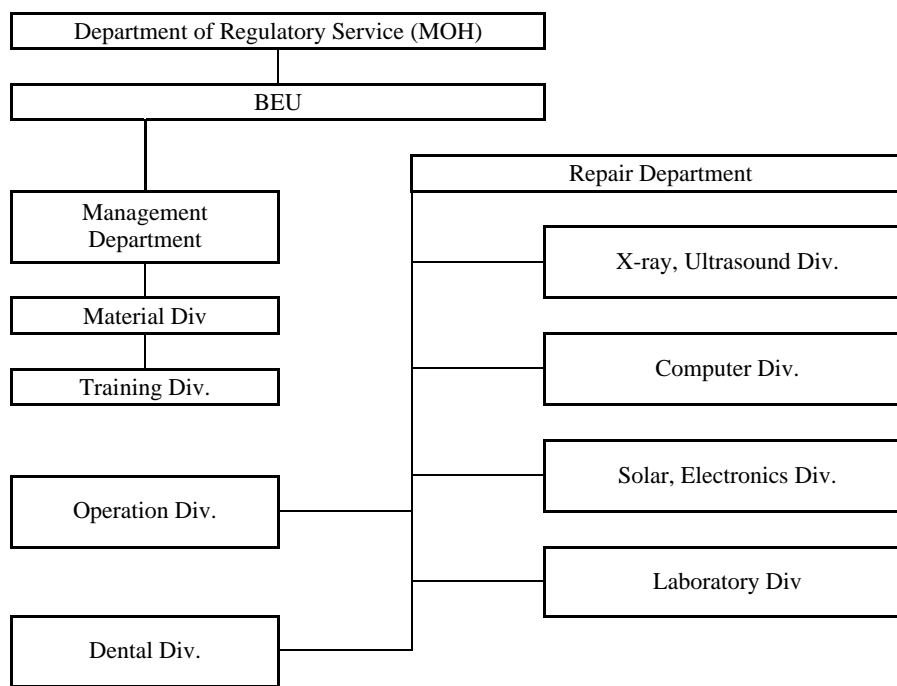
Facing those difficult challenges, the MOH drafted 10-year Strategic Plan for Health Sector Development, aiming at improvement of health service to be provided in Eritrea. Under the MOH, Biomedical Engineering Unit (BEU) and Pharmicor are working for realization of the Plan, in which BEU is responsible for maintenance of medical equipment, and Pharmicor is for procurement of medical equipment, spare parts, consumables and drugs. BEU, however, is facing a problem regarding aging facility and equipment, which forced BEU to be incapable of playing the role in the Plan.

2. Background of Maintenance System

During the colonial period by Ethiopia, General Workshop, predecessor of BEU, was created. At that time, their main work is to produce and repair simple medical furniture or equipment, such as bed, instrument cabinet, etc. Under the British rule, it transformed to Public Work Department (PWD), responsible for maintenance of almost all of the public facilities in Eritrea, except for medical equipment. After independence, it was placed under the control of the MOH, mainly responsible for maintenance work of medical equipment.

With the assistance from Italian Cooperation in 1997, maintenance equipment such as measuring instrument, tool, spare parts were procured. They use an old facility built as a print factory (the date of construction is unknown). It has two departments in itself, the Management Department and Maintenance Department. The Management Department has Training Division, in which training for new staff, instruction for new equipment, workshop, etc. are provided. There are also lecture hall and library in it.

The Maintenance Department was divided by each specialty. Headed by a director, with 17 medical equipment engineers, 2 refrigerator technicians, 2 electrical mechanical engineers, 1 metal work engineer, 1 plumber, 1 wood worker, total 30 staff, BEU is in charge of maintenance of procured medical equipment under the Project. The organization of BEU is illustrated below.



Organization of BEU

18 out of 30 BEU staff are either graduated from 4-year college or with 4-year technical education after graduation from high school. 6 of them have taken technical training in foreign countries. 17 of them have participated in a technical training provided by Italian Cooperation in Asmara. All of the new staff are supposed to take a training course provided by BEU for certain period of time before they start actual work. Therefore, their technical level is considered sufficient for handling equipment under the Project. It should be noted that BEU is the sole provider for maintenance training of medical equipment in Eritrea.

Upon request from health facilities, they dispatch staff to the site but often they bring the equipment back to BEU to repair, wherever required. Table below shows shift of repair work done by BEU as from 2003 to 2006. The total number of repair work gradually increases. They constantly repair such equipment as anesthesia machine or X-ray machine that are procured as a new machine. As the facilities get older, the demand of facility repair such as plumbing work increases.

Table Shift of Repair Work by BEU

	2003	2004	2005	2006
Anesthesia machine	30	24	36	40
Refrigerator, Freezer	31	35	33	25
X-ray machine	83	70	90	80
Ultrasound machine	2	6	9	11
Laboratory equipment	105	100	120	131
Plumbing work	120	122	135	250
Wood work	20	20	30	10
Others				
Total	391	377	453	547

As there are limited number of local agent of medical equipment manufacturers in Eritrea, procurement of

spare parts and consumables are done by Pharmicor in association with BEU. BEU has dealt with such equipment that were donated from foreign countries as a second hand and that had no operation manuals or maintenance manuals attached to it. For those equipment, procurement of spare parts and consumables were very difficult, which made them impossible to make a procurement plan of spare parts and consumables. Surrounded by this situation, even BEU staff did not recognize the importance of equipment register book, standardized format of maintenance work documents or method of preventive daily maintenance.

It is a one of the few occasions that certain quantity of medical equipment are procured under the Project. Thus, to take this opportunity, a request for technical assistance as a soft component of the Project was made by the MOH, so that a sense of preventive maintenance may be well understood by hospital staff through BEU and that procured equipment may be used effectively and for a long period of time.

II. Objectives

BEU will be able to make an equipment register book and standardized format for necessary maintenance work with computers, and, based on those book and format, be able to draft a procurement plan for spare parts and consumables.

BEU also will be able to organize a workshop for health facilities, in which BEU teach them how to conduct a preventive daily checkups, importance of equipment register book and how to use the format for maintenance work.

(1) Goals

Following goals are expected by implementation of the Soft Component.

- Equipment register books are made
- Standardized formats for necessary maintenance work are made
- Appropriate management system of maintenance is established
- Procurement plan for spare parts and consumables is periodically drafted
- Prompt and appropriate action is taken at breakdown of equipment
- Preventive maintenance is understood by hospital staff to use the procured equipment effectively and for a long period of time

(2) Confirmation methods of achieved goals

Following points shall be confirmed as to achievement of the goals

- Equipment register books were made
- Standardized formats for necessary maintenance work were made
- Appropriate management system of maintenance was established
- Workshop for health facilities was conducted and equipment daily maintenance sheets by major equipment were distributed to hospital staff
- Proficiency level of maintenance skill in health facilities was recorded for each facility

(3) Inputs

1) Activities

Activities to be input are divided into 2 sessions, Session 1 shall start prior to procurement and installation of equipment, and Session 2 shall start after completion of installation work. Target group is 30 staff that belongs to BEU.

Session 1

Explanation of the Project, confirmation of the person in charge at each division

Hand written equipment names kept in the existing register book are extracted, out of which equipment names necessary for computerized register book are selected, and the equipment names are standardized and confirmed

Examination on the category necessary for computerized equipment register book, assistance for preparation of it. As the books differ from one health facility to another, at least 1 day will be necessary to prepare the book.

Assistance for preparation of daily maintenance sheet and standardized format for maintenance work to be sent from health facilities to BEU, (Report of newly procured equipment, Report of abolished equipment, Repair request form, Repair status report, Completion report, Record of repair, Purchase request form, Record of purchased equipment, etc.) and assistance for preparation of instructions on the use of standardized format for hospital staff. Daily maintenance sheet includes the contents of regular inspection by BEU. Prior to preparation of daily maintenance sheet, target group study the purpose and defect of the current format, background, and frequency of use, and then discuss how to reflect them to the new standardized format.

Preparation of workshop plan for Session 2, including resume for progress of the workshop, and technical manuals on instructions of each equipment. Targeted equipment are 27 items, which includes the items listed in "Outline of Major Equipment," also includes Automatic film developer, X-ray unit dental, Film developer dental, Centrifuge, Drying oven, Distiller, Microscope binocular, and Shaker. In the future, targeted equipment shall be all the equipment hospital owns.

Session 1 shall be adjusted to complete almost as soon as the installation work finishes. After completion of the Session 1, Eritrean counter parts shall go out to the targeted hospitals and obtain necessary information such as equipment name, serial number, procurement date, manufacturer and agent information, etc. and input those data to register book. Information of the equipment other than those of the Project shall also be collected.

At the same time, daily maintenance sheet shall be distributed to hospital staff so that they may fill out the necessary data such as status of use, inspection, problems, etc. every day. Also the hospital staff shall be informed of other standardized format by the BEU staff as well.

As discussed above, it is necessary for the activity to be divided into 2 sessions so that problems peculiar to each site or regions may be extracted through collection of information conducted between the 2 sessions.

Session 2

Analysis of the daily maintenance sheet which was made in Session 1, and arrangement of the data to clear up the problems which each hospital and each region has, and to solve them in the workshop. Instruction to Eritrean counterparts on inputting the equipment information which are necessary for the daily maintenance sheet, such as serial number.

Instruction for the BEU staff to be able to conduct a workshop targeting doctors, nurses, maintenance staff at health facilities, using the daily maintenance sheet. Subject of the workshop shall be “Knowledge necessary to use medical equipment under the Project and method of daily checkup”. By this time, hospital staff shall have used the procured equipment for a few weeks, so the workshop shall aim at solving the problems peculiar to each site and region, which are extracted with the information filled out by the users. Thus, workshop shall take place at each targeted hospital separately.

Assistance in organizing the workshop, summarizing it.

Assistance in drafting a procurement plan for spare parts and consumables.

2) Scope of Works

Tentative scope of works amongst the Soft component (by Japanese consultant), the Supplier’s training (by Japanese supplier), and Project Type Technical cooperation shall be as follows.

Table. Scope of works

Inputs to	Activities	Inputs by		
		Supplier	Soft Com	Tec Coop
Users at health facilities	Instruction for use of equipment, simple routine checkups			
	Exacting and solving the problem peculiar to each site and regions			
	Introduction of Total Quality Management (TQM) for health facilities			
BEU	Instruction for use of BEU equipment, routine checkups			
	Introduction of Total Quality Management (TQM) for health facilities			
	Equipment register book, standardized format for maintenance work			
	Instruction for BEU staff to organize workshops at health facilities, to check technical competency of maintenance skill of hospital staff			
MOH	Establishment of medical equipment maintenance system at the national level			

(4) Procurement of Consultant

Procurement of local resources responsible for providing the activities as mentioned above is not possible. There are no Japanese or international NGOs working on this field in Eritrea, thus recommissioning the work to them is also impossible. Therefore, a resource to be input as a instructor shall be a Japanese technical consultant who has enough knowledge and experiences in the field of maintenance of medical equipment,

and who also has experiences of the instruction in an English speaking countries.

(5) Breakdown of Activities

Details and necessary days of activities mentioned in (5) shall be as follows.

		Activities
Session 1		Work in Japan (preparation)
		Explanation of the Project
		Assistance in extraction of equipment name and confirmation of them
		Assistance in drafting equipment register book, workshop plan
		Assistance in preparing daily maintenance sheet, other standardized formats
		Work in Japan (wrap ups)
Obtaining information and inputting them into equipment register book, distribution of daily maintenance sheet to hospital staff, collection of daily maintenance sheet by counterparts, explanation of standardized formats to hospital staff		
Session 2		Work in Japan (collecting manuals, catalogues)
		Assistance in daily maintenance sheet (continued)
		Instruction for organizing workshops
		Workshop No.1 (Halibet and Villagio Ginio)
		Workshop No.2 (Agordat)
		Workshop No.3 (Massawa)
		Assistance in drafting a procurement plan for spare parts and consumables
		Work in Japan (preparation of reports)

(6) Outputs

- Equipment register book
- Standardized formats (Report of newly procured equipment, Report of abolished equipment, Repair request form, Repair status report, Repair completion report)
- Workshop progress report
- Daily maintenance sheet
- Soft components progress report
- Completion report of soft component

(7) Obligations of the Eritrean side

Documents, books or formats elaborated during the Soft component period might need to be modified wherever necessary to cope with the new circumstances, which is a responsibility of BEU. BEU also should from time to time continue renewing such data as newly procured or abolished equipment so that the procurement plan for spare parts and consumables may always be up to date.

It is also a responsibility of BEU to organize workshop whenever necessary to keep the technical level of hospital staff and check their skills

1 . Schedule

Work in Japan
Work in third country
Work in Eritrea

Contract	Year	2007												2008											
		Fiscal year (Japan)												Fiscal year (Japan)											
		Calendar month												Calendar month											
		7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12						
Detail design	Exchange of Notes																								
	Consultant Agreement																								
	Site survey																								
	Examination in Japan, Detail design																								
	Preparation of Tender Documents																								
	Approval of Tender Documents																								
	Announcement of Tender																								
	Distribution of Tender Documents																								
	Tender																								
	Tender Evaluation																								
	Supply Contract																								
	Equipment Ordering																								
	Preparation of Drawing of Equipment																								
	Equipment Production																								
	Procurement / Installation	Pre-meeting (Consultant and Eritrean side)																							
Factory inspection																									
Pre-packing inspection																									
Pre-shipment inspection																									
Shipping																									
Transportation of Equipment																									
Unpacking, Receiving, Installation work																									
Test Operation, Commissioning																									
Instruction of Operator																									
Final inspection, Handing over																									
Category																									
Equipment Maintenance Management		Work in Japan (preparation)																							
		Explanation of the Project, Confirmation of persons in charge in BEU																							
		Assistance in selection of equipment, standardizing the name																							
		Assistance in preparation of equipment register book																							
	Assistance in preparation of daily maintenance sheet, standardized formats																								
	Work in Japan (preparation)																								
	Description of Work																								
	Work in Japan (data collection)																								
	Preparation of daily maintenance sheet (continued)																								
	Instruction for Workshop																								
	Workshop No.1 (Halibet)																								
	Workshop No.2 (Villagio Giniio)																								
	Workshop No.3 (Agordat)																								
	Workshop No.4 (Massawa)																								
	Assistance in preparation of procurement plan for spare parts and consumables																								
Work in Japan (Preparation of report)																									

Appendices-12 References

References

Basic Study Report on the Project for Improvement of Regional Health in State of Eritrea

No.	Title	Form	Original or Copy	Source	Date of Issue
1	Implementation Completion Report on a Credit in the Amount of SDR 13.4 million to the State of ERITREA for a Health Project	Book	Original	World Bank	June, 2005
2	Primary Health Care Policy and Policy Guidelines	Book	Original	State of Eritrea, Ministry of Health	September, 1998
3	Building Effective Referral System	Book	Original	State of Eritrea, Ministry of Health	November, 2004
4	Integrated Disease Surveillance & Response/Expanded Program of Immunization Bulletin	Book	Original	WHO	September, 2006
5	Five years 2006-2011 Training plan for the College of Nursing and Health Technology	Document & Floppy Disc	Copy	-	2006
6	Annual Report 2005	Book	Original	National Insurance Corporation of Eritrea Share Company	2005
7	National Health-Care Waste Management Plan Preliminary Report	Book	Original	State of Eritrea Ministry of Health	March, 2003
8	Report of the Contribution of Partner Agencies to the Ministry of Health in 2006	Document	Copy	Ministry of Health	N/A
9	Ten Years Health Sector Strategic Plan	Document	Copy	Ministry of Health	N/A
10	An Overview of the Health Sector Medium Term Objectives and Strategies	Document	Copy	Ministry of Health	N/A
11	The Infrastructural and Human Resources Arrangements of the Project Areas (Present and Near Future Plan of the Ministry of Health)	Document	Copy	Ministry of Health	January, 2007
12	Health Bulletin	Book	Original	Ministry of Health	September, 2005