No.

The Kingdom of Cambodia
The Cambodia Mine Action Center

BASIC DESIGN STUDY REPORT

ON

THE PROJECT FOR

IMPROVEMENT OF EQUIPMENT FOR DEMINING ACTIVITIES (PHASE V)

IN

THE KINGDOM OF CAMBODIA

FEBRUARY 2009

JAPAN INTERNATIONAL COOPERATION AGENCY

INGÉROSEC CORPORATION

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PREFACE

In response to a request from the Government of the Kingdom of Cambodia, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Equipment for Demining Activities (Phase V) in the Kingdom of Cambodia and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Cambodia a study team from August 21 to September 23, 2008.

The team held discussions with the officials concerned of the Government of Cambodia, 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 Cambodia in order to discuss a draft basic design, and as this result, the present report was finalized.

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

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

February 2009

Eiji Hashimoto
Vice-President
Japan International Cooperation Agency

February 2009

LETTER OF TRANSMITTAL

We are pleased to submit to you the basic design study report on the Project for Improvement of Equipment for Demining Activities (Phase V) in the Kingdom of Cambodia.

This study was conducted by the INGÉROSEC Corporation, under a contract to JICA, during the period from July 2008 to February 2009. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Cambodia 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,

Yukio Kousaka
Project manager,
Basic design study team on the Project for Improvement of Equipment for Demining Activities (Phase V) in the Kingdom of Cambodia
The INGÉROSEC Corporation

SUMMARY

SUMMARY

1. Country Profile

The Kingdom of Cambodia (hereinasfter referred to as “Cambodia”) is located slightly southwest from the center of Indochina, and shares its borders with Thailand in the north and the west, Laos in the north, and Vietnam in the southeast. Cambodia has a total area of 181,035km^2, almost half the land area of Japan and one third (1/3) that of Thailand, strecheing approximately 560km from east to west and 440km from north to south. The population of Cambodia is approxiamtely 14.4 million (2007). The urban population, including that of the capital Phnom Penh is only 19.7% (2005, UNESCO), and approxiamtely 80% of its people reside in rural areas.

The Mekong River flows from north to south on the eastern side of the central plain, and the Tonle Sap (Great Lake) is located on its western side. Due to its tropical monsoon climate, the year can be roughly divided into rainy and dry seasons. Moreover, the dry seasons can be further divided into summer heat (from the beginning of Feburary to the middle of May) and cool heat (from the beginning of November to the end of January).

With a GDP of $7.26 billion US and per capita GNI at only $490 US (2006, World Bank), its economic position is still lower than that of its neighbors. However, stable economic growth contines along with a relatively low unemployment rate of 1.8% (1996 to 2005, UNDP).

With respect to land utilization, since cultivated land and forest zones account for most of Cambodia’s national territory, its primary industries are agriculture, fisheries and forestry. In particlar, agriculture accounts for approximately 30% of its GDP and 70% of the employed workforce (1996 to 2005, UNDP). Primary, secondary and tertiary industries account for 30%, 26% and 44% respectively of GDP (2006, World Bank).

2. Background, Details and Outline of the Requested Project

(1) Overall Plan

Despite a lapse of nearly 20 years since the end of the civil war, it is estimated that 4 to 6 million mines still remain buried in Cambodia and it is expected to take a hundred years to complete the demining and clearing process. Consequently, securing the safety of a people through demining, encouraging their return and resettlement, and providing landmine victim assistance are recognized to be urgent issues in the nation’s socio-economic development.

Faced with such conditions, in 2003 Cambodia introduced the National Mine Action Strategic Plan with the objective of reaching "Zero Victims" by the year 2012 and becoming "Impact Free" by the year 2015. The same objectives are also incorporated in the National Strategic Development Plan which was formulated in 2004, and demining and clearance activities are considered to be one of its important policies. In 1992, the Cambodia Mine Action Center (herein referred to as "CMAC") was established under the guidance of the United Nations Development Program (UNDP) and the Five-Year Strategic Plan (2008 to 2012) is currently being formulated.

(2) Present Conditions and Problems with the Competent Sector

With respect to areas contaminated with landmines and unexploded ordinances (UXO), 4,466km^2 is a commonly recognized area according to the Level One Survey (L1S: National Landmine Impact Survey) as of the year 2002. In total, approximately 412km^2 of Cambodia has been cleared of mines until now (1992 to 2007), of which approximately 200km^2 (only slightly less than 5% of the target contaminated area) was completed by the CMAC. The number of mine casualties fell sharply from 1,154 persons in 1999 to 347 persons in 2007, and 2008 figures indicate a still downward trend. Moreover, the number of victims from anti-personnel mines also shows a sharp decline. On the other hand, the ratio of casualties resulting from UXO or ammunitions left in battlefields has grown. However, the area of mine clearance is not more than 10%, and demining is still no less urgent a task for this country. Most mining operations depend greatly on equipment, and as the result of Japanese assistance, almost half of all major equipment presently utilized has been procured through Japanese Grant Aid. Due to such assistance from an equipment aspect, the annual area of mine clearance has more than doubled thus contributing to a dramatic improvement in demining work efficiency.

As the equipment becomes severely damaged due to intensive use and its service life is gradually reached and machinery becomes deteriorated, work efficiency will almost certainly drop under the present situation. Although it is necessary to maintain and repair worn out equipment and continuously renew deteriorating equipment in order to maintain the accuracy and efficiency of demining operations, since the independent budget of the CMAC is still inadequate, and the majority of aid from UN organizations and bilateral donors is invested toward the operating cost for demining activities, the renewal of required equipment remains a challenge.

Faced with these circumstances, the Royal Government of Cambodia (hereinafter referred to as "Government of Cambodia") submitted a request to the Government of Japan for Grand Aid in order to procure demining equipment such as mine and UXO detectors necessary to accomplish the mine clearance plan.

The requested components confirmed at the time of the Basic Design include nine (9) items: mine detectors, mine and UXO detectors, communication equipment (handheld VHF), personal protective equipment (PPE vests), personal protective equipment (PPE visors), GPS, spare parts (brush cutters, mine detectors, mine and UXO detectors), mobile workshop (for brush cutters and vehicles) and servicing equipment for the CMAC Central Workshop.

3. Outline of the Study Findings and Project Components

The Government of Japan decided to carry out a Basic Design Study and the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team to Cambodia from August 21 to September 23, 2008. The Study Team held discussions with concerned parties from the Government of Cambodia. At the same time it conducted a proposed site survey and collected related materials. After returning to Japan, the Study Team prepared a draft Basic Design Report based on the findings of the field survey by inspecting the relevance of, and by formulating an implementation plan for the Project. JICA dispatched the Study Team in order to explain to Cambodia the draft Basic Design Report with respect to the basic components of the draft final report and to obtain the consent of the Cambodian Government.

The scope of the requested Japanese assistance includes the procuring of equipment necessary for accomplishing the demining activities program scheduled by the Government of Cambodia. The CMAC's demining activities program during the implementation period on the recipient's side is shown in Table 1. With respect to equipment necessary for the Government of Cambodia's implementation of the Mine Action Plan, the types and specifications of equipment to be procured and the number of units were selected and determined after considering the capacity of the implementing agency on the recipient side to carry out operations and maintenance, and its competency to implement the Project and condition of equipment owned. The relevance of requested assistance was examined and an equipment plan was prepared. The plan is outlined in Table 2.

Table 1 Demining Action Plan (New Five-Year Strategic Plan: 2008 to 2012)

(km^2)

FY	*2007	2008	2009	2010	2011	2012
Annual Cleared Area	*27	33.8	38.4	48	54	54

*: The 2007 annual cleared area (actual results) is indicated for reference.
Source: CMAC

Table 2 Equipment Plan Overview

No.	Equipment Name	Major Specifications	Requested Quantity (At signing M/D)	Planed Quantity	Intended Purpose, etc.
1	Mine Detector	Type: MINELAB F3, total length at operation time: not more than 80cm (shortest) to not less than 146cm (longest), operating weight: not more than 3.5kg, transmission: multi period sensing, water proofing: IP67, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard	300 to 400	388	Detection of metals and landmines
2	Mine Detector	Type: CEIA MIL-D1, search head adjustment length: not more than 45cm (shortest) to not less than 157cm (longest), operating weight: not less than 4.0km, protection: IP68, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard	100	100	▪ Detection of metals and landmines. ▪ Utilized for magnetic laterite soil
3	Mine/UXO Detector	Type: EBINGER UPEX 740M, total length x total width: not more than 245cm x145cm, operating weight: not more than 6.0kg, transmission: pulse induction, waterproofing: splash proofing, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	24 to 77	27	▪ Detection of landmines and UXO buried deeply ▪ Detection of a wide area with two-man team
4	Mine/UXO Detector	Type: CEIA MIL-D1/DS, operating bar expansion length: not less than 155cm, operating weight: not more than 6.0kg, protection: IP68, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	14 to 47	14	▪ Detection of landmines and UXO buried deeply ▪ Detection even for narrow area used by one person
5	Mine/UXO Detector	Type: FOERSTER GROUP FEREX 4.032 DLG “Data Logger Standard”, carrying tube: total length not less than 610mm diameter 32mmφ, operating weight: not more than 5.0kg, waterproofing: IP57, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	3 to 6	3	▪ Detection of landmines and UXO buried deeply ▪ Detection of places with a lot of water or with deep water
6	PPE (Vest)	Quality: CMAC standard	1000	-	To be procured in the CMAC’s operation of the Project and to be excluded from the procured equipment
7	Spare Parts	▪ Parts for rotary cutters and suspension of brush cutters ▪ Parts for owned mine detector of type MINELAB F1A4 and parts for mine/UXO detector of types MINELAB F1A4 UXO and EBINGER UPEX 740M	1 set	1 set	▪ Improving efficiency of brush cutters ▪ Maintaining work efficiency of equipment owned by CMAC
8	Mobile Workshop (for brush cutters)	Permissible maximum vehicle weight: not less than 10t, engine: diesel engine, engine horsepower: not less than 140kw, driving type: 4x4, crane capacity: not less than 2.9t, carrier type: aluminum van type, monorail crane capacity: not less than 240kg, mounting: accessories: one set	1	1	Substantiating onsite repair of brush cutters by patrolling each site

No.	Equipment Name	Major Specifications	Requested Quantity (At signing M/D)	Planed Quantity	Intended Purpose, etc.
9	Mobile Workshop (for vehicles)	Permissible maximum vehicle weight: not less than 5.5t, engine: diesel engine, engine horsepower: not less than 75kw, driving type: 4x4, carrier type: aluminum van type, mounting: accessories: one set	1	-	Substantiating onsite repair of vehicles by patrolling each site
	Loaded Tools for Vehicle Repair (for vehicles)	One set of vehicle-loaded mechanical tools	-	1 set	Substantiating onsite repair of vehicles by loading tools on vehicle presently owned by mechanic
10	PPE (Visor)	Quality: CMAC standard	1500	-	To be procured in the CMAC's operation of the Project and to be excluded from the procured equipment
11	GPS	Handheld	50	-	To be procured in the CMAC's operation of the Project and to be excluded from the procured equipment
12	VHF	Handheld	100	-	To be procured in the CMAC's operation of the Project and to be excluded from the procured equipment.
13	Equipment for Central Workshop	One set of maintenance and repair equipment and tools	1 set	-	To be procured in the on-going technical cooperation project.
Spare Parts for Planned Equip-ment	Consumables for Periodic Maintenance	1 set	1 set	1 set	Preparation of spare parts to ensure smooth implementation of initial operations

4. Verifying the Relevance of the Project

The following direct and indirect effects are expected from the implementation of the Project.

(Direct Effects)

① As the insufficient number of detectors will be corrected , detectors owned that have deteriorated will be renewed, and maintenance and repair will be easier; the efficiency of manual demining operations will be improved; Also the safety of demining personnel will be improved by replacing recycled and deteriorated equipment with new equipment.

② Demining will be carried out more efficiently by maintaining and improving the availability of brush cutters.

(Indirect Effects)

① Harm to local residents due to landmines and UXO can be reduced.

② Local residents will be able to carry out faming more safely by eliminating the fear of landmines and UXO and this will contribute to the revitalization of regional economy and poverty reduction.

③ The Project will help to encourage the conversion to an on-going ‘one-man one-lane operation ‘method, which is favorable for better work efficiency.

Based on the components of the Project, the level of effects, application of equipment and competency to provide maintenance, the implementation of the requested Japanese assistance through Japan’s Grant Aid is judged to be relevant.

The following suggestions have been given to the recipient side in order to ensure and maintain the effects of the implementation of the Project.

- The demining activities plan under the Project is a long-term plan so the recipient country is required to be financially independent. The CMAC relies on aid from UN organizations, bilateral donors and NGOs for more than 90% of the budget for demining activities, and due to budget limitations and an increase in the budget of the Government of Cambodia, at the present time, project contracts on mine clearance in the on-going mine development and financial self-efforts should be actively accepted through the dispatching of experts under the South-South Cooperation.
- Under a limited budget, work efficiency should be further improved in order to improve cost performance while ensuring operational safety.
- Owned equipment should be utilized effectively by taking measures to ensure appropriate maintenance and extending service life, and it is requestedto secure fund for maintenance expenses and to ensure continued renewal of owned equipment that has unavoidably become deteriorated as a result of severe utilizing conditions.

CONTENTS

Location Map

Legend

- Demining Unit #1 Activity Area (DU1)
  Banteay Meanchery Province
- Demining Unit #2 Activity Area (DU2)
  Battambang Province, Pursat Province
- Demining Unit #3 Activity Area (DU3)
  Pailin Province
- Demining Unit #4 Activity Area (DU4)
  Kampong Thom Province, Preah Vihear Province
- Demining Unit #6 Activity Area (DU6)
  Siem Reap Province, Oddar Meancheay Province
- Eastern Regional Office Activity Area
  Kampong Cham Province, Kratie Province

① Phnom Penh (CMAC HQ)
② Battambang (DU2)
③ Battambang (CMAC Central Workshop)
④ Banteay Meanchery (DU1)
⑤ Pailin (DU3)
⑥ Kampong Chhnang (CMAC Training Center)
⑦ Siem Reap (DU4, DU6)
⑧ Kampong Cham (Eastern Regional Office)
⑨ Preah Vihear (DU4)

LIST OF FIGURES AND TABLES

Abbreviation

A/P	Authorization to Pay
B/A	Banking Arrangement
BAC	Battle Area Clearance
BC	Brush Cutter
CIF	Cost, Insurance and Freight
CBMRR	Community Base Mine Risk Reduction
CBURR	Community Base UXO Risk Reduction
CBD	Community Base Demining Team
CMAA	Cambodian Mine Action and Victim Assistance Authority
CMAC	Cambodian Mine Action Centre
CMC	Community Mine Clearance
DU	Demining Unit
EDD	Explosive Detection Dog
E/N	Exchange of Notes
EOD	Explosive Ordnance Disposal
ERO	Eastern EOD Regional Office
GDP	Gross Domestic Product
GNI	Gross National Income
GNP	Gross National Product
GPS	Global Positioning System
Halo Trust	Hazardous Area Life-Support Organization
HI	Handicap International
HQ	Headquarters
ICRC	International Crescent and Red Cross
JAIF	JAPAN-ASEAN Integrated Fund
JCC	The Joint Coordinating Committee
JMAS	Japan Mine Action Service
JICA	Japan International Cooperation Agency
LLD	Long Leash Dog
MAG	Mine Advisory Group
MAT	Mine Awareness Team
MAPU	Mine Action Planning Unit
M/D	Minutes of Discussion
MDD	Mine Detection Dog
MF	Mine field
MIS	Management Information System
MMT	Mine Marking Team
MPL	Mobile Platoon
MRE	Mine Risk Education
MRER	Mine / UXO Risk Education and Reduction
MRRT	Mine Risk Reduction Team
NGO	Non-Governmental Organization
NPA	Norwegian People's Aid
NSDP	National Strategic Development Plan
OJT	On the Job Training
PMAC	Provincial Mine Action Committee
SCN	Save the Children Norway
SLD	Short Leash Dog
SOP	Standard Operating Procedure
SOR	Standard of Regulation
TC	Training Center
TS5	Technical Survey Clearance 5
TSC	Technical Survey Clearance
TST	Technical Survey Team
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNTAC	United Nations Transitional Authority in Cambodia
UXO	Unexploded Ordnance

CHAPTER 1

BACKGROUND OF THE PROJECT

CHAPTER 1
BACKGROUND OF THE PROJECT

1-1 Background of the Requested Japanese Assistance

Most of the demining activity operations, which are urgent, are reliant on equipment. As a result of Japanese assistance, nearly half of the major equipment presently utilized was procured through Japanese Grant Aid. Support from the aspect of equipment has contributed to a drastic improvement in demining work efficiency, such as an increase of more than double the annual mine clearance area.

On the other hand, the CMAC has made an independent effort to provide servicing and maintenance at its own workshop. However, due to intense utilization, equipment has been severely damaged and is gradually reaching its service life, so work efficiency is expected to drop if the present conditions continue. Although it is necessary to maintain and repair worn out equipment and successively renew deteriorated equipment in order to maintain the accuracy and efficiency of demining operations, since the independent budget of the CMAC is still insufficient, the majority of aid from UN organizations and bilateral donors has been invested in operating cost for the demining activities. Therefore, the renewal of required equipment is a major challenge. Of the 2,570 mine detectors owned by CMAC that are major equipment for demining operations, 755 units are unusable, 253 units are being repaired, and 1,562 units are being utilized. Of these only 795 units are within the equipment's service life and the remaining 767 units have reached their service life and are deteriorated. The condition of major mine detectors owned by CMAC is shown in Table 1-1.

Existing CMAC detectors that are usable, including those under repair, by brand include a total of 1,815 units (1,620 units of MINELB F1A4, 175 units of MINELB F3 and 20 units of CEIA MIL-D1). Of those, 795 units in total (600 units of MINELAB F1A4, 175 units of MINELABF3 and 20 units of CEIA MIL-D1) are within their service life.

Faced with these circumstances, the Government of Cambodia submitted a request to the Government of Japan for Grand Aid in order to procure demining equipment such as mine and UXO detectors necessary to accomplish the mine clearance plan.

Table 1-1 Starting Time of Existing Mine Detectors Owned, Number of Units and Conditions as of 2008

Mine and UXO Detector	Model Name	Start of Utilization	No. of Units Owned	In Use	Under Repair	Unusable
MINELAB	F1A4	June 1997	372	87		285
		February 1998	791	359		432
		January 2000	212	139	35	38
		February 2003	400	276	124	
		August 2005	600	507	93	
		Total	2,375	1,368	252	755
MINELAB	F3	December 2005	4	4		
		February 2006	8	8		
		March 2008	40	39	1	
		July 2008	123	123		
		Total	175	174	1	
CEIA	MIL – D1	July 2008	20	20		
		Total	20	20		
		Grand Total	2,570	1,562	253	755

Source: CMAC

The requested components confirmed at the time of the Basic Design include nine (9) items: mine detectors, mine and UXO detectors, communication equipment (handheld VHF), personal protective equipment (PPE vests), personal protective equipment (PPE visors), GPS, spare parts (brush cutters, mine detectors, mine and UXO detectors), mobile workshop (for brush cutters and vehicles) and servicing equipment for the CMAC Central Workshop.

1-2 Natural Conditions

In setting the necessary specifications for mine detectors as major equipment to be procured, natural conditions such as vegetation, soil property, climate and retained water have a significant impact on their performance.

1) Vegetation

Since Cambodia is located in the southern part of the Indo-China Peninsula and is included in the Mekong River basin, its climate, geology and vegetation are strongly influenced by the Mekong River. The dense forests that once covered Cambodia have all but disappeared due to the long-pending civil war, settlement through slash and burn agriculture, and timber exports (including unauthorized exports) except for mountainous regions in the north and south, leaving only scattered medium-sized brush zones, with less than 15cm trunk diameter.

Although sporadic battles between Cambodian government troops and the Khmer Rouge continued until 1999, when peace eventually came in 2000 internally displaced people (farmers who were driven from rural areas due to the armed conflict, and farmers who moved to urban areas but intend to return to rural communities due to the poverty they face in urban areas) began to settle in areas of dangerous minefields through slash and burn agriculture (despite the presence of education on demining and risk aversion, there was no sharp reduction in the number of landmine victims). The slash and burn agricultural areas are concentrated in Pailin, Battambang, Banteay Meanchey, Preah Vihear, Siem Reap, Oddar Meancheay and Kompong Thom Provinces, which were combat zones along the Thai border (in the west and north). Landmine laying conditions in the western and northern regions of Cambodia (near the Thai border) are roughly divided into military base protection, whole battle burying, and landmines buried to hinder living. Since 1993, forests in the central, eastern and southern regions and other areas have been cleared for land and for settlements and have been converted to paddy fields.

Since there is little brush on land cleared for paddy fields and where people have settled, on farms, roads and school lots, a one-man one-lane system can be easily applied on the plains, which is priority area for demining. Although a two-man one-lane system is the preferred method on sloping land or brush areas where there is little human activity, it is relatively low priority land. Most of the minefields where CMAC is promoting mine clearance activities are located in the western and northern regions of Cambodia (near the Thai border) and except for the mountainous and hilly areas of Pailin it is mostly flat land. Slopes in the mountainous region are approximately 10 to 15 degrees.

2) Soil, Climate and Retained Water

Much of the soil in Cambodia is laterite which is a red soil peculiar to the tropical zone. Mine detectors, which are metal detectors, are greatly influenced by the target soil properties. For example, laterite soil in the east which contains magnetism is known to have a negative effect on the performance of metal detectors; therefore obtaining an accurate reading of landmines appears to be difficult. Although detector manufacturers are striving to introduce various new devices to improve their versatility by adapting to various soil properties, there appear to be significant differences in the landmine detecting performance of laterite soil containing magnetism among manufacturers (from the result of a test conducted by CMAC). The rainy season between May and October is a period of high temperatures and high humidity during which time annual average rainfall of 1,400mm is experienced in Phnom Penh, the capital, and 4,000mm in the mountainous regions. Due to the large

amount of rainfall during the rainy season and poor drainage conditions, the problem of retained water is unavoidable. Under such conditions, the detecting performance of each manufacture varies, and so there is a huge gap in their performance. Accordingly, detectors that are adaptable to the varied conditions of each site during operation will be procured.

1-3 Environmental and Social Considerations

With respect to environmental and social considerations pertaining to the implementation of mine action, although legislation related to environmental and social considerations has not yet been completely achieved in Cambodia, during the process of selecting land subject to the present mine clearance, the needs at the beneficiary level (the weak, such as farmers) are taken into consideration through discussions at the rural community and regional levels. Moreover, they are also discussed at the provincial level after which priority areas are isolated and decided on by the Provincial Mine Action Committee (PMCA). Accordingly, the voices of residents are fully reflected in order to prevent any environmental or social problems from arising during the demining implementation. The Mine Action Planning Unit (MAPU) prepares a draft plan as the secretariat and demining organizations such as the CMAC participate in discussions at each level to provide technical support. In addition, representatives from the Cambodian Mine Action and Victim Assistance Authority (CMAA), which is the supervisory organ, are involved in the discussions and monitor the process.

Since land utilization following demining is specified from the requested stage, political considerations are made in order to encourage settlement or establishment of people by prohibiting the sale of land for at least five years after demining.

In this process, with regard to land utilization after demining, land to meet an emergency from the viewpoint of basic human needs (BHN) mainly for farmland, resettlement of farmers, community roads and accessibility to water takes precedence, and land for farming and resettlement accounts for nearly 60% of the total area (2007).

The contents decided by the PMAC are essentially final and CMAA and other superior organizations ratify their decision.

Since mine clearance precedes farming land that was originally farming land and could not be utilized due to landmines, very few new environmental problems arise. The removal of trees and plants is also kept to a minimum and the impact of exhaust gas resulting from the blasting process during the clearing of mines is also temporary. With

respect to the disposal of UXO containing high quantities of explosives, the recycling of gunpowder from landmines cleared during the blasting process is being promoted.

The findings of a survey of environmental impact by mine clearance are shown in Table 1-2.

Table 1-2 Findings of Survey on Environmental Impact by Mine Clearance

Project Name		Project for Improvement of Equipment for Demining Activities (Phase V) in the Kingdom of Cambodia	
No.	Impact Item	Rating	Grounds
Social Environment: * Gender-related and child rights-related impact are related to all social and environmental items.			
1	Involuntary resettlement	D	Not arisen
2	Regional economy such as employment and livelihood	D	Not applicable (NA)
3	Land use and utilization of local resources	D	NA
4	Social institutions such as social infrastructure and local decision-making institutions	D	NA
5	Existing social infrastructure and services	D	By clearing land mines at minefields, accessibility to public facilities will become easier.
6	Vulnerable social groups such as the poor and indigenous peoples and minorities	D	The poor who makes a livelihood by collecting and selling firewood from forests will be favorably affected.
7	Uneven distribution between benefits and losses	D	No factors for occurrence
8	Cultural heritage	D	No factors for occurrence
9	Conflicts of local interests	D	No factors for occurrence
10	Water usage・water rights, common rights	D	No factors for occurrence
11	Public health	D	No factors for occurrence
12	Hazards (risks) of infectious diseases such as HIV/AIDS	D	No factors for occurrence
Natural Environment			
13	Topography・geology	D	No factors for occurrence
14	Soil erosion	D	No factors for occurrence
15	Ground water	D	No factors for occurrence
16	Hydrological situation	D	No factors for occurrence
17	Coastal zone (such as mangroves, coral reefs and tidal lands)	D	No factors for occurrence
18	Flora and fauna, bio-diversity	D	No factors for occurrence
19	Weather	D	No factors for occurrence
20	Landscape	D	No factors for occurrence
21	Global warming	D	No factors for occurrence
Environmental Pollution			
22	Air pollution	D	Temporary air pollution resulting from blasting process will arise.
23	Water pollution	D	No factors for occurrence
24	Soil contamination	D	No factors for occurrence
25	Waste disposal	D	No factors for occurrence
26	Noise・vibration	D	Temporary noise and vibration resulted from blasting process will arise.
27	Land subsidence	D	No factors for occurrence
28	Offensive order	D	No factors for occurrence
29	Sediment	D	No factors for occurrence
30	Accidents	D	No factors for occurrence

Rating classification
A: Serious impact anticipated
B: Some impact anticipated
C: Unidentified (necessary for further examination)
D: No impact anticipated

CHAPTER 2

CONTENTS OF THE PROJECT

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2-1 Basic Concept of the Project

Despite the lapse of nearly 20 years since the end of the civil war in Cambodia, it is estimated that 4 to 6 million mines are underground and more than 2.4 million unexploded ordnances (UXO) remain. It is expected to take a hundred years to complete the demining and clearance. Consequently, the safety of a people who must live with demining, the encouragement of return and resettlement and landmine victim assistance is recognized to be an urgent issue in socio-economic development. In 2003, Cambodia introduced the National Mine Action Strategic Plan with the objective of "Zero Victims" by the year 2012 and "Impact Free" by the year 2015. Since the deadline for disposing anti-personnel mines concluded by the Government of Cambodia in the Ottawa Treaty (Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-personnel Mines and on their Destruction) is approaching, the Government of Cambodia is preparing to extend the deadline to the year 2020 (based on the provision of extending the deadline for completing the destruction for a period up to ten years under the approval of the Meeting of the States Parties, etc.). If the extension of the deadline is granted, it appears the new target year will be 2020. For the time being, the goal of demining is to take mine action activities for 427km^2 of the most densely contaminated areas (equivalent to approximately 10% of the total contaminated areas based on the Level 1 Survey) from 2008 to 2012. Of those, the Cambodian Mine Action Center (established in 1992, hereinafter referred to as "CMAC") has set a goal to remove an area of 228km^2.

In order to attain the above-mentioned goal, CMAC, which takes initiatives for mine action activities, should improve its competency to dispose of 228km^2. Therefore, the annual clearance area will be 27km^2 in 2007, 33.8km^2 in 2008, 38.4 km^2 in 2009, 48 km^2 in 2010, 54 km^2 in 2011 and 54 km^2 in 2012. The aim of the Project is to improve their competency by effectively utilizing currently owned equipment and new equipment, and reducing the demining cost by improving working efficiency. In such a situation, the requested Japanese assistance will procure equipment for demining activities necessary to the implementation of the Project.

The requested components from the equipment discussed and confirmed at the time of the Basic Design are shown in Table 2-1.

Table 2-1 Requested Equipment List

No.	Equipment Name	Quantity (No. of Units)	Specifications, etc.
1	Mine Detector	300 to 400	Type: MINELAB F3, total length at operation time: not more than 80cm (shortest) to not less than 146cm (longest), operating weight: not more than 3.5kg, transmission: multi period sensing, water proofing: IP67, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard
2	Mine Detector	100	Type: CEIA MIL-D1, search head adjustment length: not more than 45cm (shortest) to not less than 157cm (longest), operating weight: not less than 4.0km, protection: IP68, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard
3	Mine/UXO Detector	24 to 77	Type: EBINGER UPEX 740M, total length x total width: not more than 245cm x145cm, operating weight: not more than 6.0kg, transmission: pulse induction, waterproofing: splash proofing, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard
4	Mine/UXO Detector	14 to 47	Type: CEIA MIL-D1/DS, operating bar expansion length: not less than 155cm, operating weight: not more than 6.0kg, protection: IP68, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard
5	Mine/UXO Detector	3 to 6	Type: FOERSTER GROUP FEREX 4.032 DLG “Data Logger Standard”, carrying tube: total length not less than 610mm diameter 32mmφ, operating weight: not more than 5.0kg, waterproofing: IP57, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard
6	PPE (Vest)	1000	Quality: CMAC standard
7	Spare Parts	1 set	▪ Parts for rotary cutter and suspension of brush cutter ▪ Parts for owned mine detector of MINELAB F1A4 and parts for mine/UXO detector of MINELAB F1A4 UXO and EBINGER UPEX 740M
8	Mobile Workshop (for brush cutters)	1	Permissible maximum vehicle weight: not less than 10t, engine: diesel engine, engine horsepower: not less than 140kw, driving type: 4x4, crane capacity: not less than 2.9t, carrier type: aluminum van type, monorail crane capacity: not less than 240kg, mounting: accessories: one set
9	Mobile Workshop (for vehicles)	1	Permissible maximum vehicle weight: not less than 5.5t, engine: diesel engine, engine horsepower: not less than 75kw, driving type: 4x4, carrier type: aluminum van type, mounting: accessories: one set
10	PPE (Visor)	1,500	Quality: CMAC standard
11	GPS	50	Type: handheld
12	VHF	100	Type: handheld
13	Equipment for Central Workshop	1 set	One set of maintenance and repair equipment and tools

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

The Grant Aid project will provide funds to procure equipment necessary for demining and UXO clearance activities at CMAC Headquarters, Demining Units (DUs) and Training Center for which Cambodia takes mine action activities for the purpose of efficiency.

The equipment shall be procured in accordance with the following policy.

(1) Basic Policy

The following two matters shall be basic policy.

- Equipment that directly contributes to manual detecting operations
- Equipment that contributes to the maintenance and improvement of working efficiency of brush cutters

Mine detectors and mine/UXO detectors which are equipment that directly contribute to manual operations (detecting and removal work by hand) are the basis of mine clearance activities, while brush cutters contribute to improving the efficiency of operations and are evaluated highly at the actual sites. For example, by introducing brush cutters through the past grant aid projects, the annual clearance area was doubled ($13km^2 \rightarrow 26km^2$ annually) so they will receive high priority. With respect to mine detectors and mine/UXO detectors, necessary parts for maintenance including the renewal of deteriorated detectors that are five years old or more will be determined by emphasizing efficiency and safety. In the renewal of detectors, CMAC is encouraging a shift from a two-men one-lane system of mine detection and clearance conducted by individual demining personnel to a one-man one-lane system where mine detection and clearance are conducted by one demining personnel.

In order to efficiently utilize brush cutters, necessary parts for maintenance of the currently owned brush cutters will be emphasized. In addition, in order to provide rapid onsite repairs, mobile workshops for brush cutters will be targeted. Moreover, concerning repairs of vehicles used for auxiliary purposes such as personnel transportation, rather than procuring another mobile workshop, the minimum required tools for loading onto an existing mechanic vehicle shall be targeted to enable breakdowns to be repaired on the ground. In due consideration of the safety of

demining personnel, mine detectors should pass the CMAC examination and meet the specifications utilized by CMAC

Of the requested equipment (equipment requested in the M/D), personal protective equipment (PPE) such as vests and visors are inexpensive and are available within Cambodia, so it was confirmed that CAMC could procure PPEs through its own self efforts. In a similar manner this can also be applied to global positioning systems (GPS) and communication equipment (handheld VHF). Since there is a high possibility that CMAC can procure these during the demining project and since consent with CMAC has been reached, they shall be excluded from equipment to be procured. In addition, the necessary servicing equipment at the CMAC Central Workshop will be procured through the on-going technical cooperation project and therefore shall be also excluded from equipment to be procured. In the implementation of the demining project scheduled by the Government of Cambodia, the minimal requirements of specifications and quantity will be procured to meet the competency of operations and maintenance by the implementing agency on the recipient side and its capacity to implement the project.

(2) Policy on Natural Conditions

As described in “1-2 Natural Conditions”, in setting the necessary specifications for mine detectors as major equipment to be procured, as natural conditions such as vegetation, soil property, climate and retained water have a significant impact on their performance, the minimal necessary specifications and quantity will be procured to meet these conditions.

(3) Policy on Local Special Conditions

As many demining sites are areas of brush or places which become muddy during the rainy season, only large four-wheel-drive vehicles are able to access these sites in many cases. And if a brush cutter breaks down at the actual site, it is difficult to transport it on a trailer to the central workshop. A mobile workshop with a crane for brush cutters that can provide simple maintenance and repairs will be procured to improve the availability factor of brush cutters.

Due to poor road conditions up to the working sites, there are many breakdowns, for example, vehicle suspensions and brakes, or flat tires. Since breakdowns often occur one way during a round trip to a site, or in the vicinity of the work sites, the minimal necessary mechanical tools loading onto vehicles presently utilized for a business by mechanics will be procured

As many detecting sites are in areas of brush or places which become muddy during the rainy season, the temperature at working time is also very high making work even more severe, and detectors break down frequently. Consequently, spare parts for the existing detectors will be procured.

(4) Policy on Competence of Maintenance and Operation of Implementing Agency

The competence of maintenance and operation of CMAC, which is the implementing agency on the recipient side, is judged to be an enough level based on the maintenance and operation conditions of equipment presently owned.

(5) Policy on Equipment Grade Setting

Equipment presently owned by CMAC are mainly procured through Japan's Grant Aid scheme and highly evaluated from the aspects of performance and quality. All detectors are products that have passed CMAC testing. In due consideration of the safety of demining personnel and future equipment maintenance, compatibility will be maintained by setting specific equipment that has passed CMAC testing.

(6) Policy on Implementation Schedule

Although mine detectors (MINELAB and CEIA products) and mine/UXO detectors (EBINGER, CEIA and FORESTER products) presently owned by CMAC are third-country products, they are highly evaluated from the aspects of performance, quality and service. Detecting personnel and mechanics are also proficient in the use of these detectors, from the viewpoint of public security measures such as landmine clearance, it seems appropriate that CMAC request detectors be procured from third-countries, brands that have been designated and passed CMAC testing. Accordingly, detectors including parts for existing equipment will be designated third-country brands (Note). Parts for existing Japanese-produced brush cutters should be from the same manufacturers and will be procured from Japan.

The equipment will be delivered to the Training Center in Kampong Chhnang in Cambodia. After inspecting the equipment and instructing initial operations, CMAC will carry the equipment at each work site.

As the equipment with standard specifications will be procured from the manufacturers as much as possible and since a shorter procurement period is being promoted, approximately 14.5 months is assumed from the conclusion of the Exchange of Notes (E/N) to the delivery of the equipment. The detailed schedule will

be prepared by including various procedures to be taken by the Cambodian side and by confirming the progress to each step to prevent any delays.

Note: Reasons for Brand Designation

The reasons for CMAC request for procuring the following equipment by designating brands are listed as follows.

- Mine detectors: MINELAB F3, CEIA MIL-D1
- Mine and UXO detectors: EBINGER UPEX740M, CEIA MIL D1/DS, FORESTER FEREX DLG-STD

① A detector is certified after it has passed a third-party agent, for example, other models are entrusted for a comparative test, which is highly transparent, and a fair evaluation is carried out. Only certified equipment is utilized.

② Not only is a comparison of performance made but also the actual utilization evaluated by demining personnel in actual practice cannot be judged from the specifications. Based on the evaluation, a manufacture is required to improve quality.

③ A standard of operation is prepared with respect to demining operations by utilizing the certified detectors. It is essential for demining personnel to follow this manual for their operations. As described in Paragraph 2, since the manual is revised by incorporating an evaluation from actual utilization, the manual level is being improved.

④ CAMC takes entire responsibility for the selected detectors being utilized.

Based on the results of an examination, the CMAC request for designation of brands is considered to be relevant.

2-2-2 Basic Plan (Equipment Plan)

2-2-2-1 Overall Plan

By selecting and determining the types and specifications of equipment to be procured and the number of units in accordance with the flowchart shown in Figure 2-1, an equipment plan will be formulated and the relevance of the request will be verified.

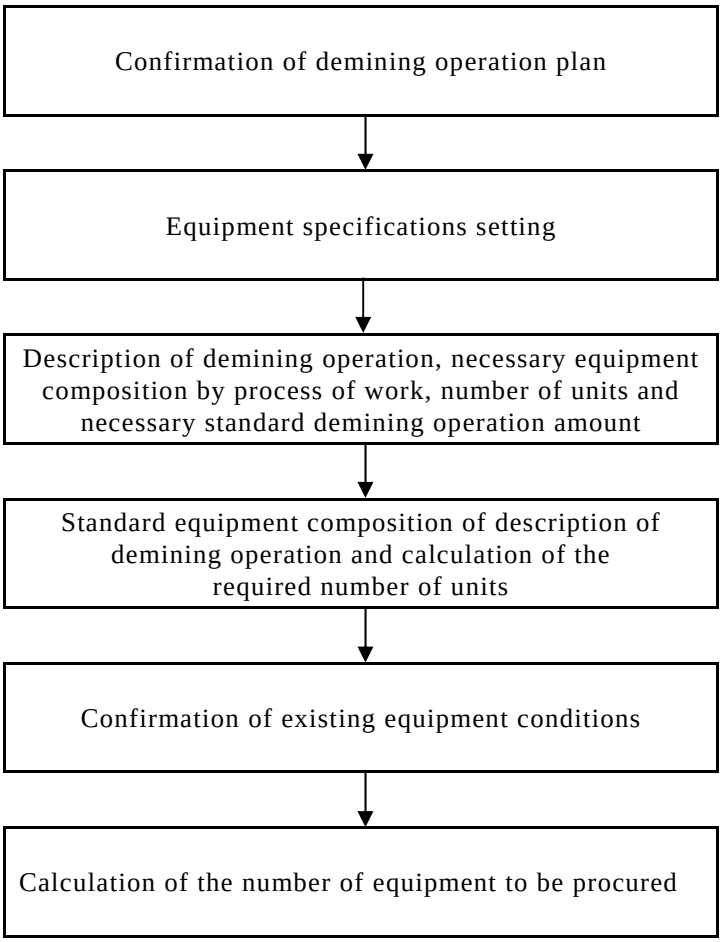


Figure 2-1 Flowchart for Setting Types, Number of Units and Specifications of Equipment to be Procured

(1) Confirmation of Demining Operation Plan

As it is estimated that 4 to 6 million mines are underground and more than 2.4 million unexploded ordnances (UXO) remain in Cambodia even at the present time nearly 20 years after the termination of the civil war, and demining and clearance is expected to take a hundred years to complete. Consequently, the public security and safety by demining, the encouragement of return and resettlement, and landmine victim assistance is recognized to be an urgent issue in socio-economic development.

A contaminated area of 4,466km^2 according to the Level 1 Survey (L1S: national level one survey for mines and UXO) as of 2002 appears to be commonly recognized. Even in the "Mine Action Achievements Report 2007 and Work Plan 2008" obtained from the Cambodian Mine Action and Victim Assistance Authority (CMAA) at the time of the Study, this figure is utilized as the contaminated area.

Of the clearance area of approximately 412km^2 (1992 to 2007), CMAC has cleared approximately 200km^2. For the time being, the national goal is to clear 427km^2 of the most densely contaminated areas (equivalent to approximately 10% of the total contaminated land according to the Level 1 Survey) by the year 2012. The goal of the annual clearance area by CMAC by the year 2012 is shown in Table 2-2. The goal in 2007 is 27km^2 and the goal in 2008 will be increased to more than 30km^2. However, in order to obtain the above-mentioned goal, technological innovation in demining machinery and further donor assistance is expected.

Table 2-2 Goal of Mine Clearance Area

(km^2)

Year	2007	2008	2009	2010	2011	2012
Annual Clearance Area	* 27	33.8	38.4	48	54	54

*: 2007 results of annual clearance area

Source: CMAC

The priority is given to land of high urgency from the viewpoint of basic human needs (BHN) such as farmland, resettlement of farmers, community roads and accessibility to water as land usage after clearance. Farmland and resettlement areas account for nearly 60% of the land area (2007).

(2) Equipment Specifications Setting

The equipment specifications to be procured under the Project are described in Table 2-3 as a result of the specifications of existing equipment owned by CMAC, the scale of landmine clearance operations and discussions with CMAC.

Table 2-3 Equipment Specifications List

No.	Equipment Name	Outline Specifications	Reasons for Specifications Setting
1	Mine Detector	Type: MINELAB F3, total length at operation time: not more than 80cm (shortest) to not less than 146cm (longest), operating weight: not more than 3.5kg, transmission: multi period sensing, water proofing: IP67, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard	It was passed by the CMAC test and many of it are utilized. The latest model of the MIELAB F1A4 presently utilized by demining personnel is MINELAB F3. Handling method of MINELAB F3 is similar to F1A4, so no problems will arise.
2	Mine Detector	Type: CEIA MIL-D1, search head adjustment length: not more than 45cm (shortest) to not less than 157cm (longest), operating weight: not less than 4.0km, protection: IP68, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard	It was passed by the CMAC test. It is utilized as a mine detector, which has fewer malfunctions in magnetic laterite soil. This is mainly utilized at the eastern regional office that conducts detecting operations on magnetic laterite soil sites and is also utilized at Demining Unit 4 (DU4) and the CMAC HQ.
3	Mine/UXO Detector	Type: EBINGER UPEX 740M, total length x total width: not more than 245cm x145cm, operating weight: not more than 6.0kg, transmission: pulse induction, waterproofing: splash proofing, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	It was passed by the CMAC test and is utilized as a mine/UXO detector, so UXO detecting personnel is accustomed. In addition to UXO detecting, this is utilized to confirm the safety after mine detecting work. In operations, one group of two persons can detect a wide area so that this is utilized in a standard manner.
4	Mine/UXO Detector	Type: CEIA MIL-D1/DS, operating bar expansion length: not less than 155cm, operating weight: not more than 6.0kg, protection: IP68, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard	It was passed by the CMAC test and is utilized as a mine/UXO detector, so UXO detecting personnel is accustomed. In addition to UXO detecting, this is utilized to confirm the safety after mine detecting work. In operation, one person can detect so that this can fulfill an assistant role by utilizing this in the vicinity of standing trees or rocks where EBINGER UPEX 740M cannot detect.
5	Mine/UXO Detector	Type: FOERSTER FEREX 4.032 DLG “Data Logger Standard”, carrying tube: total length not less than 610mm diameter 32mmφ, operating weight: not more than 5.0kg, waterproofing: IP57, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	It was passed by the CMAC test. The detector owned by the Broken Hill Proprietary Company (BHP) as a mine/UXO detector. This is utilized at places where it is difficult to detect due to a lot of water or at places with the depth of water. Although the detecting work for landmines and UXO at the retained water where rainwater flows into fields during the rainy season is normally partially neglected, this can detect even at the retained water spots, so this can improve operating efficiency.
6	PPE (Vest)	To be procured in the CMAC’s operation of the Project and to be excluded from the procured equipment	-

No.	Equipment Name	Outline Specifications	Reasons for Specifications Setting
7	Spare Parts	▪ Parts for rotary cutter and undercarriage of brush cutter ▪ Parts for owned mine detector of MINELAB F1A4 and parts for mine/UXO detector of MINELAB F1A4 UXO and EBINGER UPEX 740M	▪ By procuring parts for rotary cutters, which are severely worn out due to direct cutting of brushes, and parts for undercarriage, which are also severely worn out due to removal work while moving, a decline in the efficiency of demining operations will be prevented. ▪ By procuring parts for the owned mine detectors and mine/UXO detectors and repairing the frequently broken-down detectors, the equipment can be utilized so as to secure the required number of detectors.
8	Mobile Workshop (for brush cutters)	Gross vehicle weight: not less than 10t, engine: diesel engine, engine horsepower: not less than 140kw, driving type: 4x4, crane capacity: not less than 2.9t, carrier type: aluminum van type, monorail crane capacity: not less than 240kg, mounting: accessories: one set	By going around brush cutter operation sites, the broken-down brush cutters will be repaired. Based on the 3t hoisting capacity necessary for on-site repair, this will be a truck of 10t class of the gross vehicle weight, which can load 3t class crane. Drive type will be 4x4 for driving on poor roads.
9	Loaded Tools for Vehicle Repair (for vehicle)	One set of tools for mechanics loaded onto vehicles	Due to the many bad roads accessing demining sites, there is a high possibility of vehicle breakdown on the way which should be repaired in the vicinity of the demining sites. Consequently, tools for mechanics necessary for onsite repair, which are insufficient, will be procured. The tool contents will be general-purpose. Tool boxes which can be loaded onto vehicles will be procured.
10	PPE (Visor)	To be procured in the CMAC's operation of the Project and to be excluded from the procured equipment	-
11	GPS	To be procured in the CMAC's operation of the Project and to be excluded from the procured equipment	-
12	VHF	To be procured in the CMAC's operation of the Project and to be excluded from the procured equipment	-
13	Equipment for Central Workshop	To be procured in the on-going technical cooperation project.	-

(3) Demining Operation Description and Necessary Equipment Composition/Number of Units and Necessary Amount of Demining Operations

As a grant is scheduled in 2009, this will be examined to estimate existing equipment conditions in 2009.

In order to attain the goal of "Zero Victim" by the year 2012, the goal for the time being is to clear 427km2 of the most densely contaminated areas (equivalent to approximately 10% of the total contaminated land according to the Level 1 Survey).

Of those, a goal of CMAC is to remove an area of 228km2 between 2008 and 2012. In order to attain the goal, detecting teams and staff preparation plan between 2008 and 2012 are shown in Table 2-4

Table 2-4 Number of Detecting Teams and Staff Preparation Plan between 2008 and 2012

Year	2008		2009		2010		2011		2012	
T: Number of Teams *1 S: Number of Staff	T	S	T	S	T	S	T	S	T	S
Mobile Platoons (MPL)	34	850	32	800	30	750	30	750	30	750
Short Leash MDD (SLD)	10	90	10	90	8	72	5	45	5	45
Long Leash MDD LLD)	4	20	4	20	6	30	8	40	8	40
Explosive Detection Dog (EDD)	4	20	4	20	6	30	8	40	8	40
Community Mine Clearance Team (CMC)	13	91	9	63	9	63	9	63	9	63
Community-based Demining Platoon (CBD)	5	150	4	120	4	120	4	120	4	120
Brush Cutters (BC)	23	207	23	207	17	153	14	126	14	126
Demining Machines (DM)	4	20	4	20	11	55	14	70	14	70
Mine/UXO Risk Education (MRE)	6	24	6	24	6	24	6	24	6	24
Explosive Ordnance Disposal (EOD)	24	72	30	90	30	90	30	90	30	90
Battle Area Clearance (BAC)			4	56	9	126	9	126	9	126
Survey Team (TST)	4	20	27	135	27	135	27	135	27	135
Large Technical Survey Team (TSC)	2	20								
Small Technical Survey Team (TS5)	19	95								
Community-based Mine Risk Reduction (CBMRR)	26	24	33	33	33	33	20	20	20	20
Community-based UXO Risk Reduction (CBURR)	37	37	40	40	50	50	60	60	60	60
Explosive Remnants of War Clearance Machines (ERWCM)							3	30	3	30
Explosive Remnants of War Clearance Team (ERWCT)	4	80	12	84	15	105	15	105	15	105
Total	219	1820	242	1802	261	1836	262	1844	262	1844

*1: The number of teams includes the number of platoons.

Source: CMAC

Of the above-mentioned teams, those that do not utilize detectors directly are Community-based Mine Risk Reduction (CBMRR) and Community-based UXO Risk Reduction (CBURR). The standard of required number of mine detectors per team is shown in Table 2-5.

Table 2-5 Required Number of Mine Detectors Per Team

	Mine Detector
Mobile Platoons (MPL) One-man One-lane	22
Mobile Platoons (MPL) Two-man One-lane	16
Short Leash MDD (SLD)	5
Long Leash MDD (LLD)	3
Explosive Detection Dog (EDD)	3
Community Mine Clearance Team (CMC)	8
Community-based Demining Platoon (CBD)	16
Brush Cutters (BC)	8
Demining Machines (DM)	1
Mine/UXO Risk Education (MRE)	2
Explosive Ordnance Disposal (EOD)	2
Battle Area Clearance (BAC)	4
Survey Team (TST)	6
Large Technical Survey Team (TSC)	4
Small Technical Survey Team (TS5)	3
Explosive Remnants of War Clearance Machines (ERWCM)	2
Explosive Remnants of War Clearance Team (ERWCT)	3

Source: CMAC

Of the Mobile Platoons (MPL) in 2008, there are 34 teams posted in total including 21 of one-man one-lane teams composed of 25 persons and 13 two-man one-lane teams composed of 31 persons. However, all teams will be composed of one-man one-lane and 32 teams will be posted in 2009. As each one-man one-lane team needs 22 mine detectors, there are six extra units compared with the two-man one lane team which needs 16 units.

(4) Standard Equipment Composition of Demining Operation Description and Calculation of Required Number of Units

The standard equipment composition of the demining operation description and the required number of units by detector are described.

1) Mine Detectors

As shown in the previous Table 2-4, landmine clearance in 2009 is scheduled through 242 teams with 1,802 persons. The required number of mine detectors is 1,623 units as shown in the following Table 2-6. When the owned detectors are insufficient CMAC appropriates recycled equipment for insufficient equipment by assembling second-hand parts (hereinafter referred to as "recycled equipment").though it takes time. As CMAC frequently utilizes the recycled equipment, taking into consideration the decline in this operating ratio, approximately 15% of the number of units is arranged at demining units (DUs), the Eastern Regional Office (ERO), CMAC Headquarters (HQ) and Training Center (TC). In order to improve the operational efficiency of demining personnel and to increase their safety, training equipment is essential. The required number of teams that need mine detectors by office is shown in Table 2-6.

Table 2-6 Required Number of Teams that Need Mine Detectors by Office

2009 Plan	MPL	CBD	CMC	BC	DM	BAC	SLD	LLD	EDD	TST	EOD	MRE	ERW CT	DU No. of Spare Units	Total No. of Teams
DU1	7		1	4	1		2	1		5	2			(39)	23
DU2	10	3	1	10	1		3	3		6	3	1		(69)	41
DU3	4		1	3	1		2			4	3	1		(26)	19
DU4	5	1	1	3	1		3			5	4	1		(34)	24
DU6	6		1	2						3	3	1		(29)	16
ERO			3	1		4			4	4	10	1	4	(0)	31
HQ			1								5	1	8	(7)	15
TC														(30)	
Total No. of Teams	32	4	9	23	4	4	10	4	4	27	30	6	12		169
Required No. of Detector	704	64	72	184	4	16	50	12	12	162	60	12	36	(235)	1,623

Note: Refer to Table 2-4 for English abbreviations
Source: CMAC

CMAC frequently utilizes MINELAB F1A4 as a mine detector, so demining personnel are familiar with this model. As the model F1A4 has changed to F3, its handling is similar to that of F1A4 so no problems will arise.

It is necessary to utilize CEIA MIL-D1 in the detecting work in eastern areas since it has fewer malfunctions in magnetic laterite soil. Breakdown in the number of units for this model is as follows.

- Breakdown in the Number of Units of CEIA MIL-D1

  The breakdown in the number of units of a mine detector of CEIA MIL-D1 is shown in Table 2-7. Since soil in the east contains a lot of magnetic laterite, 118 units of CEIA MIL-D1 are scheduled to be arranged at the Eastern Regional Office (ERO) for onsite operations. The aforesaid spare units will not be arranged since all 20 units owned are still within their service life. In addition, two units are to be arranged for the Training Center. Through this planning, the required number of detectors is 120 units (118+2=120).

Table 2-7 Required Number of Teams that Need CEIA MIL-D1 and Number of Units

2009 Plan	MPL	CBD	CMC	BC	DM	BAC	SLD	EDD	TSC	EOD	MRE	ERW CT	Office No. of Spare Units	Total
No. of ERO Teams			3	1		4		4	4	10	1	4		31
ERO Required No. of Units			24	8		16		12	24	20	2	12	(0)	118
TC Required No. of Units													2	2
Total Required No. of Units														120

Note: Refer to Table 2-4 for English abbreviations
Source: CMAC

2) Mine/UXO Detectors

Mine/UXO detectors are also utilized for confirming the safety following mine detecting operations in addition to UXO detection.

(a) EBINGER UPEX 740M

This model is utilized by a team of two persons and can cover a wide area.

Table 2-8 Number of Teams that Need EBINGER UPEX 740M by Office

2009 Plan	MPL	CBD	CMC	BC	SLD	LLD	EDD	EOD	MRE	ERW CT	Total No. of Teams
DU1	7		1	4	2			2			17
DU2	10	3	1	10	3	3		3	1		34
DU3	4		1	3	2			3	1		14
DU4	5	1	1	3	3			4	1		18
DU6	6		1	2				3	1		13
ERO			3	1			4	10	1	4	23
HQ			1					5	1	8	15
Total No. of Teams	32	4	9	23	10	4	4	30	6	12	134

Note: Refer to Table 2-4 for English abbreviations
Source: CMAC

Based on the findings of a hearing conducted at the study of the field survey, although working efficiency falls at the present time, detection is presently being operated by sharing among each detecting team or among each detecting team within a demining unit (DU). Approximately five units are being shared among ten teams at the present time. However, since this number of units is insufficient to keep work efficiency, they have requested at least seven units for ten teams. 95 units are needed for 134 teams in 2009 to be applied seven units for ten teams to increase the working efficiency. And two units for the Training Center are to be arranged, 97 units are totally required.

Table 2-9 Number of Teams that Need EBINGER UPEX 740M and Required Number of Units

2009 Plan	DU1	DU2	DU3	DU4	DU6	ERO	HQ	TC	Total
No. of Teams	17	34	14	18	13	23	15	-	134
About 5 units for 10 Teams under the present condition	9	17	7	9	7	11	8	2	70
Required No. of units when 7 units are arranged in 10 teams	12	24	10	13	9	16	11	2	97

* Two units at TC are utilized for training.
Source: CMAC

(b) CEIA MIL-D1/DS

As a mine/UXO detector, CEIA MIL-D1/DS is operated by one person who can detect at a clump of trees or in the vicinity of large rocks. It is utilized at places where two-man one-line of EBINGER UPEX 740M cannot detect. Compared to mine detectors, this has a lesser burden the on demining personnel and a smaller impact on work efficiency, so it fulfills a supplementary role. Due to the insufficient number of owned units, in a similar manner as with EBINGER UPEX 740M this is being shared among each team in DU or among each DU. The number of units that the teams can utilize is 37 units by extracting two units arranged at the Training Center from 39 units owned. Based on the findings of a hearing conducted at the time of field survey, although approximately 0.28 units (including Mine lab F1A4 UXO) are being shared per team at the present time, the number of units is insufficient to keep work efficient, so they have requested double the number of existing units per team. However, based on discussions with concerned officials at the CMAC HQ, in due consideration of the supplementary role of CEIA MIL-D1/DS, it was concluded that an increase in the number of approximately 50% will meet the condition requirements. The Consultant confirmed this and therefore judged it to be appropriate.

Accordingly, the required number will be 55. Since the number of units owned is 37, the newly required number of units is 16. The number of teams that need a mine/UXO detector, CEIA MIL-D1/DS and the number of units arranged are shown in Table 2-10.

Table 2-10 Number of Teams that Need CEIA MIL-D1/DS and Number of Units Presently Arranged

2009 Plan	DU1	DU2	DU3	DU4	DU6	ERO	HQ	TC *2	Total
No. of Teams that need CEIAMIL-D1/DS	17	34	14	18	13	23	15		134
Required No. of Units *1	7	14	5	7	5	9	6	2	55

Source: CMAC

*1: Although 0.28 unit of CEIA MIL-D1/DS is presently being shared by one team in a supplementary manner, this indicates that the required number of units through the number of units shared per team is approximately 1.5 times of the present conditions (sharing of approximately 0.42 units per one team) by improving the situation.

*2: Two units at TC are utilized for training.

(c) FOERSTER FEREX 4.032

A mine/UXO detector, FOERSTER FEREX 4.032, is utilized at sites where a lot of moisture exists, water is deep or where it is difficult for other detectors to detect.

Although CMAC utilizes four detectors that can detect in deep water, the units are presently owned by BHP and are only utilized for the project, so they are not posted at each DU. Consequently, the detection of landmines and unexploded ordnances at sites where retained water exists and where rainwater flows into fields during the rainy season is partially neglected until water flows out and dries up to some extent.

Accordingly, seven units in total should be arranged, at least one unit at each DU and ERO and one unit at Training Center for training equipment. However, considering that the utilization is limited to sites where retained water exists or in deep water; a total of three units are planned and one will be posted at DU2 and ERO which is particularly far from the other offices, and at the Training Center. The units at DU2 and the Training Center will be shared with other

Table 2-11 Required Number of Units of FOERSTER FEREX 4.032

	DU2	ERO	TC	Total
Required No. of Units	* 1	1	* 1	3

*: Each unit at DU2 and TC will be shared with DU1, DU3, DU4, DU6 and CMAC HQ.

3) Owned Mine Detectors Conditions in 2009

a) Mine Detectors

The number of owned mine detectors in 2008 is 1,815 units in total (1,562 units which are being utilized and 253 units which are under repair). Of those, the total number of units within service life is only 795 units (600 MINELAB F1A4 units, 175 MINELAB F3 units, and 20 CEIA MIL-D1 units). The number of recycled equipment is 1,020 units. Since it becomes very difficult to maintain recycled equipment over time, parts have become detached and some recycled detectors are no longer usable due to

deterioration. As of 2009, the number of usable units is estimated to be 567 units considering the conditions of the existing detectors in 2008. The number of usable units owned will be 1,362 units in 2009 as shown in Table 2-12.

According to an onsite hearing survey, the operating ratio of recycled equipment accounts for nearly 60% of the detectors within their service life, so the number of the recycled equipment exceeding the service life, which is equivalent to the detectors within the service life, is 340 units (567 units x 60%). As mentioned above, 1,135 units obtained by adding 340 recycled units equivalent to those within their service life to 795 units that are within their service life is the number of units that are equivalent to those within their service life.

Table 2-12 Number of Mine Detectors Assumed to be being Utilized and Number of Units Equivalent to those within their Five-year Service Life in 2009

Model Name	Starting Time to Utilize	No. of Units	No. of Years Elapsed	Ratio of Usable Units (%) *1	No. of Units Expected to being Utilized *2		No. of Units Equivalent to those within 5-year Service Life *3	
F1A4	June 1997	87	12	0	Recycled Equipment	0	Recycled Equipment	0
	February 1998	359	11	23.3		84		50
	January 2000	174	9	64		111		67
	February 2003	400	6	93		372		223
		Total				567		340
	August 2005	600	4	100		600		600
		Total				1,167		940
MINELAB F3	December 2005	4	4	100		4		4
	February 2006	8	3	100		8		8
	March 2008	40	2	100		40		40
	July 2008	123	2	100		123		123
		Total				175		175
CEIA MIL-D1	July 2008	20	4	100		20		20
		Total				20		20
Grand Total						1,362		1,135

*1 The ratio of usable units (%) was estimated based on the past results of detectors.

*2 The number of units assumed to be utilized includes the recycled equipment exceeding the five-year service life.

*3 According to an onsite survey, since the operating ratio of recycled equipment accounts for nearly 60% of the detectors still within their service life, the number of recycled units equivalent to those within their 5-year service life was calculated using the number of the recycled equipment x 60%.

b) Mine/UXO Detectors

b)-1 EBINGER UPEX 740M

As shown in Table 2-6, the number of existing mine/UXO detectors owned in 2008 is 108 units in total (70 units of EBINGER UPEX 740M, 23 units of MINELAB F1A4 UXO and 15 units of CEIA MIL-D1/DS); whereas, the number of units which are being repaired is 4 units in total (3 units of EBINGER UPEX 700M and 1 unit of MINELAB F1A4 UXO), so the number of usable units including detectors which are being repaired is 112 units.

MINLAB F1A4 UXO and CEIA can be operated by one person and can detect in the vicinity of rocks, which can fulfill a supplementary role at sites where EBINGER UPEX 740M cannot detect using a single team of two individuals.

As shown in Table 2-13, the number of units of EBINGER UPEX 740M utilized the recycled equipment exceeding the service life of the existing mine/UXO detectors owned in 2008 is 7 units. However, it appears that some detectors are unusable in 2009 due to degradation, so the number of units utilizing recycled equipment is estimated to be 6 units. Since the number of units still within their five-year service life in 2009 will be 66 units and the number of recycled equipment equivalent still within their service life will be 4 units (6 units x 60%) as described earlier, the number of units equivalent to those still within their service life is 70 units in total.

b)-2 CEIA MIL-D1/DS

The existing mine/UXO detectors owned by CMAC are 39 units in total (24 units of MINELAB F1A4 UXO 24 and 15 units of CEIA MIL-D1/DS 15) and all of those are within their five-year service life.

b)-3 FOERSTER FEREX 4.032

Since these are owned by BHP and are utilized only for BHP projects at the present time, the detectors are not being posted at each DU.

Table 2-13 Number of Mine/UXO Detectors Assumed to be being Utilized and Number of Units Equivalent to those within their Five-year Service Life

Model Name	Starting Time to Utilize	No. of Units	No. of Years Elapsed	Ratio of Usable Units (%) *1	No. of Units Expected to being Utilized *2		No. of Units Equivalent to those within 5-year Service Life *3	
EBINGER UPEX 740M	April 2001	7	8	83	Recycled Equipment	6	Recycled Equipment	4
		Total				6		4
	January 2004	4	5	100		4		4
	April 2005	48	4	100		48		48
	June 2007	1	2	100		1		1
	February 2008	3	1	100		3		3
	June 2008	10	1	100		10		10
		Total				72		70
MINELAB F1A4 UXO	August 2005	24	4	100		24		24
		Total				24		24
CEIA MIL -D1/DS	August 2005	11	1	100		11		11
	August 2005	4	1	100		4		4
		Total				15		15
	Grand Total					111		109

*1 The ratio of usable units (%) was estimated based on the past results of the unusable detectors in 2008.
*2 The number of units assumed to be utilized includes recycled equipment exceeding their five-year service life.
*3 According to an onsite survey, since the operating ratio of recycled equipment accounts for nearly 60% of detectors within their service life, the number of recycled units equivalent to those still within their five-year service life was calculated using the number of recycled equipmentx60%.

(5) Calculation of Number of Equipment to be Procured

By deducting the number of existing units within their service life and the number of units of the recycled equipment equivalent to those within their service life from the annual required number of units of the equipment mentioned earlier, additional required units will be procured under the Project. The number of units to be procured is shown in the following table.

1) Mine Detectors

(a) Number of Mine Detectors to be Procured

The estimated number of mine detectors to be procured is shown in Table 2-14.

Table 2-14 Calculation of Procured Number of Mine Detectors

Required Number of Units	1,623	2009 Plan
No. of owned detectors within their service life	795	
No. of recycled equipment equivalent to those within their service life	340	
No. of units to be newly required	488	1,623-(795+340)
No. of units to be procured	488	

Table 2-15 Calculation of Procured Number of CEIA MIL-D1 Detectors

Required Number of Units	120	2009 Plan
No. of owned detectors	20	
No. of units to be newly required	100	120-20
No. of units to be procured	100	

The number of units of CEIA MIL-D1 to be procured is 100.

As shown in Table 2-16, the number of MINELAB F3 to be procured will be 388 units obtained by deducting 100 CEIA MIL-D1 units from 488 mine detectors to be procured.

Table 2-16 Calculation of Procured Number of MINELAB F3 Detectors

Required Number of Mine Detectors	488	
No. of CIEA MIL-D1 detectors to be procured	100	
No. of MINELAB F3 detectors to be procured	388	

(b) Mine/UXO Detectors

(b)-1 EBINGER UPEX 740M

The estimated number of units of EBINGER UPEX 740M to be procured is shown in Table 2-17.

Table 2-17 Calculation of Procured Number of EBINGER UPEX 740M Detectors

Required Number of Units	97	2009 Plan
No. of owned detectors within their service life	66	
No. of the recycled equipment within their service life	4	
No. of units to be newly required	27	97-(66+4)
No. of units to be procured	27	

The number of detectors to be procured will be 27 units.

(b)-2 CEIA MIL-D1/DS

The estimated number of units of CEIA MIL-D1/DS to be procured is shown in Table 2-18.

Table 2-18 Calculation of Procured Number of CEIA MIL-D1/DSDetectors

Required Number of Units	53	2009 Plan
No. of owned detectors within their service life	39	
No. of units to be newly required	14	53-39
No. of units to be procured	14	

The number of detectors to be procured will be 14 units.

(b)-3 FOERSTER FEREX 4.032

The estimated number of units of FOERSTER FEREX 4.032 to be procured is shown in Table 2-19.

Table 2-19 Calculation of Procured Number of FOERSTER FEREX 4.032Detectors

Required Number of Units	3	2009 Plan
No. of owned detectors within service life	0	
No. of units to be newly required	3	
No. of units to be procured	3	

The number of detectors to be procured will be 3 units.

2) Spare Parts

(a) Spare Parts for Brush Cutters

After examining the components requested by CMAC, as shown in Table 2-20, spare parts for brush cutters for two-year operations were requested. Since the majority of CMAC's activities is dependent on donor funding, although the future CMAC's activities is controlled by the amount of donor aid, the United Nations Development Program (UNDP), which provides nearly 40% of the overall CMAC budget, has declared it will provide assistance of $4 million annually until 2010. Therefore, the budget for the project implementation has been secured. In addition, assistance from other major donors such as USA and Germany is expected to continue for a couple more years. As shown in Table 2-2, the goal of the landmine and UXO clearance is based on actual results of 27km^2 in 2007 to 38.4km^2 in 2009 and 48km^2 in 2010. In order to implement this plan, although spare parts for existing brush cutters are essential, if spare parts cannot be not secured, appropriate maintenance and repair work cannot be done, which could have a direct effect on the brush cutter bodies themselves. CMAC's funds are so limited that they have difficultly procuring spare parts by themselves. The request for spare parts for two-year operations is considered to be relevant.

With respect to spare parts of undercarriage of the 8 brush cutters granted through the Phase III project, spare parts related to track-links and sprockets will be procured for spare parts of 4 brush cutters whose undercarriage have become excessively worn (items No. 28~37 in Table 2-20).

Moreover, since external hydraulic hose replacement intervals will become more frequent in line with the adoption of the new ground engaging method and so on contributing to higher work efficiency, hoses and adapters (sockets) that can be easily made to size shall be procured as single (detachable) items with a view to enhancing general adaptability and reducing the burden of parts stocks (items No. 12~27 in Table 2-20). CMAC already possesses the equipment for caulking adapters to hoses, so there is no problem regarding manufacturing. In consideration of stock numbers and annual average consumption, a two year supply of brush cutter parts will be calculated and procured as shown below while also taking into account 20~30% spare parts in future demining plans, etc. Concerning spare quantities of hydraulic hoses and adapters, up to three times the quantities in service will be procured upon considering the replacement frequency.

As for hydraulic hoses with sockets already attached (items No. 9~11 in Table 2-20), the minimum required quantity shall be procured.

Table 2-20 Stock Quantity, Annual Average Consumption of Spare Parts for Hitachi -ZX160 Brush Cutter and Requested Components

NO.	Part Name	Item Name	Quan-tity	Follow-up Coopera-tion	Stock Quantity	Annual Average Consump-tion	Required Quantity per one unit	Procured Quantity
1	BM307-SG16C2	Rotary cutter Assy	set				1	1
2	Y30002	Rotary cutting drum	set				1	2
3	Y30036	Cutter bit	piece	194		510	36	1,000
4	Y30035	Cutter Holder	piece	100	95	75	36	100
5	Y40058	Bolt	piece	400	894	510	36	330
6	Y40059	Bushing	piece	1,000	849	510	36	360
7	4614911	Electronic Control Motor	piece	4		4	1	10
8	Y30100	Valve	piece	4		2	1	4
9	Y40068	Hose (1350 mm)	piece	4		7	4	10
10	Y40069	Hose (1550 mm)	piece	4		3	4	10
11	Y40076	Hose (1550 mm)	piece	4	2	4	4	10
12	PA0704	Hose (PA0704)	m	20		7	1.6m	40
13	PA0706	Hose (PA0706)	m	40		16	2.7m	50
14	PA0708	Hose (PA0708)	m	20		12	1.5m	30
15	PA2106	Hose (PA2106)	m	40		19	6.2m	40
16	HQ3512-77	Hose (HQ3512-77)	m	40		15	4.9m	40
17	UA04F2	Adapter (UZ04F2)	piece	30	28	10	5	30
18	UA04F2R9	Adapter (UZ04F2R9)	piece	30	25	16	3	30
19	UA06F2	Adapter (UB06F2)	piece	50	8	24	20	50
20	UA06F2R9	Adapter (UB06F2R9)	piece	50	49	20	2	50
21	UB06F2	Adapter (UB06F2)	piece	50		23	16	50
22	UB06F2R9	Adapter (UB06F2R9)	piece	50	65	20	10	50
23	UA08F2	Adapter (UA08F2)	piece	30		12	6	30
24	UB12C	Adapter (UB12C)	piece	50		27	10	50
25	UB12CR9	Adapter (UB12CR9)	piece	50	41	20	2	50
26	UB12Q2	Adapter (UB12Q2)	piece	40	20	22	8	40
27	UB12Q2R9	Adapter (UB12Q2R9)	piece	10	10	6	2	10
28	4S00517	Roller, upper assy	piece	5		4	4	5
29	4S00509	Roller, lower assy	piece	6		4	14	6
30	4331851	Bolt for Roller, Lower assy	piece	24		10	56	24

NO.	Part Name	Item Name	Quan-tity	Follow-up Coopera-tion	Stock Quantity	Annual Average Consump-tion	Required Quantity per one unit	Procured Quantity
31	9151323	Track-Link Assy	set				2	4
32	9200213	Track-Link Assy	set				2	4
33	4350565	Bolt; Shoe	piece				172	688
34	4247133	Nut; Shoe	piece				172	688
35	4S00538	Sprocket	piece				2	8
36	J932055	Bolt	piece				16	128
37	A590920	Washer; Spring	piece				16	128

(b) Spare Parts for Detectors

When examining spare parts for the existing detectors, as shown in Table 2-21 spare parts for a two-year operation were requested. As mentioned earlier in the paragraph on spare parts for brush cutters, the continued assistance of donors for a period of two years can be expected so funds can be secured. Spare parts for detectors are essential for the implementation of CMAC activities planning. CMAC's funds are so limited that they have difficulty procuring spare parts by themselves. The request for spare parts for two-year operations is considered to be relevant.

Although spare parts were procured under the follow-up cooperation implemented in 2006, as shown in Table 2-21, the quantity of stock is insufficient.

In similar manner as with brush cutters, in consideration of stock numbers and annual average consumption, a two year supply of detector parts will be calculated and procured while also taking into account 2~30% spare parts in future demining plans, etc. Moreover, concerning transistors for the Ebinger UPEX 740M (item No. 11 in Table 2-21), only the minimum quantity shall be procured here because new equipment will be procured in the project.

Table 2-21 Quantity, Annual Average Consumption and Requested Components

Mine lab F1A4			Follow-up Cooperation	Stock Quantity	Annual Average Consumption	Procured Quantity
1	2018-0022	Coil 200mm F1A4	200	12	191	400
2	5904-00215	Power Control Board (PCB) F1A4			9	20
3	2003-0010	Skip plate green		7	45	100
4	7701-0014	FET VN2410	850	132	160	200
5	0304-0004	Battery carrier			47	100
6	0703-0046	Battery cover			50	100
7	8301-0009	Switch F1A4 in wire			45	100
8	8007-0015	Lower shaft	200		48	100
9	8012-0005	Main shaft	140	40	44	50
10	0705-0001	Panel-front	40		10	20
11	0705-0002	Panel-rear	50		10	20
12	2301-0016	Conn coil inc wire	100	99	71	50
13	2301-0020	Conn coil cable end			48	100
	Total					1360

Mine lab F1A4UXO			Follow-up Cooperation	Stock Quantity	Annual Average Consumption	Procured Quantity
1	2021-0036	Coil 460mm F1A4UXO	10		5	12
2	8007-0015	Lower shaft			5	12
	Total					24

Ebinger UPEX 740M			Follow-up Cooperation	Stock Quantity	Annual Average Consumption	Procured Quantity
1	I0001070	Housing of electronic box no lateral closures	15	12	15	20
2	H740304	Lateral section of box power pocket side	15	12	15	20
3	I0001068	Lateral section of box loudspeaker side	15	12	15	20
4	H740324	Chassis for electronic modules	5	2	9	20
5	H740320	Operation panel complete with seal	7	3	3	5
6	H740390	Galvanometer	45	2	3	5
7	H740377	Transmitter module 740.2 (three pots)	10		9	20
8	H740376	Receiver module 740.3 (two pots)	10		9	20
9	H740362	Audio module 740.4 (one pot)	10	1	9	20
10	I0740125	Large loop 2600mm for UPEX 740M MIL with MIL Plug and connection cable 1.50m	50		24	50
11	I0000549	Power supply and transmitter Transistor (740M.3)	10		15	10
12	60740010	Conn. Cable electronic box, batt. container	10		15	20
		Total				230

In similar manner as with spare parts for existing detectors, spare parts for two-year operations will be procured for newly procured detectors

4) Mobile Workshop

(a) Mobile Workshop for Brush Cutters

The frequency of mobile workshop patrolling is scheduled for twice a year at each site and the period of maintenance and repair at each site is approximately six days per time. Based on the following calculation of the required number of mobile workshops, the number of units to be procured will be one vehicle.

23 sites x 2 times/year x 6/30 months = 9.2 months
(2.8 months for operations at Central Workshop)

Spare parts for mobile workshops will be procured for initial replacement and the first replacement for periodic maintenance.

(b) Mobile Workshop for Vehicles

Large-scale and medium-scale repairs at the time of broken-down of vehicles are carried out at the Central Workshop; whereas, minor repairs are conducted at each DU workshop. When a vehicle breaks down, due to the long distance between the site and the workshop, long time is required for transportation to repair, depending on the trouble, sometimes, it is necessary to transport the vehicle with a truck. By repairing onsite, the operating ratio of vehicles could be improved. According to the site survey, the frequency of visits by a mechanic from the Central Workshop to a site for vehicle repair is approximately 25 times a year. A mechanic for vehicles visits a site using a vehicle owned and carries out repairs. At the same time, he provides repair instructions and maintenance guidance to the mechanics at DU, six times a year (six DUs in total). The maintenance and repair period is approximately five days per time. As a crane is rarely necessary for vehicle repair at the site, general tools such as a mechanic tool set are loaded onto currently owned vehicles utilized when visiting the site to deal with onsite vehicle repairs. Based on the calculation of required number as follows, a mechanic tool sets and general tools for the mechanic’s vehicle will be procured.

(6 sites x 6 times+25 times) x 5/30 months = 10.2 months
(1.8 months for operations at Central Workshop)

2-2-2-2 Equipment Plan

An equipment plan prepared and based on the components requested by CMAC and the results of the above-mentioned plan is outlined in Table 2-22.

Table 2-22 Equipment Plan Overview

No.	Equipment Name	Outline Specifications	Requested Quantity (Request)	Requested Quantity (At signing M/D)	Planned Quantity	Intended Purpose, etc.
1	Mine Detector	Type: MINELAB F3, total length at operation time: not more than 80cm (shortest) to not less than 146cm (longest), operating weight: not more than 3.5kg, transmission: multi period sensing, water proofing: IP67, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard	400	300~400	388	Detection of metals and landmines
2	Mine Detector	Type: CEIA MIL-D1, search head adjustment length: not more than 45cm (shortest) to not less than 157cm (longest), operating weight: not less than 4.0km, protection: IP68, battery: charging-type, partially with battery charger, with hard case, quality: CMAC standard	-	100	100	▪ Detection of metals and landmines. ▪ Utilized in magnetic laterite soil
3	Mine/UXO Detector	Type: EBINGER UPEX 740M, total length x total width: not more than 245cm x145cm, operating weight: not more than 6.0kg, transmission: pulse induction, waterproofing: splash proofing, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	80	24~77	27	▪ Detection of landmines and UXO buried deeply ▪ Detection of a wide area with two-man team
4	Mine/UXO Detector	Type: CEIA MIL-D1/DS, operating bar expansion length: not less than 155cm, operating weight: not more than 6.0kg, protection: IP68, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	-	14~47	14	▪ Detection of landmines and UXO buried deeply ▪ Detection even for a narrow area using one person
5	Mine/UXO Detector	Type: FORESTER GROUP FEREX 4.032 DLG “Data Logger Standard”, carrying tube: total length not less than 610mm diameter 32mmφ, operating weight: not more than 5.0kg, waterproofing: IP57, battery: charging-type, partially with battery charger, with carrying case, quality: CMAC standard	-	3~6	3	▪ Detection of landmines and UXO buried deeply ▪ Detection of places with a lot of water or with deep water

No.	Equipment Name	Outline Specifications	Requested Quantity (Request)	Requested Quantity (At signing M/D)	Planned Quantity	Intended Purpose, etc.
6	PPE (Vest)	Quality: CMAC standard	500	1000	-	To be purchased in the demining project of CMAC, and shall be removed from the equipment procured
7	Spare Parts	▪ Parts for rotary cutter and suspension of brush cutter ▪ Parts for owned mine detector of MINELAB F1A4 and parts for mine/UXO detector of MINELAB F1A4 UXO and EBINGER UPEX 740M	-	1 set	1 set	• Improving efficiency of brush cutters • Maintaining work efficiency of equipment owned by CMAC
8	Mobile Workshop (for brush cutters)	Permissible maximum vehicle weight: not less than 10t, engine: diesel engine, engine horsepower: not less than 140kw, driving type: 4x4, crane capacity: not less than 2.9t, carrier type: aluminum van type, monorail crane capacity: not less than 240kg, mounting: accessories: one set	-	1	1	Substantiating onsite repair of brush cutters by patrolling each site
9	Mobile Workshop (for vehicles)	Permissible maximum vehicle weight: not less than 5.5t, engine: diesel engine, engine horsepower: not less than 75kw, driving type: 4x4, carrier type: aluminum van type, mounting: accessories: one set	-	1	-	Substantiating onsite repair of vehicles by patrolling each site
	Loaded Tools for Vehicle Repair (for vehicle)	One set of vehicle-loaded mechanical tools	-	-	1 set	Substantiating onsite repair of vehicles by loading tools on vehicle presently owned by mechanic
10	PPE (Visor)	Quality: CMAC standard	1500	1500	-	To be purchased in the demining project of CMAC, and shall be removed from the equipment procured
11	GPS	Type: handheld	50	50	-	To be purchased in the demining project of CMAC, and shall be removed from the equipment procured
12	VHF handheld	Type: handheld	100	100	-	To be purchased in the demining project of CMAC, and shall be removed from the equipment procured

No.	Equipment Name	Outline Specifications	Requested Quantity (Request)	Requested Quantity (At signing M/D)	Planned Quantity	Intended Purpose, etc.
13	Equipment for Central Workshop	Set of maintenance and repair facilities and tools	-	1set	-	To be purchased in the technical cooperation project and shall be removed from the equipment procured
Spare Parts for Planned Equip-ment	Periodic Maintenance Parts Consumables	1 set	1 set	1 set	1 set	Preparation for spare parts to smoothly conduct initial operation

2-2-3 Implementation Plan

2-2-3-1 Implementation Policy

(1) Project Implementing Body

The implementing agency of the Project on the Cambodian side is CMAC (Cambodian Mine Action Center) which will operate and maintain the equipment on their own. In accordance with the Grant Aid Scheme, the Japanese-national consultant will carry out a detailed design and procurement supervision and the Japanese-national trading firm(s) as equipment supplier will be the main contractor with respect to procurement of the equipment under the Project.

(2) Consultant

After concluding the Exchange of Notes (E/N) and the Grant Agreement (hereinafter referred to as “G/A”), the Cambodian Mine Action Center (CMAC) will conclude a consultancy agreement with the Japanese consultant with respect to the implementation of the Project. The consultant who concluded the consultancy agreement with CMAC will take responsibility until the completion of delivery of the equipment under the Project by providing engineering services such as preparation of a detailed design of the equipment and tender documents, tender assistance and procurement supervision.

(3) Equipment Supplier(s)

A supplier who has successfully passed the examination and made a successful bid with respect to required quality and specifications through open bidding with limited qualifications will conclude a contract with CMAC with respect to the delivery of the planned equipment. A supplier will deliver the equipment requested by CMAC within

the appointed date of delivery as determined in the contract, carry out adjustment and test run, and provide instructions on initial operation and maintenance of equipment.

2-2-3-2 Implementation Conditions

Although CMAC is well informed about the implementing procedures due to the provision of the equipment related to demining activities granted through Japan's grant aid project throughout four-phase projects from 1998 to 2004, it is necessary to avoid any delays or default by sufficiently providing explanation and discussions at an each implementation stage.

The equipment to be procured from Japan and a third country will be transported by sea and will be unloaded at the Port of Sihanoukville. The equipment will be delivered to the Cambodian side after transporting the equipment overland to the CMAC Training Center in Kampong Chhnang. Equipment suppliers should pay attention to warranties against defects resulting from breakage or theft that may arise during marine transport, overland transport and unloading in order to prevent any problems with the Cambodian side.

2-2-3-3 Scope of works

The procurement until the CMAC Training Center in Kampong Chhnang, which is the place of delivery for the equipment will be undertaken by the Japanese side. The cost of tax exemptions pertaining to importation of the equipment will be undertaken by the Cambodian side. The scope of work between the Cambodian and Japanese sides is shown in Table 2-23

Table 2-23 Scope of Work

Item	Japan	Cambodia	Remarks
1. Equipment Procurement			
Procurement cost	●		
Maine transport cost	●		Place of equipment procurement to Port of Sihanoukville
Inland transport cost	●		Port of Sihanoukville to CMAC Training Center
Equipment unpacking	●		
Equipment adjustment • test run	●		
Guidance on initial operation	●		
Equipment distribution to the project site		●	
2. Tax Exemption		●	

2-2-3-4 Consultant Supervision

(1) Principles of Consultant Supervision

In the case of implementing the Project through the Grant Aid Scheme of the Government of Japan, in the execution of a detailed design and consultant supervision, special attention should be given to the following matters and an implementing system by arranging personnel who have abundant experience in detailed design and consultant supervision.

1. Basic Design Study report
2. Grant Aid scheme
3. Exchange of notes (E/N) concluded between two nations
4. G/A signed between the Japan International Cooperation Agency (JICA) and the Government of Cambodia

In due consideration of the above, the contents of a detailed design, description of consultant supervision, responsible personnel and notes are outlined as follow.

(2) Service Description

Within the services described in the E/N and G/A after signing, the consultancy agreement will be concluded between the consultant and the implementing agency of the Project. The consultant services are outlined as follows.

1) Detailed Design

- Final confirmation of the components of the Project, preparation and discussion of tender documents
- Obtaining approval for tender documents from the Cambodian side
- Tender announcement and distribution of tender documents
- Tender assistance, evaluation and reporting of tender results
- Encouragement of supplier contracts

2) Supervision of Equipment Procurement

- Confirmation of equipment fabrication specifications
- Confirmation of procurement progress
- Witnessing ex-factory inspection and confirmation of pre-shipment inspection
- Equipment adjustment and confirmation of test run

- Confirmation of guidance on initial equipment operation
- On-site acceptance inspection and confirmation of delivery

(3) Supervisor Staffing Plan

1) With respect to manufacture of the equipment to be procured, inspection personnel (one person) will be dispatched to confirm fabrication specifications, whether or not there is a change in equipment specifications and quantities clarified on the basic design study stage at the time of an ex-factory and pre-shipment inspections.

2) After the equipment has arrived at the actual site, a stationed supervisor (one person) will be dispatched to the actual site to supervise a series of work such as unpacking and unloading, equipment adjustment, confirmation of a test run, guidance on initial operation, acceptance inspection and delivery.

3) In the selection of these supervisory personnel, those who have an affluent experience, appropriate technical judgment and better management ability as a prerequisite.

2-2-3-5 Quality Control Plan

In order to confirm that the equipment to be procurement conforms to technical specifications prescribed in the contract, the following inspections will be conducted at each stage.

Ex-factory inspection	:	Confirmation of whether or not the contents of technical specifications conform to the specifications of the equipment manufactured, performance and quantity (Supplier: execution, consultant : confirmation)
Pre-shipment inspection	:	Verification of contents of technical specifications with shipping documents and verification of shipping documents with the equipment (Inspecting agent: execution, consultant: confirmation)
Delivery inspection	:	Confirmation of whether or not the contents of technical specifications conform to the specifications of the equipment after transportation (Supplier: execution, consultant: confirmation)

2-2-3-6 Procurement Plan

(1) Procurement Source

Mine detector and mine/UXO detector equipment will be procured from a third country; whereas, spare parts for brush cutters and mobile workshops will be procured from Japan. There are no particular problems with acquisition, repair and maintenance of the equipment in Cambodia.

Most of the mine detectors and mine/UXO detectors presently utilized at CMAC are produced in Australia, Italy and Germany. As mine detectors and mine/UXO detectors are the equipment utilized in the forefront of demining activities, it is important to become accustomed to the equipment from the viewpoint of safety. In addition, the equipment presently utilized is efficient from the viewpoint of repair and maintenance.

Table 2-24 Procurement Source

Equipment Name		Country of Origin		Remarks
		Japan	Third Country	
Mine Detector	MINELAB F3		●	Limited to Australian products.
	CEIA MIL-D1		●	Limited to Italian products.
Mine/ UXO Detector	EBINGER UPEX 740M		●	Limited to German products.
	CEIA MIL-D1/DS		●	Limited to Italian products.
	FORESTER FEREX-AP1		●	Limited to German products.
Spare Parts	MINELAB F1A4, F1A4UXO, EBINGER UPEX 740M		●	Limited to third country products.
	Brush Cutter Spare parts	●		Limited to Japanese products
Mobile Workshop	For brush cutters with crane	●		
	Mechanic's tools loaded onto vehicle	●		

(2) Spare Parts

Detectors are severely worn due to detecting operations under severe conditions. Based on the onsite work experience, parts for detectors will be newly procured and the existing detectors will be procured mainly for the detector parts with high frequency of trouble, therefore the work efficiency of the granted equipment will be improved. By procuring parts for rotary cutters and suspensions of the existing brush cutters that are severely worn or damaged, the work efficiency of brush cutters will be improved. With respect to spare parts for mobile workshops to be procured, spare parts necessary for initial installation and the first replacement will be procured.

(3) Transportation Route

After unloading the equipment at the Port of Sihanoukville in Cambodia by transporting the Japanese-produced equipment from a Japanese port of loading via the South China Sea, and Australian-produced equipment from a port of loading via the Pacific Ocean and the EU-nation produced equipment via the Indian Ocean, the equipment will be transported. overland and be delivered to the Training Center in Kampong Chhnang. The Japanese side will pay for these transportations until the delivery site of equipment to be procured. Inland transportation will by carried out by trucks on paved national roads. The travel distance will be approximately 350km. The transportation of equipment to the work sites will be undertaken by the Cambodian side according to the implementation plan.

2-2-3-7 Operational Guidance Plan

Under the Project, after the equipment to be procured arrives at the CMAC Training Center in Kampong, an engineer from the manufacturer or engineer from a local agent will carry out unpacking and unloading, equipment adjustment, test runs and guidance on initial operation. The consultant will supervise guidance to be provided by the engineer of a manufacturer or local agent.

Table 2-25 Required Number of Days for Installation Work, Adjustment and Test Runs, Guidance on Initial Operation

Guidance Description	Eligibility	Required Number of Days	
Guidance on adjustment and test run	Mine detector operators, engineers and mechanics	1. Mine detector MINELAB F3-J	4 days
		2. Mine detector CEIA MIL-D1	2 days
		3. Mine/UXO detector EBINGER UPEX 740M	2 days
		4. Mine/UXO detector CEIA MIL-D1/DS	2 days
		5. Mine/UXO detector FORESTER FEREX DLG-STD	2 days
		6. Mobile workshop	1 day
Guidance on initial operation	Mine detector operators	1. Mine detector MINELAB F3-J	10 days
		2. Mine detector CEIA MIL-D1	10 days
		3. Mine/UXO detector EBINGER UPEX 740M	10 days
		4. Mine/UXO detector CEIA MIL-D1/DS	10 days
		5. Mine/UXO detector FORESTER FEREX DLG-STD	10 days
		6. Mobile workshop	1 day

2-2-3-8 Implementation Schedule

The project implementation schedule is illustrated in Figure 2-2 in accordance with Japan's Grant Aid.

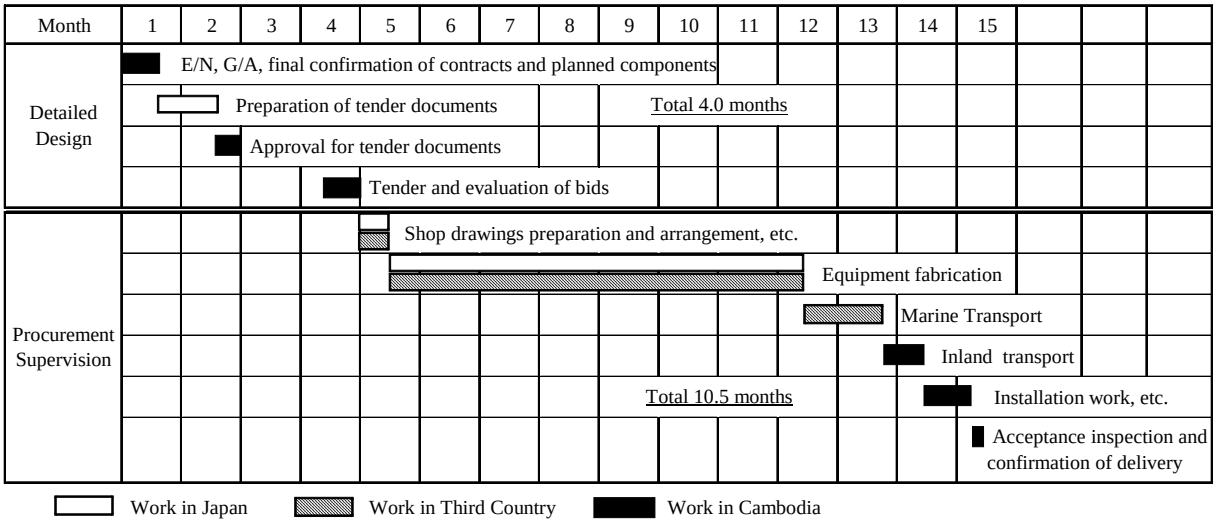


Figure 2-2 Project Implementation Schedule

2-3 Obligations of Recipient Country

In the case of implementing the Project through Japan's grant aid, the Cambodian side is required to implement the following undertakings.

(1) To bear the service charges of a Japanese bank in accordance with the Banking Arrangement (B/A)

(2) To bear service charges for an authorization to pay (A/P)

(3) To provide smooth transportation of equipment to be procured under the Project to the CMAC Training Center in Kampong by preparing exemptions for taxes such as customs duties and imported taxes at the Port of Sihanoukville in advance

(4) To assist Japanese nationals involved in the service of the Project for their entry into and stay in Cambodia

(5) To exempt Japanese nationals from customs duties, local taxes and other surcharges with respect to the services pertaining to the Project

(6) To appropriately and effectively operate and maintain the equipment to be procured under the Project

(7) To bear all expenses other than those borne by the Japanese side as a Japan's grant aid project.

With respect to the above-mentioned (1) and (2), the amount shown in Table 2-26 will be paid as "an administrative cost other than a project-related cost such as HQ expenses" at CMAC. This is approximately 1% of the relevant 2007 budget and is an amount that can be taken.

Table 2-26 Obligations of Recipient Country

No.	Item	Amount (US$)
①	To bear service charges of a Japanese bank in accordance with the Banking Arrangement (B/A)	60
②	To bear service charges for an authorization to pay (A/P)	5,240
	Total	5,300

2-4 Project Operation Plan

The equipment to be procured will be directly managed by the CMAC HQ as in the past and will be allocated to each demining team. The equipment will be allocated based on the demining implementation schedule of each demining team. It is possible to operate without any problem. Although brush cutters and detectors account for a large share of maintenance costs, it is possible to reduce repair costs through detaching parts from deteriorated detectors, reducing use of recycled parts and avoiding excessive use by procuring spare parts. Stock control of spare parts can be also dealt with through the present method. The current equipment maintenance cost is shown in Table 2-27. Although the maintenance cost accounts for 5 to 10% of the CMAC expenditure, this can be reduced since the provision at this time will include the renewal of deteriorated detectors and maintenance equipment and parts which are too expensive. In addition, equipment maintenance is mainly subject to the renewal of detectors presently owned, it is possible for the present mechanics to repair equipment on the technical aspect without any problems.

Table 2-27 Equipment Maintenance Cost

(US$)

	2004	2005	2006	2007
Vehicle-related	522,918.36	422,738.46	506,580.71	757,941.00
Brush Cutters	3,432.22	6,630.87	1,552.76	92,493.42
Detector-related	13,704.60	28,120.70	14,702.30	43,408.99
Radios	42,333.30	24,179.17	36,104.48	34,398.56
Total	582,388.48	481,669.20	558,940.25	928,241.97
Total expenditure	9,844,040.50	9,463,471.73	10,517,711.00	9,113,498.00
Maintenance cost ratio in the total expenditure (%)	5.9	5.1	5.3	10.2

Source: CMAC

Note:

1. Vehicle-related : Vehicles. The office appliances are not included in the above-mentioned classification.
2. Arrival of Phase I, Phase II, Phase III and Phase IV grant aid project was the first half of 2000, April 2001, May 2003 and April 2005 respectively. The procurement of spare parts through the follow-up cooperation was the first half of 2004 and the first half of 2007.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

· Estimation Conditions

1) Estimated date : September 2008

2) Exchange rate : $1 US = ¥106.18, 1 Euro = ¥164.76

3) Procurement period : A period of detailed design and equipment procurement will be approximately 15 months as shown in the Project Implementation Schedule.

4) Other : The cost will be estimated in accordance with the Grant Aid Scheme of the Government of Japan

2-5-2 Operation and Maintenance Cost

The most expensive items after the introduction of the equipment are operation and maintenance. The annual operation and maintenance cost of the equipment to be newly procured, which is necessary in order to carry out the demining activities project, is estimated to be US $167,000 (approximately ¥17.7 million). Although this is approximately 18 % of the 2007 equipment maintenance cost, the current maintenance cost is subject to deteriorated equipment, so maintenance cost can be reduced by replacing with new products. In addition, as the renewal of the presently owned detectors will be mainly subject to equipment improvement, it is possible to reduce maintenance cost with replacement by new products. The estimate of equipment maintenance cost is shown in Table 2-28.

Table 2-28 Estimate of Maintenance Cost

Unit: USD

No	Equipment Name	Model	No. of Units (Note)	Maintenance and Repair Ratio (/unit•year)	Maintenance and Repair Cost (USD/ unit•year)	Annual Maintenance and Repair Cost (USD•total no. of Units /year)
1	Mine Detector	MINELAB F3	388	0.05	253	98,164
2	Mine Detector	CEIA MIL-D1	100	0.05	319	31,900
3	Mine/UXO Detector	EBINGER UPEX 740M	27	0.05	731	19,737
4	Mine/UXO Detector	CEIA MIL-D1/DS	14	0.05	735	10,290
5	Mine/UXO Detector	FOERSTER FEREX 4.032	3	0.05	2,272	6,816
Total			510			166,907

Note: The number of units indicates the number of units to be newly procured.

Estimation Conditions:

(a) Equipment maintenance and repair ratio: Refer to the following notes.

(b) Equipment maintenance and repair cost: Equipment estimated value (CIF price) x equipment maintenance and repair ratio

(c) Cost for spare parts related to maintenance cost: Labor cost is not included because maintenance is conducted through self-workshops, so only parts cost is appropriated.

Total equipment maintenance and repair cost: US$166,900 = approximately ¥17.7million

Note: Although the cost of parts utilized for servicing detectors in 2007 was about US$ 60,000, those parts were provided by each donor organization on a project basis. Other than those, of approximately 189,000 US worth of spare parts for detectors granted by Japan in the Phase IV project in 2005, approximately 20%, or $38,000 US, was utilized. Of the $229,000 US worth of parts provided through follow-up cooperation conducted in 2006, approximately 30%, or $69,000 US, was utilized. Consequently, the cost of parts utilized for maintenance in 2007 was approximately $ 167,000 US (¥17.7 million). The total number of mine detectors and mine/UXO detectors still within their five-year service life is 900 and the total amount is approximately ¥346 million. Accordingly, the ratio of parts cost pertaining to maintenance and repair in 2007 is approximately 5% (17.7 million/¥346 million).

2-6 Other Relevant Issues

Concerning the transportation of procured equipment from the delivery site to each work site, since the Cambodian side will do this according to the implementation plan, the Japanese side should liaise closely with CMAC regarding the timing of handover to ensure that the implementation plan is not impeded.

CHAPTER 3

PROJECT EVALUATION AND RECOMMENDATIONS

CHAPTER 3
PROJECT EVALUATION AND RECOMMENDATIONS

3-1 Project Effects

The following effects are expected through the implementation of the Project.

Table 3-1 Project Effects

Current Situation and Problems	Remedial Measures under the Requested Japanese Assistance	Direct Effects and Degree of Improvement	Indirect Effects and Degree of Improvement
The area of mine clearance is less than 10% so demining in Cambodia is still an urgent task. Although equipment such as detectors is important for demining, in addition to a decline in working efficiency due to deteriorated equipment, the amount of equipment that cannot be used continues to increase. Since the absolute number of units is insufficient, this hinders the implementation of a safe and efficient demining process.	Equipment necessary for CMAC demining activities will be procured.	① Since the shortage of detectors will continue to increase, detectors currently owned that have deteriorated will be renewed, so maintenance and repair will become easier; the efficiency of manual demining operations will be improved; at the same time, the safety of demining personnel will be improved by replacing recycled and deteriorated equipment with new equipment.. ② Demining operations will become more efficient by maintaining and improving the availability of brush cutters.	① Harm to local residents due to landmines and UXO can be reduced. ② Local residents will be able to carry out faming more safely by eliminating the fear of landmines and UXO which will contribute to revitalization of the regional economy and poverty reduction. ③ The Project will help to encourage the conversion to an ongoing one-man one-lane operation method, which is favorable for better work efficiency.

3-2 Recommendations

(1) Recommendations to be taken by the Recipient Country

In order to secure continued effects and sustainable development through the implementation of the Project, the recipient country is required to observe the following recommendations.

- The demining activities plan under the Project is a long-term plan so the recipient country is required to be financially independent. The CMAC relies on aid from UN organizations, bilateral donors and NGOs for more than 90% of the budget for demining activities, and due to budget limitations and an increase in the budget of the Government of Cambodia, at the present time contracted mine clearance projects for on-going mine development and financial self-efforts should be actively accepted through the dispatching of experts under the South-South Cooperation.
- Due to the limited budget, better work efficiency should be promoted in order to improve cost performance while ensuring operational safety.
- Owned equipment should be utilized effectively by taking measures to ensure appropriate maintenance and extending service life, to secure maintenance expenses and continued renewal of owned equipment that has unavoidably become deteriorated as a result of severe utilizing conditions.

(2) Technical Cooperation and Coordination with Other Donors

- Since 2008, for the purpose of achieving human security through technical cooperation, the Project on strengthening of CMAC's function for human security realization has been implemented in order to improve organizational operations, workshop management, training management and an IT system. If the equipment is appropriately maintained and training for the demining personnel who utilize the equipment is substantiated jointly with technical cooperation, the efficiency of the demining activities depending on the equipment can be expected

- As described earlier, since the budget for CMAC's activities is dependent on the assistance of other donors, assistance similar to the current conditions will at least be continued. and the majority of aid is invested toward operating expenses for demining activities.However, as the maintenance cost associated with equipment to be procured is also included, additional financial support to ensure appropriate maintenance of equipment utilized by individual projects should be provided through the assistance and collaboration of other donors. Support for renewal of deteriorated equipment that cannot be used is also necessary and requested

APPENDICES

APPENDIX 1
MEMBER LIST OF THE STUDY TEAM

(1) Basic Design Study

1. Mr. Toshiyuki Iwama, Leader
   Japan International Cooperation Agency
   Grant Aid and Loan Support Dept.

2. Mr. Huyuki Sagara, Project Coordinator
   Japan International Cooperation Agency
   Grant Aid and Loan Support Dept.

3. Mr. Yukio Kohsaka, Chief Consultant / Management Planning
   Construction Project Consultants, Inc.

4. Mr. Tsuyoshi Inoue, Machinery Planning 1
   Construction Project Consultants, Inc.

5. Mr. Koji Koga, Machinery Planning 2 / Procurement Planning / Cost Estimate
   Construction Project Consultants, Inc.（Mitsui Consultants Co., Ltd.）

(2) Draft Basic Design Study

1. Mr. Kazuhiro Yoneda, Leader
   Japan International Cooperation Agency Cambodia Office

2. Mr. Hideki Ito, Project Coordinator
   Japan International Cooperation Agency
   Transportation and ICT Division II Transportation and ICI Group Economic Infrastructure Dept.

3. Mr. Yukio Kohsaka, Chief Consultant / Management Planning
   Construction Project Consultants, Inc.

4. Mr. Tsuyoshi Inoue, Machinery Planning 1
   Construction Project Consultants, Inc.

5. Mr. Yasuhiro Okubo, Machinery Planning 2 / Procurement Planning / Cost Estimate
   Construction Project Consultants, Inc.

APPENDIX 2
STUDY SCHEDULE

(1) Basic Design Study

Schedule			Official Team Member (JICA)		Consultant (Construction Project Consultants, Inc.)		Mitsui Consultants Co., Ltd.	Consultant Overnight Stay
Day No.	Date	Day of Week	1 Leader (Toshiyuki Iwama)	2 Project Coordinator (Huyuki Sagara)	3 Chief Consultant/Management Planning (Yukio Kosaka)	4 Machinery Planning 1 (Tsuyoshi Inoue)	5 Machinery Planning 2/Procurement Planning / Cost Estimate (Koji Koga)	
1	Aug. 21	Thu.		Transit (Air) NRT-> Bangkok ->Phnom Penh	Transit (Air) NRT (11:00TG641)->Bangkok (15:30) Bangkok (17:30TG698)->Phnom Penh (18:45)			Phnom Penh
2	Aug. 22	Fri.		Courtesy visit to Japanese Embassy, JICA, CMAC・explanation of inception report (under presence at embassy)				Same as above
3	Aug. 23	Sat.		Explanation of inception report, discussion with CMAC on question items ・study schedule				Same as above
4	Aug. 24	Sun.		Phnom Penh→Battambang				Battambang
5	Aug. 25	Mon.		DU2 demining survey, research site observation, central workshop survey, visit to DU2 office				Same as above
6	Aug. 26	Tue.		Battambang PMAC survey →Kampong Chhnang(training center survey)→Phnom Penh, agent survey				Phnom Penh
7	Aug. 27	Wed.		Discussions with CMAC, CMAA				Same as above
8	Aug. 28	Thu.	Transit (Air) NRT -> Bangkok->Phnom Penh	Discussions with CMAC, M/D, discussions with other donors, private-sector maintenance conditions, agent survey				Same as above
9	Aug. 29	Fri.	Discussion with Ministry of Finance, CMAC (M/D signing), CMAC survey (Transit Phnom Penh (19:45TG699)→Bangkok(20:50), Bangkok(23:50TG642)					Same as above
10	Aug. 30	Sat.	Data arrangement, team meeting	Transit (Air) Bangkok -> NRT(08:10)	Data arrangement, team meeting			Same as above
11	Aug. 31	Sun.	Other matters		Data arrangement, team meeting			Same as above
12	Sept. 1	Mon.	Report to Japanese Embassy, JICA		Report to Japanese Embassy, JICA	Transit (Land) Phnom Penh>Kampong Chhnang ERO survey, site survey ->Transit (Land) Phnom Penh, agent survey		Same as above
13	Sept. 2	Tue.	Other matters		CMAC survey	CMAC survey		Same as above
14	Sept. 3	Wed.			CMAC survey	Transit (Land) Phnom Penh→Pailin(DU3)		Phnom Penh/Pailin
15	Sept. 4	Thu.			CMAC HQ training・R/D survey, CMAA survey	DU3 office survey, site survey Transit (Land) Pailin→Battambang		Phnom Penh/Battambang
16	Sept. 5	Fri.			Survey of concerned parties such as other donors/NGOs	Transit (Land) Battambang ->Banteay Meanchery DU1 office survey, site survey		Phnom Penh/Banteay Meanchery
17	Sept. 6	Sat.			CMAC survey	Transit (Land) Banteay Meanchery->Siem Reap		Phnom Penh/Siem Reap
18	Sept. 7	Sun.			Data arrangement, team meeting	Data arrangement, team meeting		Same as above
19	Sept. 8	Mon.			Survey of concerned parties such as other donors/NGOs	Transit (Land) Siem Reap->ｺｹｲ(site)->Siem Reap DU4 office survey, Site survey		Same as above
20	Sept. 9	Tue.			Survey of concerned parties such as other donors/NGOs	Transit (Land) Siem Reap->ｺｳｸｺｳﾎﾞｽ(site)->Siem Reap DU6 site survey		Same as above
21	Sept. 10	Wed.			CMAC survey	DU6 office survey, other donors survey Transit (Land) Siem Reap>Phnom Penh		Phnom Penh
22	Sept. 11	Thu.			Private-sector maintenance・parts conditions survey	Agent conditions survey		Same as above
23	Sept. 12	Fri.			CMAC survey, other donors survey			Same as above
24	Sept. 13	Sat.			CMAC survey			Same as above
25	Sept. 14	Sun.			Data arrangement, team meeting			Same as above
26	Sept. 15	Mon.			Agent survey, other donors survey			Same as above
27	Sept. 16	Tue.			Transit (Land) Phnom Penh<->Port of Sihanoukville transport・customs conditions survey transportation survey (transporters)			Same as above
28	Sept. 17	Wed.			CMAC survey, private plant survey			Same as above
29	Sept. 18	Thu.			Discussions with CMAC (discussion on technical notes), agent survey			Same as above
30	Sept. 19	Fri.			Discussions with CMAC (signing of technical notes)			Same as above
31	Sept. 20	Sat.			Agent survey			Same as above
32	Sept. 21	Sun.			Local maintenance conditions survey, data arrangement			Same as above
33	Sept. 22	Mon.			Report to Japanese Embassy, JICA, agent survey Transit (Air) Phnom Penh(19:45TG699)-> Bangkok(20:50)Bangkok(22:10TG640)-			On board
34	Sept. 23	Tue.			NRT(06:20)			

(2) Explanation of Draft Basic Design

<table>
<tr><th colspan="3">Schedule</th><th colspan="2">Official Team Member (JICA)</th><th colspan="3">Consultant (Construction Project Consultants, Inc.)</th></tr>
<tr><th>Day No.</th><th>Date</th><th>Day of Week</th><th>1
Leader
(Kazuhiro Yoneda)</th><th>2
Project Coordinator
(Hideki Ito)</th><th>3
Chief Consultant/Management Planning
(Yukio Kosaka)</th><th>4
Machinery Planning 1
(Tsuyoshi Inoue)</th><th>5
Machinery Planning 2/Procurement Planning/Cost Estimate
(Yasuhiro Okubo)</th></tr>
<tr><td>1</td><td>Dec. 14</td><td>Sun.</td><td></td><td colspan="4">Transit (Air) NRT(10:30 VN951)->Ho Chi Minh(14:55)
Ho Chi Minh(17:15 VN819)->Phnom Penh(18:05)</td></tr>
<tr><td>2</td><td>Dec. 15</td><td>Mon.</td><td colspan="5">Discussions with JICA office in Cambodia, explanation of draft basic design report,
courtesy visit to CMAC, explanation of draft basic design report, discussions</td></tr>
<tr><td>3</td><td>Dec. 16</td><td>Tue.</td><td colspan="5">Discussions with CMAC, explanation of draft basic design report, discussion on technical notes</td></tr>
<tr><td>4</td><td>Dec. 17</td><td>Wed.</td><td colspan="5">Discussions with CMAC on M/D, discussion on technical notes</td></tr>
<tr><td>5</td><td>Dec. 18</td><td>Thu.</td><td colspan="5">Discussions with CMAC on M/D, signing of M/D, signing of technical notes, report to Japanese Embassy in Cambodia</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Dec. 19</td><td rowspan="2">Fri.</td><td rowspan="3"></td><td colspan="2">CDC survey</td><td rowspan="2" colspan="2">Discussions with CMAC.
Data arrangement</td></tr>
<tr><td>Transit (Air) Phnom Penh(18:50 VN816)->Ho Chi Minh(19:40)</td><td>Discussions with CMAC.
Data arrangement</td></tr>
<tr><td>7</td><td>Dec. 20</td><td>Sat.</td><td>Ho Chi Minh(00:05 VN950)
->NRT(07:30)</td><td colspan="3">Transit (Air) Phnom Penh(18:50 VN816)->Ho Chi Minh(19:40)</td></tr>
<tr><td>8</td><td>Dec. 21</td><td>Sun.</td><td></td><td colspan="3">Ho Chi Minh(00:05 VN950)
->NRT(07:30)</td></tr>
</table>

APPENDIX 3
LIST OF PARTIES CONCERNED IN THE RECIPIENT COUNTRY

(1) Embassy of Japan in the Kingdom of Cambodia

Hideaki MATSUO : First Secretary
Satoshi MITSUKURI : First Secretary

(2) JICA Cambodia Office

Kazuhiro YONEDA : Resident Representative
Hiroyuki UKAI : Deputy Resident Representative
Shigeki MIYAKE : Office Staff

(3) Royal Government of Cambodia

Name	Position	Authority
KHEM SOPHOAN	Director General	CMAC HQ
HENG RATANA	Deputy Director General	CMAC HQ
LENG CHREANG	Director of Support and Human Resources	CMAC HQ
KHUN RATANA	Chief of Secretariat	CMAC HQ
OUM PHUMRO	Director of Planning and Operations	CMAC HQ
EK BOLIN	Director of Finance	CMAC HQ
ROATH KANITH	Director of Training research and Development	CMAC HQ
MEAN PHEARONG	Transport and Maintenance Officer	CMAC HQ
RYOJI YAGINUMA	Chief Adviser(JICA), Corporate Management	CMAC HQ
CHAN SAMBATH	Project Manager	CMAC HQ
NHEP SOUR	General Manager	CMAC Central Workshop
KAZUHIKO KAMACHI	Workshop Advisor (JICA)	CMAC Central Workshop
MONG SOKUNTHEARATH	Project Manager	CMAC Training Center
SEAM HAK	Deputy Manager	DU 1
PRING PANHARITH	Manager	DU 2
CHHIM SOVANNY	Deputy Manager	DU 3
RATH POTTANA	Manager	DU 4
YOSHITAKA YAMADA	Technical Adviser (Volunteer)	DU 4
MEAN SARUN	Manager	DU 6
PETER WILLERS	Program Manager (German)	DU 6
CHENG RADY	Manager	ERO
SAM SOTHA	Ambassador	CMAA
LENG SOCHEA	Deputy Secretary General	CMAA
CHAN ROTHA	Director	CMAA Department of SEPD
IN CHANNA	Database Unit Manager	CMAA
POR YUTHA	Chief of Division	Ministry of Economical and Finance
EL SAY	Deputy Governor of Battambang Province	PMAC Battambang
BUON LIMHENG	Adviser for the Council of Minister and Director of Finance and Logistic Department	Council of Minister

(4) Others

Name	Position	Authority
KATHERINE MITCELL	Second Secretary Development Cooperation	Aus AID Australian Embassy
AMY L, CANON	Second Secretary	USA Embassy
STEVE MUNROE	Program Manager	UNDP
TADAFUMI YAMAMOTO	Resident Representative	JMAS Cambodia Office
YOSHIKO SATO	Administrator	JMAS Cambodia Office
KAZUMI KUBOTA	Coordinator	KUSANONE Grant、EOJ
RUNE ENGESET	Regional Program Manager	Norwegian People's Aid
RUPERT LEIGHTON	Country Program Manager	MAG
STEFAN KARLSSON	Director	Swedish Detector Systems (CEIA)
VERA BOHLE	Evaluation and Disarmament Specialist	DU6 Evaluation Team
FINN VIGGO GUNDERSEN	General Manager	ENCOTEC Co., Ltd.
JIMMI C. VICTORIA	General Manager	Sideband Communication & Engineering Service (Minelab)
MICHAEL GABEL	General Manager	QAsia (Ebinger)
BUN SOPHAL	Assistant to General Manager	KTM Co., Ltd.(Komatsu)
TAN KIM VENG	General Manager	Metro Group of Cambodia Co., Ltd.(Cat)

APPENDIX 4
MINUTES OF DISCUSSIONS (M/M)

A4-1

Minutes of Discussions
on the Basic Design Study
on the Project for Improvement of Equipment for Demining Activities (Phase V)
in the Kingdom of Cambodia

In response to the request from the Government of the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of Equipment for Demining Activities (Phase V) (hereinafter referred to as "the Project") in Cambodia and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Cambodia the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Toshiyuki IWAMA, Director, Project Study Division I, Grant Aid and Loan Support Department, JICA, and is scheduled to stay in the country from August 21st, 2008 to September 22nd, 2008.

The Team held a wide range of consultations and discussions with the officials concerned of the Government of Cambodia and conducted a field survey at the study area. In the course of the discussions and field survey, both parties confirmed the main items described in the attached sheets. The Team will proceed to further study and prepare the Basic Design Study Report.

Phnom Penh, August 29th, 2008

Toshiyuki IWAMA
Leader
Basic Design Study Team
Japan International Cooperation Agency

Heng Ratana
Deputy Director General
Cambodian Mine Action Centre
Kingdom of Cambodia

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve demining and Unexploded Ordnance (UXO) clearance activities of Cambodian Mine Action Centre (hereinafter referred to as "CMAC"), through procurement of necessary equipment.

2. Project Site

The project sites are CMAC Headquarters, Central Workshop, Training Center, and all the activities area of the Demining Units (DUs) and Eastern Regional Office (ERO) as shown in Annex-1.

3. Responsible and Implementing Agency

The responsible and implementing agency is CMAC. The organization chart of CMAC is shown in Annex-2.

4. Items Requested by the Government of Cambodia

4.1 After discussion with the Team, the items described in the list on Annex-3 were finally requested by the Cambodian side.

4.2 The Cambodian side also explained the priority of the requested components as described in the list on Annex-3.

4.3 The Cambodian side strongly requested that 300 units of Mine Detector (model: MINELAB F3), 41 units of Mine/UXO Detector (24 units of Ebinger UPEX 740M, 14 units of CEIA DS, and 3 units of Forestar Ferex) should be procured as a minimum demand of the Project. The second minimum demand is that the number of the above each unit would be increased and additionally the number of Mine Detector (model: CEIA D1) would be added, and also the number of PPE Vest and Spare parts would be added respectively.

The third minimum demand is that further number of detectors, Mobile Workshop for Brush Cutter (with crane) and the number of PPE Visor would be added.

4.4 The Team will assess the appropriateness of each component of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

5.1 The Cambodian side understood the Japan's Grant Aid scheme explained by the Team as described in Annex-4.

5.2 The Cambodian side will take necessary measures, as described in Annex-5, for smooth implementation of the Project.

6. Schedule of the study

6.1 The Team will proceed to conduct further study in Cambodia until September 22nd, 2008.

6.2 The Team will prepare the draft report of the study in English and dispatch a mission to Cambodia in order to explain its contents in December 2008.

6.3 In case that the contents of the report are accepted in principle by the Government of Cambodia, JICA

will complete the final report and submit it to the Government of Cambodia around February, 2009.

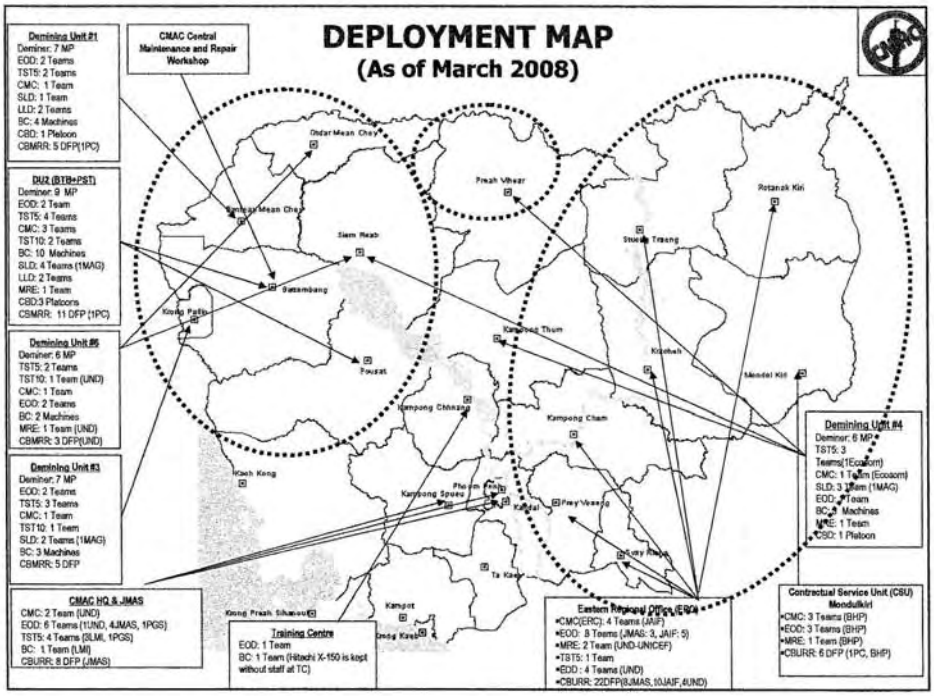
7. Other Relevant Issues

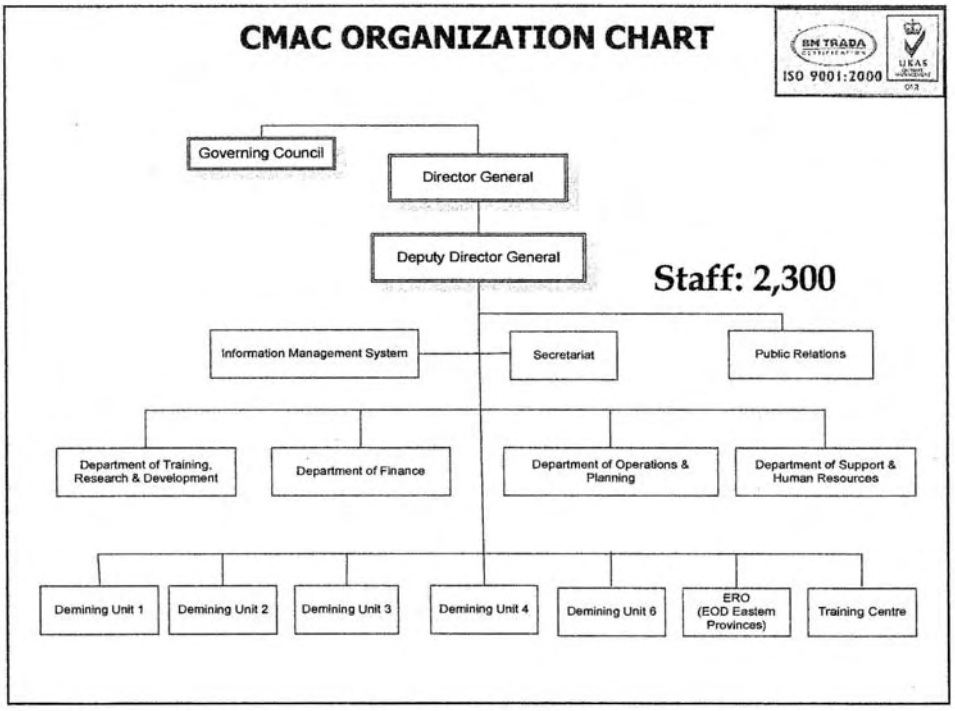
7.1 Both sides agreed that equipment plan should be formulated focusing on the following factors.
-Direct contribution to manual demining/UXO clearance
-Maintaining and improving the efficiency of the existing brush cutters

7.2 Regarding the Mobile Workshop for vehicle, the Team suggested that it is possible to utilize the exiting vehicle instead of newly procuring Mobile Workshop, considering the contents of repair work for vehicles, and the Team will examine further if the Mobile Workshop for vehicles is practically necessary or not. The Cambodian side understood it.

7.3 Regarding Spare Parts, the Team explained that only the parts related to the rotary attachment of brush cutter need to be studied as component of the Project from the viewpoint of the urgent needs and the essential factor of equipment plan described in 7.1. The Cambodian side emphasized that the spare parts of detectors should be given the same priority as the rotary attachment of brush cutter, and other spare parts should also be considered as second priority. The Team will take it into consideration along the study.

7.4 Regarding the detectors, the Cambodian side requested that the specified models as described in Annex-3 should be procured. The Team explained that in case of procuring specified models under Japan's Grant Aid, the Cambodian side shall provide a practical and rational explanation to clarify the specified model is the only one model which exists and matches the performance and usage required by CMAC. And the Team required the official document regarding such explanation until September 10th, 2008. The Cambodian side agreed to it.


DEPLOYMENT MAP
(As of March 2008)
Demining Unit #1
Deminer: 7 MP
EOD: 2 Teams
TST5: 2 Teams
CMC: 1 Team
SLD: 1 Team
LLD: 2 Teams
BC: 4 Machines
CBD: 1 Platoon
CBMRR: 5 DFP(1PC)
CMAC Central Maintenance and Repair Workshop
DU2 (BTB+PST)
Deminer: 9 MP
EOD: 2 Team
TST5: 4 Teams
CMC: 3 Teams
TST10: 2 Teams
BC: 10 Machines
SLD: 4 Teams (1MAG)
LLD: 2 Teams
MRE: 1 Team
CBD:3 Platoons
CBMRR: 11 DFP (1PC)
Demining Unit #6
Deminer: 6 MP
TST5: 2 Teams
TST10: 1 Team (UND)
CMC: 1 Team
EOD: 2 Teams
BC: 2 Machines
MRE: 1 Team (UND)
CBMRR: 3 DFP(UND)
Demining Unit #3
Deminer: 7 MP
EOD: 2 Teams
TST5: 3 Teams
CMC: 1 Team
TST10: 1 Team
SLD: 2 Teams (1MAG)
BC: 3 Machines
CBMRR: 5 DFP
CMAC HQ & JMAS
CMC: 2 Team (UND)
EOD: 6 Teams (1UND, 4JMAS, 1PGS)
TST5: 4 Teams (3UMI, 1PGS)
BC: 1 Team (UMI)
CBURR: 8 DFP (JMAS)
Training Centre
EOD: 1 Team
BC: 1 Team (Hitachi X-150 is kept without staff at TC)
Eastern Regional Office (ERO)
•CMC(ERC): 4 Teams (JAIF)
•EOD: 8 Teams (JMAS: 3, JAIF: 5)
•MRE: 2 Team (UND-UNICEF)
•TST5: 1 Team
•EDD : 4 Teams (UND)
•CBURR: 22DFP(8JMAS,10JAIF,4UND)
Demining Unit #4
Deminer: 6 MP
TST5: 3
Teams(1Ecosom)
CMC: 1 Team (Ecosom)
SLD: 3 Team (1MAG)
EOD: 1Team
BC: 3 Machines
MRE: 1 Team
CSO: 1 Platoon
Contractual Service Unit (CSU)
Mondulkiri
•CMC: 3 Teams (BHP)
•EOD: 3 Teams (BHP)
•MRE: 1 Team (BHP)
•CBURR: 6 DFP (1PC, BHP)
Preah Vihear
Rotanak Kiri
Siem Reab
Stoeng Treang
Kampong Thum
Kratie
Mondol Kiri
Kampong Cham
Kampong Chhnang
Koh Kong
Kampong Speu
Phnom Penh
Prey Veaeng
Svay Rieng
Ta Keo
Kampot
Kong Preah Sihanouk
Pursat
Banteay Mean Chey
Batambang
Kong Pailin


CMAC ORGANIZATION CHART
ISO 9001:2000
Governing Council
Director General
Deputy Director General
Staff: 2,300
Information Management System
Secretariat
Public Relations
Department of Training, Research & Development
Department of Finance
Department of Operations & Planning
Department of Support & Human Resources
Demining Unit 1
Demining Unit 2
Demining Unit 3
Demining Unit 4
Demining Unit 6
ERO (EOD Eastern Provinces)
Training Centre

Annex-3

ITEMS REQUESTED BY THE GOVERNMENT OF CAMBODIA

AND THE PRIORITY OF THE REQUESTED COMPONENTS

(Units)

No	Item	Model	Request Aplication	Additional Request	Final Request	Priority
1	Mine Detector		400	+100	500	A
		MINELAB F3		400	400	A
		CEIA D1		100	100	A
2	Mine/UXO Detector		80	+50	130	A
		Ebinger UPEX 740M		77	77	A
		CEIA DS		47	47	A
		Forestar Ferex		6	6	A
3	PPE Vest	CMAC Standard	500	+500	1,000	B
4	Spare Parts			+1 set	1 set	B
5	Mobile Workshop	For Brush Cutter (with crane)		+1	1	B
		For Vehicle (without crane)		+1	1	B
6	PPE Visor	CMAC Standard	1,500		1,500	B
7	GPS		50		50	C
8	VHF Handheld		100		100	C
9	Equipment for Central Workshop			+1 set	1set	C

Annex-4

Japan's Grant Aid

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

1 Grant Aid Procedures

Japan's Grant Aid Scheme is executed through the following procedures.

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

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

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

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

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

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

2 Basic Design Study

1) Contents of the Study

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

- Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.

- Confirmation of items agreed upon by both parties concerning the basic concept of the project.
- Preparation of a Basic Design of the Project.
- Estimation of cost of the Project.

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

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

2) Selection of Consultants

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

3 Japan's Grant Aid Scheme

1) Exchange of Notes (E/N)

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

2) "The period of the Grant Aid" means the one fiscal year in which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consulting firm(s) and (a) contractor(s) and final payment to them must be completed.

However, in case of delays in delivery, installation or construction due to unforeseen factors such as natural disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

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

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

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

4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts

denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

5) Undertakings required to the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

① To secure land necessary for the sites of the project and to clear, level and reclaim the land prior to commencement of the construction,
② To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
③ To secure buildings prior to the procurement in case the installation of the equipment,
④ To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
⑤ To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
⑥ To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

6) "Proper Use"

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

7) "Re-export"

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

8) Banking Arrangement (B/A)

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

9) Authorization to Pay (A/P)

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

Annex-5

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To bear the following commissions to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•
2	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan the recipient	•	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the project site	(•)	(•)
3	To accord Japanese nationals, whose service may be required in connection with the supply of the products and the services under the verified contract, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		•
4	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		•
5	To maintain and use properly and effectively the facilities contracted and equipment provided under the Grant Aid		•
6	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation and installation of the equipment		•

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

A4-2

Minutes of Discussions
on Basic Design Study
on the Project for Improvement of Equipment for Demining Activities (Phase V)
in the Kingdom of Cambodia
(Explanation of Draft Final Report)

In August 2008, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Improvement of Equipment for Demining Activities (Phase V) (hereinafter referred to as "the Project") to Kingdom of Cambodia (hereinafter referred to as "Cambodia"), and through discussions, field survey and technical examination of the results in Japan, JICA prepared a draft final report of the study.

In order to explain and to consult with Cambodian side on the contents of the draft report, JICA sent to Cambodia the Basic Design Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Kazuhiro YONEDA, Resident Representative of JICA Cambodia Office, from December 14 to December 19, 2008.

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

Phnom Penh December 18, 2008

Kazuhiro YONEDA
Leader
Basic Design Explanation Team
Japan International Cooperation Agency

Heng Kalana
Deputy Director General
Cambodia Mine Action Center
Kingdom of Cambodia

ATTACHMENT

1. Components of the Draft Report

The Cambodian side agreed and accepted in principle the contents of the draft report of Basic Design Study by the Team.

The list of equipment is attached to Annex-1.

The final decision will be made by the Government of Japan based on the examination of the result of the Basic Design.

2. Cost Estimation

Both sides agreed that the Project Cost Estimation as attached in Annex-2 should never be duplicated or released to any third parties before the signing of all the Contract(s) for the Project.

3. Japan's Grant Aid Scheme

3-1 The Cambodian side understood the Japan's Grant Aid scheme explained by the Team.

3-2. The Cambodian side will take necessary measures, as described in Annex-5 of the Minutes of Discussions of the Project which is signed on August 29th ,2008 between both sides, for smooth implementation of the Project as a condition for the Japan's Grant Aid to be implemented.

3-3 The Team explained to the Cambodian side that the undertaking of the internal transportation from the port of disembarkation to CMAC's Training Center in Kampong Chhnang should be covered by Grant Aid. Besides, the internal transportation from the Training Center to the work site will be conducted by Cambodian side.

4. Schedule of the Study

JICA will complete the Final Report in English, in accordance with the confirmed items and send it to the Cambodian side by the end of March, 2009.

5. Other Relevant Issues

5-1 The Team handed one copy of the draft final detailed specifications of the equipment to the Cambodian side, and these shall be confidential to third parties in order to secure the fairness of the tender of the Project.

5-2 The equipment procured by the Grant Aid should be used properly and effectively for a reasonable period of time. When it becomes unusable for operations after that, Cambodian side is required to consult with the Embassy of Japan before it is disposed, transferred, or used for other purposes.

Annex-1 : List of Equipment

Annex-2 : Cost Estimation of the Project

Annex-1

List of Equipment

No	Equipment Name	Outline Specification	Quantity
1	Mine Detector	Total	488
		MINELAB F3	388
		CEIA MIL- D1	100
2	Mine/UXO Detector	Total	44
		EBINGER UPEX 740M	27
		CEIA MIL-D1/DS	14
		FOERSTER FEREX 4.032	3
3	Spare Parts	Rotary cutters for owned brush cutter, suspension and spare parts for owned mine detectors and mine/UXO detectors	1 set
4	Mobile Workshop	For brush cutter with crane	1
5	Loaded Tools for Vehicle Repair	Tools for mechanics loaded on to vehicles	1set

Annex-2

Cost Estimation of the Project

This page is closed
due to the confidentiality.

APPENDIX 5
REFERENCES

	Document Title
1	Annual Report 2007
2	Mine Action Planning Unit (MAPU)
3	INTEGRATED WORK PLAN 2008
4	The National Strategic Development Plan, 2006-2010 (NSDP)
5	THE CMAA ROAD MAP 2008
6	MINE ACTION ACHIEVEMENTS REPORT 2007 AND WORK PLAN 2008
7	Cambodia Mine/UXO Victim Information System Monthly Report July 2008 and June 2008
8	CD, Project Library Capacity Building for Mine Action Planning Project
9	What is Cambodian Mine Action Centre
10	Contractual Agreement Between CMAC and UNDP
11	AGREEMENT UNDP Project Proposal 2008
12	UNDP PROJECTPROPOSAL 2008
13	Monthly Statistic Report CMAC Demining Unit-3 Pailin for the Month of August 2008
14	Tariff for port handling charge
15	Professional Services Product Training Fixed Asset Register
16	Human Resources Policy Manual of the Cambodian Mine Action Centre
17	Explosive Remnants of War (ERW) Standing Operating Procedures (SOP's)
18	Internal Metal Detector Trials
19	Cost-benefit Analysis of Mine Clearance Operations in Cambodia
20	Standard Operation Procedures Manual Dmining Use of Mine Detector
21	Standard Operation Procedures Manual Dmining Use of Minelab F1A4
22	Standard Operation Procedure Brush Cutter (BC) or Mechanical Clearance Machine
23	SIGNATURE PAGE Cambodia
24	Ex-Ante Evaluation and Pre-Feasibility Study Report on Project on Strengthening of CMAC's Function for Human Security Realization