The Kingdom of Cambodia
The Cambodian Mine Action Centre

Preparatory Survey Report on The Project for Improvement of Equipment for Demining Activities (Phase VI) in the Kingdom of Cambodia

March 2011

Japan International Cooperation Agency

INGEROSEC Corporation

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Preface

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on the Project for Improvement of Equipment for Demining Activities (Phase VI) in the Kingdom of Cambodia, and organized a survey team headed by Mr. Yukio KOHSAKA of INGEROSEC Corporation from October 20, 2010 to November 5, 2010.

The survey team held a series of meetings with the officials concerned of the Royal Government of Cambodia, and conducted a field reconnaissance in the project target areas. As a result of further studies in Japan, the present report was finalized.

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

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

March 2011

Mr. Hiroaki Nakagawa

Director General

Public Policy Department

Japan International Cooperation Agency

Summary

Summary

1. Overview of the Recipient Country

The Kingdom of Cambodia (hereinafter referred to as “Cambodia”) is located a little southwest of the center of the Indochina Peninsula. It borders Thailand, Laos, Viet nam on the northwest, north and southeast, respectively. Its land is approximately 560 km long and 440km long in the east-west and north-south directions, respectively, and has the total area of 181,035 km^2, which is approximately half and one third of the total areas of Japan and Thailand, respectively. The population of Cambodia is approximately 13,400,000 (The Government statistics, 2008). Its capital is Phnom Phen. Only 19.7 % of its people live in urban areas (UNESCO, 2005) and the remaining 80 % live in rural areas.

The Mekong River flows from north to south in the east of the Central Plain and the Lake Tonle Sap is located in the west of the Central Plain. Cambodia is located in the tropical monsoon climate zone and has a rainy season and a dry season in a year. In the latter, a hot season (from early February to mid-May) and a cool season (from early November to late January) can be recognized.

In terms of economy, although GDP of US$ 10.8 billion (Data of IMF, 2009) and per capita GNI of US$ 490 (The World Bank, 2006) of Cambodia are still smaller than corresponding figures of the neighboring countries, the economy has been growing steadily as exemplified by the relatively low unemployment rate of 1.8 % (between 1996 and 2005, UNDP).

Agricultural land and forests occupy most of the land of Cambodia. Agriculture, fisheries and forestry are the major industries of the country. Agriculture, in particular, produces approximately 30 % of GDP and employs 70 % of the work force (between 1996 and 2005, UNDP). The tourism and service industries, agriculture and the mining and manufacturing industries produce 38.5 %, 31.7 % and 23.8 %, respectively, of GDP (Data of the Royal Government of Cambodia, 2008).

2. Background and Outline of the Requested Assistance

(1) Overall Goal

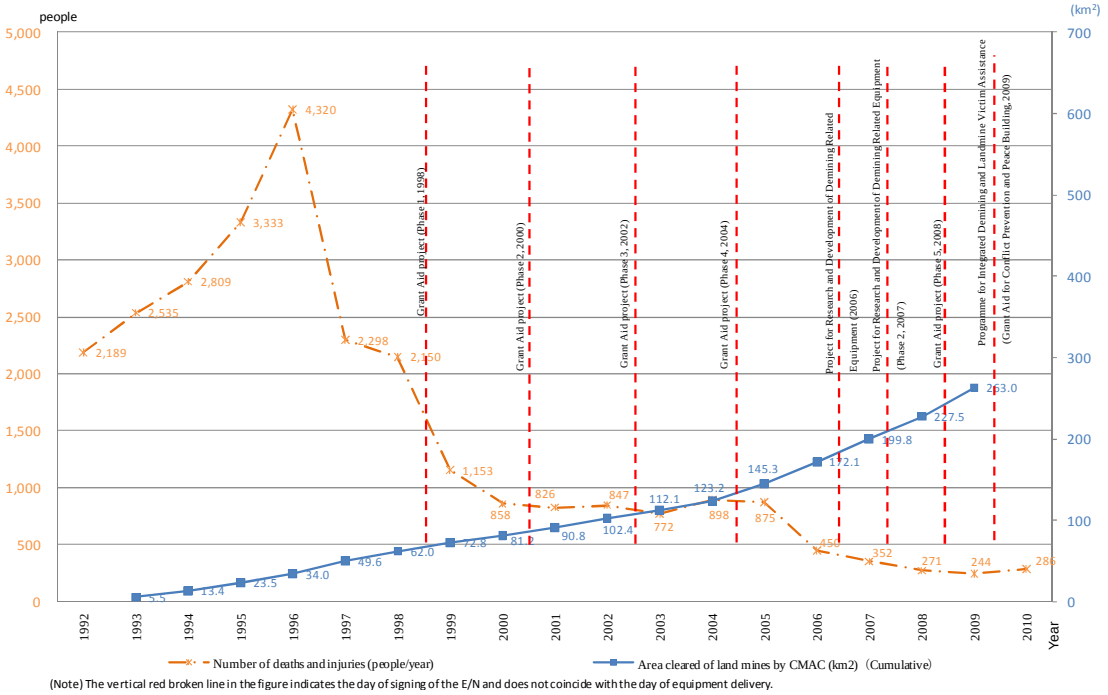
The Roual Government of Cambodia considers the clearance of landmines and unexploded ordnance (UXO) as a priority item in "Agricultural Sector Development," one of the four pillars of the Cambodian National Development Plan announced in 2008, and recognizes it as an urgent task to be accomplished from the viewpoint of

socio-economic development and human security. Furthermore, the "Cambodia Millennium Development Goals" established in 2005 set goals for the number of mine victims (down from 797 persons per year in 2005 to 125 persons per year in 2015) and the ratio of cleared area (up from 30% in 2005 to 87% in 2015).

The Royal Government of Cambodian ratified the "Anti-Personnel Mine Ban Treaty" in 1999 and carried out landmine contamination surveys (landmine technical surveys) and demining in pursuit of the clearance of buried mines within 10 years, as required by the Treaty. However, since it was deemed difficult to remove the mines within this time limit, the government applied for an extension of 10 years as stipulated in the Treaty, and the time limit for implementation was extended to the end of 2019. In addition, the Cambodian Mine Action and Victim Assistance Authority (CMAA), a regulatory organization for demining, took the initiative of putting together a "National Strategy For Mine Action 2010-2019," which was officially adopted in November 2010. While demining is considered to be completed when a hand-over certificate is issued, this Strategy states that from 2010 demining work is required to conduct full clearance of an area of 648.8 km^2, and release an estimated area of 1,097.8 km^2 through the landmine technical surveys. This will require an estimated budget of 455 million dollars.

(2) Present Conditions and Problems in This Sector

The annual number of mine and UXO victims in Cambodia peaked at 4,320 in 1996 and has been on the decline ever since as shown in Figure-1. In 2010, however, there



(Note) The vertical red broken line in the figure indicates the day of signing of the E/N and does not coincide with the day of equipment delivery.

Figure-1 Changes in the number of mine casualties and the demining area

were 286 victims, most of whom were civilians. Mine and UXO contamination is concentrated in rural areas where 80% of the Cambodian population live. Therefore, it is recognized as an urgent issue for the socio-economic development of Cambodia to remove the mines and UXO and ensure the safety of residents' lives.

Whereas the number of anti-personnel mine victims has significantly decreased, the ratio of victims of UXO and Explosive Remnants of War (ERW) left behind in former battlefields is increasing. Moreover, recent progress in rural development has resulted in the introduction of large machinery, etc., hitherto unknown, for working in the paddy fields and fruit farms and has consequently caused an increase in the number of victims of landmines and other explosives previously hidden relatively deep in the ground. The number of casualties slightly increased in 2010 compared with in 2009.

Furthermore, the north-western part of the country, allegedly a region highly contaminated with anti-personnel mines, is said to have appropriate soil for rice culture and other cultivation, and demining activities in this and more remote areas will be required in view of the progress of agriculture-centered economic development policies in Cambodia.

The total area that has been cleared in Cambodia is about 535km^2 (1992 to 2009), of which the Cambodian Mine Action (CMAC), has cleared an approximate area of 263 km^2. The area that needs to be cleared by the end of 2019 is 648.8 km^2, about 1.2 times the area cleared in the 18 years up to 2009. Unless there is improvement in the efficiency of landmine technical surveying and demining activities, it is feared that the extended time limit of the "Anti-Personnel Mine Ban Treaty" will not be met. Moreover, the need to release more land for productive use through landmine technical surveys is increasing, making it necessary to carry out more accurate surveys and information processing functions.

To deal with these circumstances, CMAC is working on function enhancement from two perspectives: advancement of technology and improvement in methods related to demining. Machines such as brush cutters procured by Japanese grant aid assistance in the past have contributed to a significant increase in the annual demining area (which used to be around 10 km^2 per year up to 2003 but roughly doubled to 22.1 km^2 per year in 2005). However, many of the machines owned by CMAC have been used beyond the limits of their service life such as standard cumulative operating time and mileage, resulting in a manifest increase in maintenance costs and a drop in work efficiency and quality. For example, there are total 3,536 mine and metal detectors and 1,921 are unrepairable, 582 are being repaired, and 983 are in use. About half of

the vehicles required for transportation of deminers have been used for more than 10 years and 20 vehicles that have been used for less than 10 years but have a mileage of over 250,000 km. Both of these groups have reached the end of their useful life and are highly deteriorated.

3. Summary of the Results of the Survey and Components of the Project

The Japan International Cooperation Agency (JICA) decided to conduct a preparatory survey on The Project for Improvement of Equipment for Demining Activities (Phase VI) in the Kingdom of Cambodia and organized a survey team. The survey team had meeting with the relevant personnel of the Royal Government of Cambodia on the contents of the request, surveyed the candidate project sites and collected relevant data in Cambodia from October 20th, 2010 to November 5th, 2010. After returning to Japan, the team examined the relevance of this project on the basis of the results of the field survey, formulated an implementation plan for this project and drafted a preparatory survey report. JICA dispatched another survey team to Cambodia from January 13th to 19th, 2011, and obtained the consent of the Royal Government of Cambodia on the general contents of the draft report.

The scope of the project is procurement of equipment required for achieving the goals of the demining plan formulated by the Royal Government of Cambodia. Table 1 shows the demining plan of CMAC. The team selected types of equipment to be procured from the equipment required for implementing the demining plan formulated by the Royal Government of Cambodia and decided specifications and quantities of the selected equipment to examine relevance of the request and to formulate an equipment plan, with the capacity of CMAC in equipment operation and maintenance and project implementation and the conditions of the equipment owned by CMAC taken into consideration. Table 2 shows the summary of the formulated equipment plan.

Table-1: Five-year Demining Plan of CMAC (from the Five-year Plan of CMAC (2010 – 2014))

Year	Staff	Productivity (m^2)	Land Release through Survey (m^2)	UXO/Mines	Cost (USD)
Year 1: 2010	2,174	33,810,000	178,200,000	155,760	12,586,220
Year 2: 2011	2,172	37,974,000	178,200,000	167,400	12,983,816
Year 3: 2012	2,143	38,274,000	132,000,000	167,520	12,772,952
Year 4: 2013	2,143	38,274,000	132,000,000	167,520	12,772,952
Year 5: 2014	2,118	38,274,000	99,000,000	167,520	12,599,252
TOTAL:		186,606,000	719,400,000	825,720	63,715,192

Source: CMAC

Table-2 Summary of the Major Equipment Plan (Equipment that costs more than one million yen)

No.	Equipment name	Main specifications	Quantity	Intended use, etc.
1	Brush cutter	Type: Rotary cutter Quality: CMAC standard	8	Removal of shrubs before demining
2	Pickup truck	Type: Four-wheeled drive	50	Transportation of staff and equipment
3	Station wagon	Type: Four-wheeled drive	58	Transportation of staff , dogs and equipment
4	Deep search detector	Type: Ladder type Quality: CMAC standard	87	Detection of objects and UXO buried at significant depth. Operated by a team of two to search a large area.
5	Tent (size: 6.0m x 10.0m)	Type: 6.0m x 10.0m	32	Portable tent for accommodation of deminers
6	Microbus	Type: 12 to 15 seater	7	Transportation of deminers during training

4. Project Period and Estimated Project Costs

When implementing this project under the Japanese Grant Aid scheme, costs to be borne by the Cambodian sides are expected to be 0.3 million yen. It is expected to require 6.0 months and 11.0 months to draw execution designs and to procure and install equipment, respectively, in this project.

5. Evaluation of the Project

The following quantitative and qualitative effects are expected from the implementation of this project.

(1) Quantitative effect

1) The cumulative area of the land demined by CMAC will reach 452.1 km^2 by the end of 2014.

(2) Qualitative effects

1) The implementation of the project will improve efficiency of manual demining activities by making it easy to maintain performance of the equipment and improving the workplace safety of deminers with replacement of old and dilapidated equipment with new one.
2) After demining and a technical survey, more land will be released for productive use.
3) Reduction in the area of land contaminated with landmines will contribute to the guarantee of the safety of people’s life.

The team considers implementation of the requested assistance under the Japanese Grant Aid scheme relevant on the basis of the contents of the project, extent of its effects and implementing capacity in operation and maintenance of equipment of the counterpart implementing agency.

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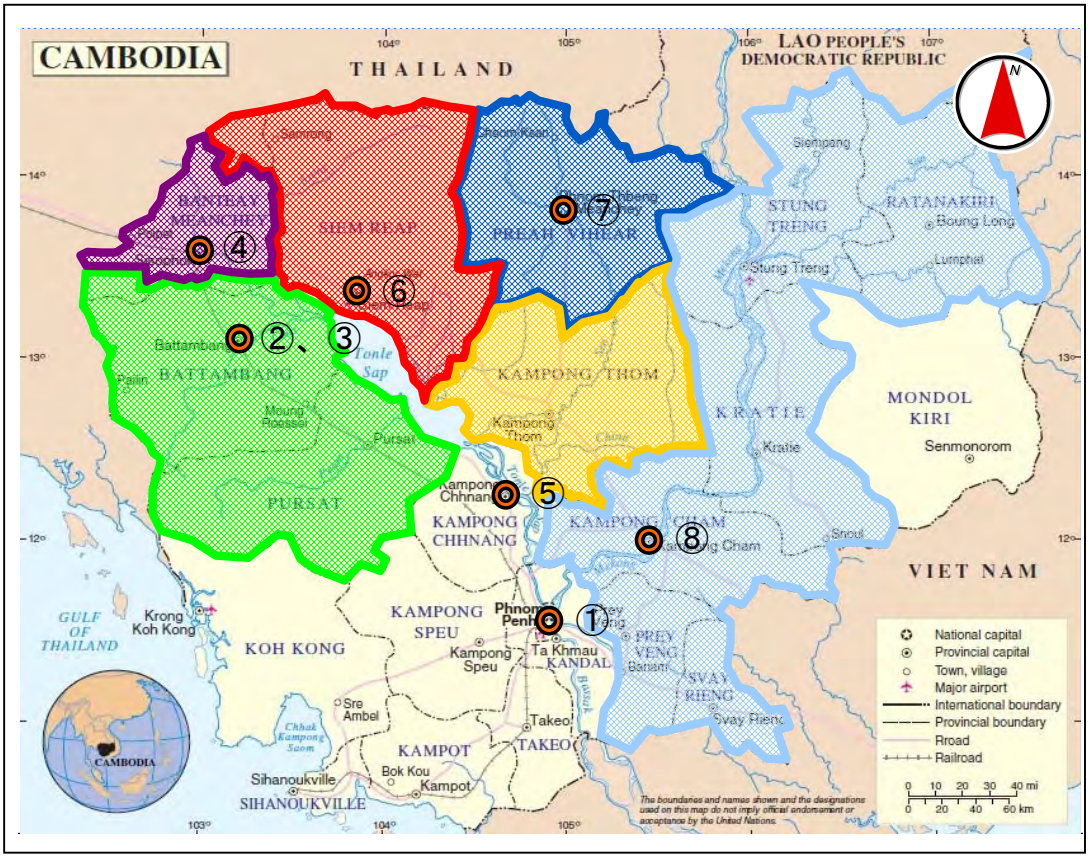

LEGEND — *Area of activities of each Demining Unit of CMAC*

- Area of activities of Demining Unit 1 (DU1) Banteay Meanchey Province
- Area of activities of Demining Unit 2 (DU2) Battambang and Pursat Provinces
- Area of activities of Demining Unit 3 (DU3) Preah Vihear Province
- Area of activities of Demining Unit 4 (DU4) Kampong Thom Province
- Area of activities of Demining Unit 5 (DU5) Kampong Cham and Kratie Provinces
- Area of activities of Demining Unit 6 (DU6) Siem Reap and Oddar Meanchey Provinces

① Phnom Penh (CMAC Head Quarter)

② Battambang (DU2)

③ Battambang (CMAC Central Workshop)

④ Banteay Meanchey (DU1)

⑤ Kampong Chhnang (Training Center)

⑥ Siem Reap (DU4, DU6)

⑦ Preah Vihear (DU3)

⑧ Kampong Cham (DU5)

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Abbreviations

Abbreviation	Name
B/A	Banking Arrangement
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
G/A	Grant Agreement
GDP	Gross Domestic Product
GNI	Gross National Income
GPS	Global Positioning System
Halo Trust	Hazardous Area Life-Support Organization
HQ	Headquarters
JMAS	Japan Mine Action Service
JICA	Japan International Cooperation Agency
LLD	Long Leash Dog
MAG	Mine Advisory Group
MAPU	Mine Action Planning Unit
M/D	Minutes of Discussion
MPL	Mobile Platoon
MRE	Mine Risk Education
NGO	Non-Governmental Organization
PICMA	Programa Presidential para la Accion Integral contra Minas Antipersonal
PMAC	Provincial Mine Action Committee
SLD	Short Leash Dog
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

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1-1 Current State and Problems of the Sector Concerned

1-1-1 Current State and Problems

Although more than 20 years have passed since the end of the conflict, the Kingdom of Cambodia (hereinafter referred to as “Cambodia”) is still suffering from the severe contamination of landmines and UXOs. A survey conducted between 2000 and 2002 concluded that a total area of 4,544 km^2 in 6,422 villages, or 46 % of the entire rural villages, were confirmed or suspected of the contamination. Although the number of landmine/UXO victims per year had been decreasing since 1996 when the largest number of the victims, 4,320, was recorded, there were 244 victims in 2009, most of whom were civilians. Since most of the contamination of landmines and UXOs is found in rural areas where 80 % of the Cambodians live, clearance of landmines and UXOs for the guarantee of safe life to the people has been recognized as an urgent task for the socio-economic development of the country. The Royal Government of Cambodia ratified “The Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction” in 1999. Since then, the government has been making efforts to fulfill the obligation of the convention of destruction of all anti-personnel landmines in mined areas within 10 years of ratification through landmine surveys and clearance activities. However, only a total of 480 km^2 of land had been cleared of landmines during the period between 1992 and 2008. The Cambodian Mine Action Centre (CMAC) had cleared landmines in the area of 227 km^2 among the 480 km^2 of the demined area.) Since many pieces of the demining equipment owned by CMAC, including brush cutters, have been used under harsh conditions and beyond the limit of their standard cumulative operating hours, there is concern over the decline in their functions and operation rates. The Royal Government of Cambodia had applied for a ten-year extension of the deadline for the destruction of landmines and the deadline was extended till the end of 2019. However, it is doubtful whether the Royal Government of Cambodia will be able to meet the extended deadline without improving the efficiency of landmine surveys and clearance activities.

1-1-2 Development Plan

The Roual Government of Cambodia considers the clearance of landmines and unexploded ordnance (UXO) as a priority item in "Agricultural Sector Development," one of the four pillars of the Cambodian National Development Plan announced in 2008, and recognizes it as an urgent task to be accomplished from the viewpoint of socio-economic development and human security. Furthermore, the "Cambodia Millennium Development Goals" established in 2005 set goals for the number of mine victims (down from 797 persons per

year in 2005 to 125 persons per year in 2015) and the ratio of cleared area (up from 30% in 2005 to 87% in 2015).

The Royal Government of Cambodian ratified the "Anti-Personnel Mine Ban Treaty" in 1999 and carried out landmine contamination surveys (landmine technical surveys) and demining in pursuit of the clearance of buried mines within 10 years, as required by the Treaty. However, since it was deemed difficult to remove the mines within this time limit, the government applied for an extension of 10 years as stipulated in the Treaty, and the time limit for implementation was extended to the end of 2019. In addition, the Cambodian Mine Action and Victim Assistance Authority (CMAA), a regulatory organization for demining, took the initiative of putting together a "National Strategy For Mine Action 2010-2019," which was officially adopted in November 2010. While demining is considered to be completed when a hand-over certificate is issued, this Strategy states that from 2010 demining work is required to conduct full clearance of an area of 648.8 km^2, and release an estimated area of 1,097.8 km^2 through the landmine technical surveys. This will require an estimated budget of 455 million dollars.

1-1-3 Socio-economic Conditions

Cambodia had achieved food self-sufficiency and was exporting rice and gum in the 1960's. However, the economy of the country declined in the 1970's because of the civil war and the reign of terror of the Pol Pot Regime. A full-scale national reconstruction began after the conclusion of the Paris Peace Accord in 1991 and the GDP grew at an average rate of 6.1 % in the three-year period between 1994 and 1996. However, the economy of the country deteriorated again in 1997 because of the military conflict and the Asian Economic Crisis. The political stability realized by the establishment of the new Hun Sen Administration in 1998 realized positive economic growth. Cambodia had maintained the economic growth rate of over 10% per year for several years since 2004. Although the economy was affected by the economic crisis of 2008, it is on the way to the recovery. Despite having GDP (US$ 10.8 billion in 2009, data of IMF) and *per capita* GNI (US$ 610 in 2009, The World Bank) smaller than the neighboring countries, Cambodia has maintained steady economy growth as exemplified by the relatively-low unemployment rate at 1.8 % (between 1996 and 2005, UNDP).

The major industries in Cambodia are agriculture, fisheries and forestry. Among them, agrculture, in particular, produces approximately 30 % of GDP and employs 70 % of the work force (between 1996 and 2005, UNDP). The tourism and service industries, agriculture and the mining and manufacturing industries produce 38.5 %, 31.7 % and 23.8 %, respectively, of the GDP of the country (2008, data of the Royal Government of Cambodia).

Agricutural land and forests occupy most of the land of Cambodia. Expansion of farming land is expected from the government's plan to increase rice production nationwide. Thus, potential risk from uncleared landmines is still a significant problem to the country.

1-2 Background and Outline of the Grant Aid Assistance

Many of the urgently-needed demining activities depend on use of demining equipment. Approximately half of the major demining equipment currently in use has been procured with the Japanese Grant Aid Assistance. This assistance with the equipment has contributed to significant improvement of the efficiency of the demining activities. For example, the area of the land cleared of landmines per year has increased more than twice since the assistance began. Meanwhile, although CMAC has been trying to maintain the equipment at its workshops, the use under harsh conditions has inflicted severe damage to all the equipment and they are in a state of advanced dilapidation. Therefore, it is considered certain that the efficiency of the demining activities declines unless appropriate measures are taken. Timely replacement of the old and worn-out equipment is required for the maintenance of the precision and efficiency of the demining activities. However, because CMAC has little budget at its own discretion as before and most of the assistance from UN agencies and bilateral donors is for the operating costs of the demining activities, it is difficult for CMAC to replace the required equipment.

Against this background, the Royal Government of Cambodia submitted a request for grant aid assistance for the procurement of demining equipment, including metal/mine detectors, required for the demining plan to the Government of Japan.

The requested equipment verified during the preparatory survey consisted of brush cutters, pickup trucks, station wagons, mine detectors, mine/UXO detectors, deep search detectors, tents (large and small), portable GPS receivers, handheld VHF transceivers, diesel generators, spare parts (for brush cutters, vehicles, mine/UXO detectors and deep search detectors) and microbuses.

1-3 Past and Present Japanese Assistance

Tables 1-1 and 1-2 show the Japanese assistance to Cambodia in the demining activities in the past.

Table 1-1 Japanese technical assistance and loan assistance in the past (in the demining sector)

Type of assistance	Implementation period	Project title, etc.	Outline
Technical Assistance Project	Fiscal 2008 - 2010	Project for Strengthening of CMAC Function for Human Security Realization	Improvement in organizational function of CMAC was intended through strengthening of i) the information management capacity, ii) functions of the Central Workshop and iii) the capacity to provide training.
Dispatch of Experts	Fiscal 1999	Specialty: Information system Technical Advisor Number of expert: one (1)	An expert was dispatched for strengthening the operation capacity of the department responsible for information management of CMAC
	Fiscal 2000 - 2005	Specialty: Information system Technical Advisor Number of expert: one (1)	ditto
	Fiscal 2000 - 2002	Specialty: Maintenance & Transport Technical Advisor Number of expert: one (1)	An expert was dispatched for efficient use of the vehicles for the demining activities of CMAC and improving the capacity to maintain the vehicles.
	Fiscal 2002 - 2006	Specialty: Maintenance & Transport Technical Advisor Number of expert: one (1)	ditto
	Fiscal 2006 - 2008	Specialty: Corporate Management Chief Advisor Number of expert: one (1)	An expert was dispatched for improving organizational functions of CMAC.
Follow-up Assistance	Fiscal 2004	Follow-up Study Team for the Project for Improvement of Equipment for Demining Activities	Spare parts for repair of the equipment provided in the grant aid assistance were provided.
	Fiscal 2006	Follow-up Study Team for the Project for Improvement of Equipment for Demining Activities	ditto

Table 1-2 Japanese Grant Aid Assistance in the past (in the demining sector)

(in hundred million yen)

Implementation period	Project title	Grant limit	Outline
1998	The Project for Improvement of Equipment for Demining Activities (Phase I)	4.7	Procurement of equipment for the demining activities
2000	The Project for Improvement of Equipment for Demining Activities (Phase II)	3.3	Procurement of equipment for the demining activities
2002	The Project for Improvement of Equipment for Demining Activities (Phase III)	7.98	Procurement of equipment for the demining activities
2004	The Project for Improvement of Equipment for Demining Activities (Phase IV)	17.61	Procurement of equipment for the demining activities
2005	The Project for Research and Development of Mine Clearance Related Equipment (Phase I)	4.16	Research and development of equipment supporting demining activities
2007	The Project for Research and Development of Mine Clearance Related Equipment (Phase II)	4.84	Research and development of equipment supporting demining activities
2008	The Project for Improvement of Equipment for Demining Activities (Phase V)	5.48	Procurement of equipment for the demining activities
2009	The Programme for Integrated Mine Clearance and Landmine Victim Assistance (Grant Aid for Conflict Prevention and Peace Building)	10.98	Procurement of equipment for clearance of anti-personnel landmines and assistance to the people in development of farming land and training in agriculture

1-4 Past and Present Assistance from Other Donors

Several countries including U.S.A., Germany, Australia and Canada provide assistance to Cambodia either through UN agencies or in the form of bilateral assistance. Most of their financial assistance is used for the operating costs of the demining activities and is not used for procurement of equipment. Table 1-3 shows the assistance provided to CMAC including the revenue from the budget of the Royal Government of Cambodia and Japanese bilateral assistance.

Table 1-3 Assistance from international organizations and other donors

(Unit: US$)

		2005	2006	2007	2008	2009
UN-related	UN Development Programme	3,083,760	3,450,000	4,120,000	4,000,000	4,006,912
	UNICEF	78,186	63,013	78,395	211,000	57,798
	Subtotal	**3,161,946**	**3,513,013**	**4,198,395**	**4,211,000**	**4,064,710**
Bilateral assistance	Japan	2,578,745	1,743,060	3,176,977	2,062,272	1,268,282
	US	1,631,602	1883,820	1,527,174	1,600,000	2,023,248
	Germany	835,000	1,058,451	1,055,172	1,189,312	1,375,523
	Japan-Asia Fund	-	-	376,910	1,998,974	-
	Subtotal	**5,045,347**	**4,685,331**	**6,136,233**	**6,850,558**	**4,667,053**
Nongovernmental organizations	Norwegian People's Aid	916,309	699,771	720,422	478,782	135,009
	Cooperative for American Remittances to Europe	36,902	104,080	-	-	-
	Handicap International	203,089	-	-	-	-
	Save the Children	-	224,786	-	-	1,001,138
	Japan Mine Action Service	125,351	129,437	319,598	470,509	796,420
	Subtotal	**1,281,651**	**1,158,074**	**1,040,020**	**949,291**	**1,932,567**
Cambodia's own budget (reference)		**75,518**	**244,668**	**214,367**	**220,000**	**220,000**
Total		**9,564,462**	**9,601,086**	**11,589,015**	**12,230,849**	**10,884,330**

Source: CMAC

1-5 Conditions in and around the Project Sites

1-5-1 Natural conditions

In Cambodia, the Mekong River flows from north to south in the east of the Central Plain and the Lake Tonle Sap is located in the west of the Central Plain. Cambodia is located in the tropical monsoon climate zone and has a rainy season and a dry season in a year. In the latter, a hot season (from early February to mid-May) and a cool season (from early November to late January) can be recognized.

The focus of demining by CMAC is moving toward the rural areas with inferior infrastructure conditions. The demining activities are more susceptible to the climate (such as the temperature, humidity, and precipitation) described above. Both equipment and deminers are exposed to harsh natural conditions such as high temperature and precipitation.

Soil in rural areas is reddish soil with high content of iron and aluminum specific to the tropical areas which affects performance/functions and may cause malfunction of mine detectors, a type of metal detector.

1-5-2 Environmental and social considerations

In Cambodia, the development of laws and regulations regarding environmental and social considerations has not been completed. However, land to be demined is being determined in a bottom-up fashion as described below, with the Mine Action Planning Unit (MAPU) serving as the secretariat to provide a draft plan adjusted to the needs of villagers.

(1) In a commune meeting, villagers discuss priority minefields to be cleared and land use of them after clearing.

(2) In a district workshop attended by relevant directors of the province, NGOs, MAPU, and CMAC, priority minefields are identified in consideration of needs of villagers and intentions of donors.

(3) The Provincial Mine Action Committee (MAPU) and CMAC visit the target minefields.

(4) PMAC of the province establishes a final mine disposal plan in harmony with the national-level plan.

(Precedence is given to land with more urgency in relation to farmland and resettlement of farmers, community roads, access to water, etc.)

As stated above (1) to (4), the needs of beneficiaries (vulnerable people including farmers) at the village community level. Subsequently, the meeting is held at the district level and, then, at the provincial level, at which priority areas are identified. Final decision on selection of demining sites is made at the PMAC. Since views of the people are taken into

consideration sufficiently in this process, sufficient environmental and social considerations are taken in the implementation of demining activities.

Intended use of land after demining is clearly defined at the application stage. The government is implementing policies to promote permanent settlement (nearly 60% is settled permanently in 2007) such as ban on sales of demined land by owners for five years of acquisition.

In terms of environmental problems, since the priority for demining is given to former farming land which cannot be used because of the existence of landmines, the demining activities are unlikely to create new environmental problems. Removal of grass and trees for demining is minimized. Exhaust gases created by disposal of landmines by detonation have only temporary effects. An attempt is being made to change the method of disposal of UXOs which have high explosive content from disposal by detonation to reuse of explosive removed from UXOs as charge explosive for detonating unearthed landmines.

(Reference used and cited: Mine Clearing in Cambodia, Front Line of Resident-Participatory Peace Building by Nao Shimoyachi, a research fellow)

Table 1-4 shows the results of the assessment of the impact of the demining activities on the environment.

Table 1-4 Results of the Environment Impact Assessment of the demining activities

Assistance project title		Project for Improvement of Equipment for Demining Activities (Phase VI) in the Kingdom of Cambodia	
No.	Environmental item	Rating	Reason
Social environment: Impact on gender issues and children's rights concerns all the items under the social environment.			
1	Involuntary resettlement	D	There will be no involuntary resettlement.
2	Local economy including employment and livelihood of the people	D	N/A
3	Use of land and local resources	D	N/A
4	Social systems such as social infrastructure and local decision-making bodies	D	N/A
5	Existing social infrastructure and services	D	Clearance of landmines from mined areas will make access to public facilities easier.
6	The poor, aboriginal people and ethnic minorities	D	Positive impact is expected for the poor who collect firewood in forests and sell it for livelihood.
7	Maldistribution of benefits and damage	D	There is no factor to create maldistribution.
8	Cultural heritages	D	There is no factor to create maldistribution.
9	Conflict of interests within communities	D	There is no factor to create maldistribution.
10	Water use, water use rights and communal rights	D	There is no factor to create maldistribution.
11	Public hygiene	D	There is no factor to create maldistribution.
12	Disasters (risks) and infectious diseases such as HIV/AIDS	D	There is no factor to create maldistribution.
Natural environment			
13	Topography and geology	D	There is no factor to create maldistribution.
14	Soil erosion	D	There is no factor to create maldistribution.
15	Groundwater	D	There is no factor to create maldistribution.
16	Hydrological conditions	D	There is no factor to create maldistribution.
17	Coastal areas (mangroves, coral reeves, tidal flats, etc.)	D	There is no factor to create maldistribution.
18	Fauna, flora and bio-diversity	D	There is no factor to create maldistribution.
19	Climate	D	There is no factor to create maldistribution.
20	Scenery	D	There is no factor to create maldistribution.
21	Global warming	D	There is no factor to create maldistribution.
Pollution			
22	Air pollution	D	Disposal by detonation will create temporary air pollution.
23	Water pollution	D	There is no factor to create maldistribution.
24	Soil pollution	D	There is no factor to create maldistribution.
25	Wastes	D	There is no factor to create maldistribution.
26	Noise and vibration	D	Disposal by detonation will generate temporary noise and vibration.
27	Ground subsidence	D	There is no factor to create maldistribution.
28	Bad odor	D	There is no factor to create maldistribution.
29	Sediment	D	There is no factor to create maldistribution.
30	Accident	D	There is no factor to create maldistribution.

Rating criteria

A: Serious impact expected
B: Some impact expected
C: Unknown (need for investigation)
D: Little impact expected

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goals and Project Purpose

Regarding the clearance of landmines and unexploded ordnance (UXO), the Royal Government of Cambodian set goals for the number of mine victims (down from 797 persons per year in 2005 to 125 persons per year in 2015) and the ratio of cleared area (up from 30% in 2005 to 87% in 2015) in the "Cambodia Millennium Development Goals" established in 2005.

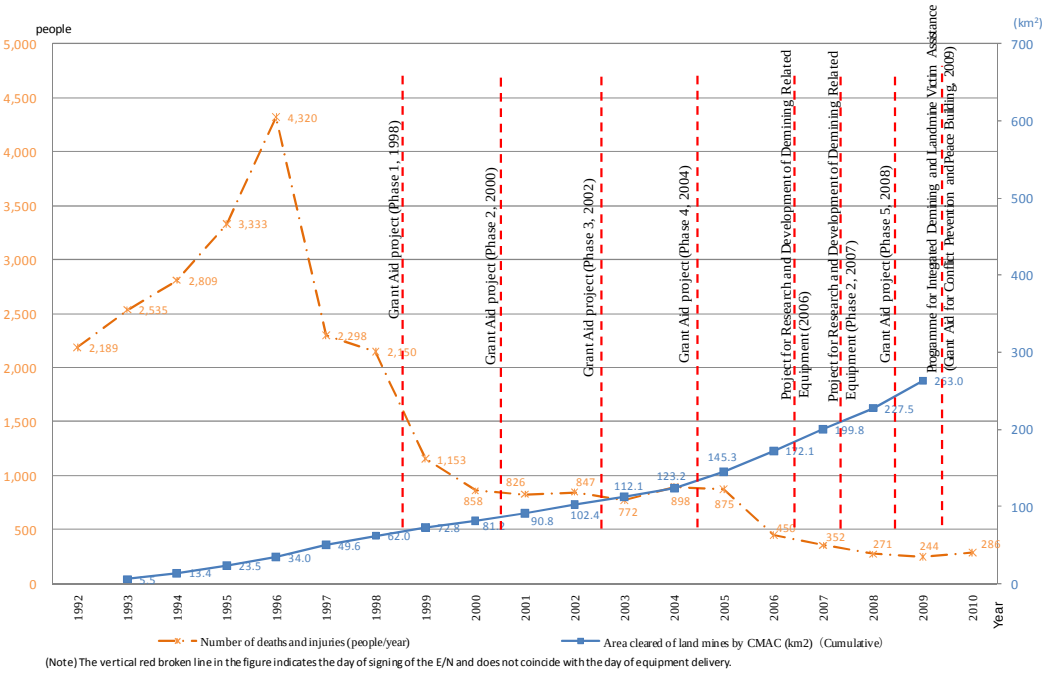
The extension of the "Anti-Personnel Mine Ban Treaty" ratified in 1999 for 10 years was applied for and the time limit for implementation was extended to the end of 2019. based on these goals, "National Strategy For Mine Action 2010-2019," which was officially adopted in November 2010, states that demining work is required to conduct full clearance of an area of 648.8 km^2, and release an estimated area of 1,097.8 km^2 through the landmine technical surveys. As shown in Table 2-1, CMAC's five-year plan (2010 to 2014) is targeted at demining of about 186km^2 and technical survey of about 719km^2 by 2014.

Table 2-1 CMAC's five-year demining plan (2010 to 2014)

Year	Annual demining area (m^2)	Annual area of land permitted for use after technical survey (m^2)
2010	33,810,000	178,200,000
2011	37,974,000	178,200,000
2012	38,274,000	132,000,000
2013	38,274,000	132,000,000
2014	38,274,000	99,000,000
Total	186,606,000	719,400,000

2-1-2 Present Conditions and Problems in This Sector

The annual number of mine and UXO victims in Cambodia peaked at 4,320 in 1996 and has been on the decline ever since as shown in Figure 2-1. In 2010, however, there were 286 victims, most of whom were civilians. Mine and UXO contamination is concentrated in rural areas where 80% of the Cambodian population live. Therefore, it is recognized as an urgent issue for the socio-economic development of Cambodia to remove the mines and UXOs and ensure the safety of residents' lives.



(Note) The vertical red broken line in the figure indicates the day of signing of the E/N and does not coincide with the day of equipment delivery.

Figure 2-1 Changes in the number of mine casualties and the demining area

Whereas the number of anti-personnel mine victims has significantly decreased, the ratio of victims of UXO and Explosive Remnants of War (ERW) left behind in former battlefields is increasing. Moreover, recent progress in rural development has resulted in the introduction of large machinery, etc., hitherto unknown, for working in the paddy fields and fruit farms and has consequently caused an increase in the number of victims of landmines and other explosives previously hidden relatively deep in the ground. The number of casualties slightly increased in 2010 compared with in 2009.

Furthermore, the north-western part of the country, allegedly a region highly contaminated with anti-personnel mines, is said to have appropriate soil for rice culture and other cultivation, and demining activities in this and more remote areas will be required in view of the progress of agriculture-centered economic development policies in Cambodia.

The total area that has been cleared in Cambodia is about 535km^2 (1992 to 2009), of which the CMAC has cleared an approximate area of 263 km^2. The area that needs to be cleared by the end of 2019 is 648.8 km^2, about 1.2 times the area cleared in the 18 years up to 2009. Unless there is improvement in the efficiency of landmine technical surveying and demining activities, it is feared that the extended time limit of the "Anti-Personnel Mine Ban Treaty" will not be met. Moreover, the need to release more land for productive use through landmine technical surveys is

increasing, making it necessary to carry out more accurate surveys and information processing functions.

To deal with these circumstances, CMAC is working on function enhancement from two perspectives: advancement of technology and improvement in methods related to demining. Machines such as brush cutters procured by Japanese Grant Aid assistance in the past have contributed to a significant increase in the annual demining area (which used to be around 10 km^2 per year up to 2003 but roughly doubled to 22.1 km^2 per year in 2005). However, many of the machines owned by CMAC have been used beyond the limits of their service life such as standard cumulative operating time and mileage, resulting in a manifest increase in maintenance costs and a drop in work efficiency and quality. Specifically, out of 23 brush cutters currently in operation, eight machines procured as part of the Phase 3 of the Japanese Grant Aid project in 2002 have exceeded their average machine life of 10,000 hours and will sooner or later show a drop in operability or require high repair costs to maintain them in working order. (The four brush cutters procured as part of the Phase 1 of the Japanese Grant Aid are already past their useful life and are no longer used for demining operations.) Of the 3,536 mine and metal detectors, 1,921 are unrepairable, 582 are being repaired, and 983 are in use. The 260 vehicles required for transportation of deminers include 114 that have been used for more than 10 years and 20 that have been used for less than 10 years but have a mileage of over 250,000 km. Both of these groups have reached the end of their useful life and are deteriorated.

2-1-3 Project Purpose

This project is aimed at renewing and enhancing the equipment required for the demining activities of CMAC, an organization that plays a central role in demining in Cambodia, in order to ensure efficient and safe demining activities by CMAC and thus contribute to the achievement of the overall goals.

An outline of the equipment is shown in Table 2-2 and Figure 2-2.

Table 2-2 List of equipment

No.	Equipment name	Main specifications	Quantity	Intended use, etc.
1	Brush cutter	Type: Rotary cutter Quality: CMAC standard	8 units	Removal of shrubs before demining
2	Pickup truck	Type: Four-wheeled drive	50 units	Transportation of staff and equipment
3	Station wagon	Type: Four-wheeled drive	58 units	Transportation of staff and equipment
4	Mine detector	Type: Portable Quality: CMAC standard	221 units	Detection of metal and mines
5	Mine/UXO detector	Type: Portable Quality: CMAC standard	184 units	Detection of objects and UXO buried at significant depth
6	Deep search detector	Type: Ladder type Quality: CMAC standard	87 units	Detection of objects and UXO buried at significant depth. Operated by a team of two to search a large area.
7	Tent (size: 6.0m x 10.0m)	Type: 6.0m x 10.0m	32 units	Portable tent for accommodation of deminers
8	Tent (size: 3.5m x 7.0m)	Type: 3.5m x 7.0m	54 units	Portable tent for accommodation of deminers
9	Portable GPS receiver	Type: Portable	117 units	Identification of borders of minefields
10	VHF handheld transceiver	Type: VHF handheld	205 units	Communications between deminers in the field
11	Generator (3kVA)	Type: 3kVA	27 units	Charging of detector batteries
12	Spare parts for Brush cutters	Spare parts required for maintenance of existing brush cutters (assuming maintenance for three years)	1 set	Maintenance of currently owned equipment
13	Spare parts for vehicles	Spare parts required for maintenance of existing vehicles	1 set	Maintenance of currently owned equipment
14	Spare parts for mine detectors	Spare parts required for existing mine/metal detectors and deep search detectors	1 set	Maintenance of currently owned equipment
15	Microbus	Type: 12 to 15 seater	7 units	Transportation of deminers during training

1. Brush cutter

2. Pickup truck

3. Station wagon

4. Mine detector

5. Mine/UXO detector

6. Deep search detector

7 and 8. Tent

9. Portable GPS receiver

10. VHF handhold transceiver

11. Generator

12, 13, 14. Spare parts

15. Microbus

Figure 2-2 Equipment photos

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

For the purpose of ensuring the safety of the lives of the Cambodian people and facilitating social and economic development by achieving the target for mine and UXO clearance in Cambodia, in order to maintain the level of skills and efficiency of the activities of CMAC by replacing or reinforcing the old and dilapidated equipment in its possession, and on the basis of the request from the Royal Government of Cambodia and the results of the survey and consultations, it was decided that this Grant Aid project would be planned in accordance with the following policies.

2-2-1-1 Basic Policies

The following four policies were adopted as the basic policies:

(1) In order to meet the demining deadline under the Convention on the Prohibition of Anti-Personnel Mines (Ottawa Treaty) at the end of 2019 by maintaining the capacity and efficiency of demining activities as of 2009, CMAC's equipment which is approaching the end of its life (or has already reached it) will be replaced.

(2) With regard to the above-mentioned (1), only equipment that directly contributes to the demining activities and maintenance of the demining capacity will be considered for procurement in this project and equipment which does not satisfy either of these conditions will be excluded from this project.

1) As the progress of rural development is expected to increase demining activities in remote areas, with deminers staying in those areas for longer than before, equipment that contributes to the improved efficiency of the work of the deminers in remote areas will be replaced preferentially.
2) Because of the need to improve the cost-efficiency of its activities with a limited operating budget, CMAC endeavors to improve work efficiency through improvements in both technology and methodology while maintaining work safety, and such improvements in technology and methodology require more emphasis on training for the deminers. Therefore, equipment relevant to training will be considered for the project.
3) Information system equipment will be excluded from this project because it makes little direct contribution to the demining activities. Relatively inexpensive equipment which can be procured locally, such as protective

clothing and manual brush cutters, will be excluded from this project because CMAC could procure such equipment with financial assistance from the Royal Government of Cambodia or other donors.

(3) Since it is financially difficult for CMAC to procure expensive spare parts for special equipment with its own budget, such equipment will be procured with the spare parts, the quantities of which will be decided on the basis of the usage records, in order to maintain the effectiveness of the activities.

(4) As the safety of the deminers and the efficiency of their activities are the priority concerns, consistency between the equipment to be procured and the existing equipment will be maintained by designating certain equipment (brush cutters (Brush cutters), mine detectors, etc.) which have passed the performance and safety tests conducted independently by CMAC for the procurement.

2-2-1-2 Policy on Environmental Conditions

Vegetation, soil, climate and stagnant water are the natural conditions which have the greatest effect on the performance of the main equipment to be procured, i.e. Brush cutters, vehicles and mine/metal detectors. Therefore, the specifications of such procured equipment will be the minimum required for the equipment to perform at full capacity in the existing vegetation, soil, climate and stagnant water conditions.

(1) Vegetation

Cambodia is located in the Mekong River Basin in the south of the Indochina Peninsula. Its climate, geology and vegetation are greatly affected by the Mekong River. Dense forests which once covered the entire country have been almost entirely wiped out because of the long civil war, slash-and-burn farming and timber exports (including illegal felling and exports). With the exception of the mountains in the north and south, only medium-size brush composed of shrubs up to 15 cm in diameter are found scattered around in the country.

Sporadic fighting between the forces of the Royal Government of Cambodian and Khmer Rouge forces continued until 1999. When peace returned to Cambodia after 2000, internally-displaced people (farmers forced out of rural areas by the military conflict, ex-farmers living in urban areas who wished to go back to rural areas after failing to make a living in urban areas, the poor in urban areas, etc.) rushed to settle in areas where there was danger of land mines and began slash-and-burn farming. (Despite the demining and risk

avoidance education activities conducted at the time, little decrease in the number of mine victims was observed.) A particularly large number of people settled and began to practice slash-and-burn farming in the former combat zone along the border with Thailand in the west and north of the country, e.g. Pailin, Battambang, Banteay Meanchey, Prey Vihear, Siem Reap, Oddor Meanchey and Kampong Thom Provinces. Land mines had been planted in the west and north of Cambodia (along the border with Thailand) for three reasons; to protect military bases, to protect the fronts and to obstruct people's lives. In other regions of the country, the central, eastern and southern regions, felling of forests for settlement has continued since 1993 and forests have been turned into paddy fields.

(2) Soil, Climate and Stagnant Water

Reddish lateritic soil specific to the tropical zone is widely found in Cambodia. Magnetized laterite is found specifically in the east. The climate is hot and humid in the rainy season between May and October. The average annual precipitation is 1,400 mm and 4,000 mm in the capital, Phnom Penh, and in the mountains, respectively. Heavy rain in the rainy season and poor drainage facilities inevitably lead to water stagnation. Ruts that form in the roads during the rainy season become hard in the dry season and the hardened ruts make vehicle traffic very difficult and put a great strain on vehicles.

(3) Policy on Environmental Conditions

In order to make it possible to procure the equipment which provides the maximum output in the demining activities under the above-mentioned natural conditions, the following policies were adopted.

1) Brush cutters:

Since Brush cutters are required for a unique purpose, those meet CMAC's regulations will be procured not only for their suitability to the brush and the natural conditions on the ground such as topography but also for operating safety.

2) Vehicles:

Because the vehicles to be procured will be used on roads in extremely poor condition (including stagnant water), four-wheel-drive pickup trucks and station wagons with excellent maneuverability will be procured.

3) Detectors:

Performance of the mine detectors is greatly affected by the soil conditions at the sites. Magnetized soil found in the east of the country, in particular, is said to hamper the performance as the metal detectors so much that it is difficult to ensure stable mine detection accuracy. Manufacturers of detectors have made various inventions to make their products widely applicable to various soil conditions. However, the efficiency of detecting land mines planted in this magnetized laterite differs significantly between detectors of different manufacturers (according to the results of tests performed by CMAC). Therefore, detectors approved by CMAC with a proven record will be procured for their suitability to the special geological conditions at the sites and their reliability in mine detection.

4) Portable GPS receivers, VHF handheld transceivers

In order to protect equipment from water damage caused by unexpected rain or by being accidentally dropped in puddles, waterproof equipment will be procured.

2-2-1-3 Policy on Special Conditions at the Project Site

As mentioned in "3-2-1-2 Policy on Environmental Conditions," the environmental conditions are considered as special conditions in this project. Therefore, equipment which can meet such special conditions will be selected for procurement.

2-2-1-4 Policy on Operation and Maintenance

In Cambodia, the dealers do not yet provide a sufficient support system for the operation and maintenance of equipment (particularly vehicles and electronic devices), this situation requires CMAC to execute operation and maintenance by themselves. Since CMAC has acquired a sufficient technical level for operation and maintenance through past activities, there will be no problem in operation and maintenance of equipment if spare parts required for repair work are procured at the same time as the equipment itself.

2-2-1-5 Policy on Establishment of Grade of Equipment

All the procured Brush cutters and detectors passed CMAC's tests. For the safety of the deminers and ease of equipment maintenance, consistency between the equipment owned by CMAC and the equipment to be procured in this project will be maintained by designating pieces of equipment which meet CMAC's

regulations for procurement. Meanwhile, in view of the road and soil conditions in the demining area, four-wheel-drive vehicles with excellent maneuverability will be procured. Waterproof portable transceivers and portable GPS receivers will be procured in order to protect the equipment from water damage caused by unexpected rain or by being accidentally dropped in puddles. General grades will be adopted for other equipment.

2-2-1-6 Policy on Procurement Methods and Implementation Period

In view of the performance and use suitable for the local conditions and the possibility of applying "procurement of designated models," several types of detectors certified by CMAC will be procured. The details of CMAC's certification tests and the reasons for designating certain models are as follows:

- CMAC commissions a third-party institution to conduct highly transparent comparative tests of detectors with other models of the same type, evaluates the results of the tests objectively and grants certification to the models that pass the tests. CMAC uses only certified detectors.

- CMAC assesses not only the comparison of performance but also evaluation by the deminers based on their long experience in practical use of the detectors in the field, which cannot be achieved by a comparison of specifications. CMAC requests the manufacturers of the detectors to improve the quality of their detectors on the basis of the evaluation by the deminers and makes them improve their products.

- CMAC has developed standard operation manuals for demining activities using the certified detectors. It is essential for the deminers to follow these manuals while working. The manuals are revised taking into consideration the evaluation based on practical use of the detectors in the field, as a way of improving the quality of the manuals.

- CMAC takes full responsibility for the use of the detectors chosen by CMAC.

The equipment supplied in the previous Japanese Grant Aid project are highly evaluated by CMAC for its performance and quality. Therefore, brush cutters and station wagons will be procured from Japan.

The spare parts for the existing brush cutters and vehicles, which are to be supplied by the manufacturers of them, will be procured from Japan as far as it is possible. However, the spare parts for pickup trucks that cannot be procured from Japan will

be procured in Thailand. The pickup trucks themselves will be procured in Thailand if they cannot be procured from Japan.

The portable GPS receivers will be procured in Cambodia, because they are readily available there.

The detectors owned by CMAC are the products of third countries. Their performance, quality and services are highly appreciated. Both the deminers and the mechanics are familiar with the detectors currently owned by CMAC. For these reasons and from the viewpoint of safety in the unique work of demining, the request for the procurement of the designated detector models which have passed CMAC's tests is considered appropriate. Therefore, the designated detector models and the designated spare parts for the detectors owned by CMAC will be procured in this project.

The procured equipment will be handed over to the Cambodian side at the training centre in Kampong Chhnang. After the acceptance tests and introductory operation guidance, CMAC will deliver the equipment to each demining site.

The basic policy of procuring equipment of standard specifications from the manufacturers will be adopted wherever possible to reduce the time required for the procurement. A period of seventeen months is assumed as the project period from the conclusion of the E/N to the delivery of the equipment.

A detailed implementation schedule will be prepared and used for confirmation of the progress of the project at each step, including the various procedures to be implemented by the Cambodian side, in order to prevent any delay in project implementation.

2-2-2 Basic Plan (Equipment Plan)

2-2-2-1 Overall Plan

The types, specifications and quantities of the equipment to be procured will be selected and calculated in accordance with the flowchart shown in Figure 2-3. The relevance of the request will then be verified and an equipment plan will be prepared.

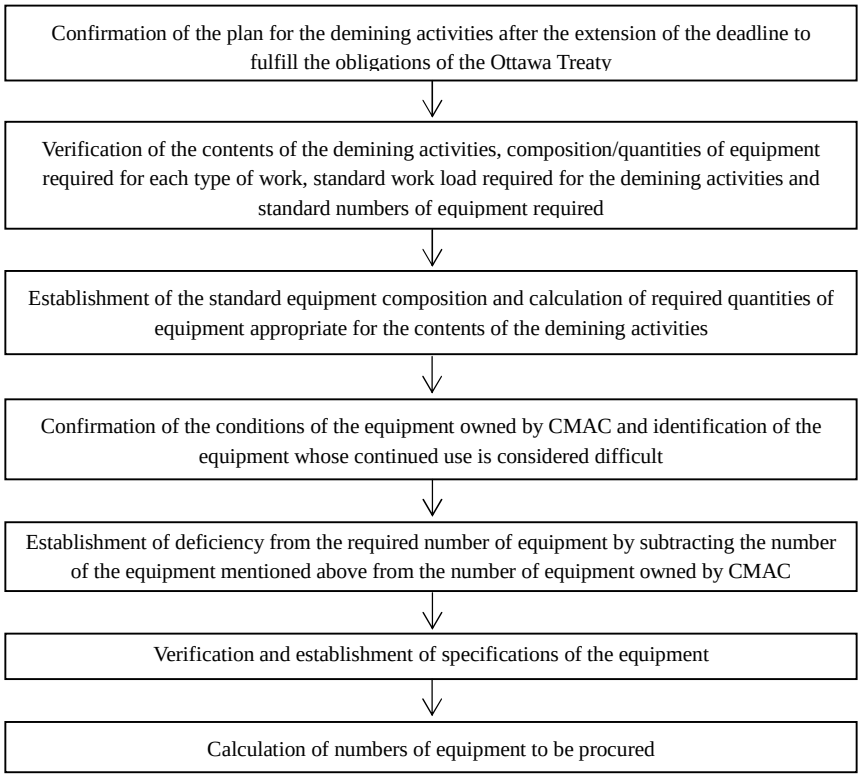


Figure 2-3 Flowchart for the preparation of types, quantities and specifications of the equipment to be procured

(1) Verification of the Demining Work Plan

Although nearly 20 years have passed since the end of the conflict, there are believed to be four to six million land mines left planted and more than 240 million of UXO in Cambodia. As an action against this problem, Cambodia became a signatory to the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction (Ottawa Treaty) on July 28th, 1999. In 2003, the Royal Government of Cambodia declared “Zero Victim” by 2012 and “Impact Free” by 2015 as national goals in the National Mine Action Strategy. However, achievement of “zero victim by 2012” seems unrealistic at present. The Royal Government of Cambodia applied for extension of the deadline for the

fulfillment of the obligations of the treaty up to 2019 in 2010 and the extension was granted.

As complete disposal of anti-personnel landmines in Cambodia is expected to require a long time, their existence will continue to be a major impediment to restoration and development of agriculture, the major industry of Cambodia. Therefore, the establishment of a safe life for the people and promotion of their return and resettlement through demining and assistance for the victims of landmines are recognized as urgent issues to be addressed for the socio-economic development of the country.

Figure 2-4 shows the state of the demining activities in Cambodia (the size of the area free of landmines) at the time of the survey and future plans. Although the number of deaths and injuries caused by land mines can be said to have dropped, there remain a large number of areas requiring demining. Therefore, equipment are highly required.

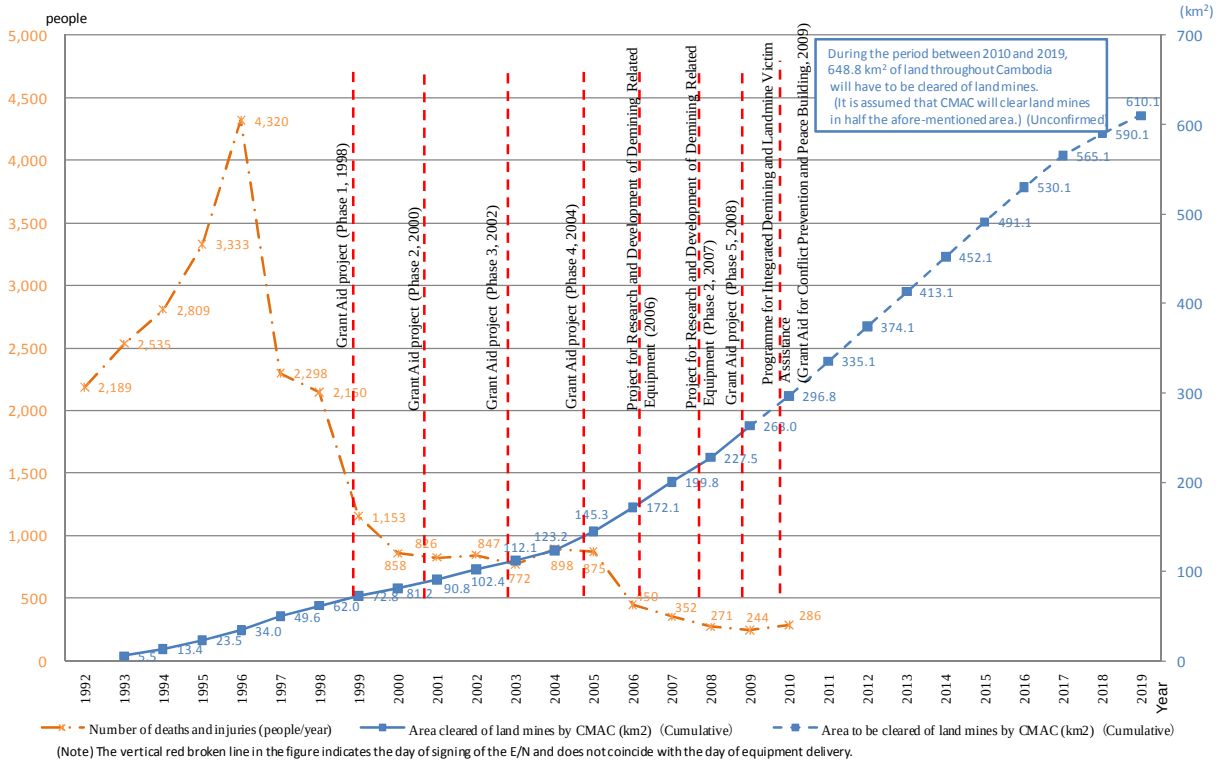


Figure 2-4 Changes in the number of mine casualties and results and plans of demining activities in Cambodia

(2) Establishment of the types and quantities of the equipment

In relation to the mine countermeasure activities of CMAC, activity teams classified into 21 types as shown in Table 3-3 are formed in accordance with the circumstance of the demining activity areas, and equipment required for these teams are defined. Table 2-3 also lists equipment required for activities by DU1 to DU6 and the headquarters, etc.

Table 2-3 Numbers of CMAC activity teams and their staff and quantity of required equipment

Abbreviation		Number of teams	Staff per team	Total number of staff	Types and quantities of main equipment needed by one team to carry out activities															
					Brush cutter	Cargo truck	Pickup truck	Station wagon	Mine detector	Mine/UXO detector	Deep search detector	Manual brush cutters	Generator	Tent (large)	Tent (small)	Protective vest and visor	Portable GPS receiver	VHF handheld transceiver	Microbus	Trailer truck
1	BC	23	8	184	1		1		7	2	2		1	1	1	8	1	3		
2	CBD	3	33	99		1			16	1	1	4		2	1	32	1	3		
3	CBMRR	37	1	37														1		
4	CBURR	33	1	33														1		
5	ERC	3	5	15				1	4	1	1	1			2	5	1	3		
6	CMC (7)	8	7	56				1	7	1	1	1			1	7	1	2		
7	CMC (5)	3	5	15				1	5	1	1	1			1	5	1	2		
8	MPL (31)	8	31	248		1		1	15	1	1	4	1	2	1	30	2	4		
9	MPL (26)	18	26	468		1	1	1	22	2	2	4	1	1	1	25	2	4		
10	MPL (18)	1	18	18		1		1	18	1	1	3	1		2	18	2	3		
11	EDD	5	6	30				1	3	1	1	2	1		1	5	1	2		
12	EOD/ERI	26	3	78			1		1	2	1				1	3	1	3		
13	LLD	4	6	24				1	3	1	1	1	1		1	5	1	2		
14	MRE	6	4	24			1		1				1			2	1	3		
15	SLD	8	10	80				2	3	1	1	2	1		2	9	1	2		
16	TSC	8	5	40			1		3			1			1	5	1	2		
17	BLS	16	5	80			1		3			1			1	5	1	3		
18	CBAT	1	29	29					18	2	1	4		2		29	1	4		
19	BAT	4	16	64		1			4	2	2	3	1		1	14	1	2		
20	BAV	6	7	42				1	4	2	1	1			1	7	2	3		
21	DM	9	3	27			1									2	1	2		
DU1		1	28	28		1	4	1	10	1	1	6	1			10	4	8	1	1
DU2		1	55	55		4	10	5	10	1	1	6	1			10	4	8	1	2
DU3		1	30	30	1	1	2	1	10	1	1	6	1			10	4	8	1	1
DU4		1	30	30		1	2	1	10	1	1	6	1			10	4	8	1	1
DU5		1	24	24	2	1	5	1	10	1	1	6	1			10	4	8	1	1
DU6		1	27	27		2	2	4	10	1	1	6	1			10	4	8	1	1
CWS		1	26	26	1	1	2	2	10											1
TC		1	40	40		2	9	2	15	2	3	3				10	13	21	7	
HQ		1	113	113		8	27	16	2	1	1	14				2	2	5		
Total number of equipment calculated from the above					27(23)	55	150	105	1,078	208	176	246	83	65	132	1,538	216	587	13	8

* The four brush cutters listed for DU3, DU5, and DU6 were procured in 1998 but are not used as brush cutters at present. Therefore, they shall not be included in the required number.

The formal names for abbreviations and the overview of activities of the activity teams are described blow.

1) BC (Brush Cutter)

This team uses brush cutters to remove bushes in an area to be demined and ensures the implementation of mine detection activities. This team also implements mine detection for itself.

2) CBD (Community Base Demining Team)

This team organizes and directs the residents in a target area to carry out demining activities.

3) CBMRR (Community Base Mine Risk Reduction)

To prevent disasters due to contact with mines, this team visits a target area to educate people about dangers of mines and how to dispose of a mine when they find one (The activities are mainly in the north-western part of Cambodia).

4) CBURR (Community Base UXO Risk Reduction)

To prevent disasters due to UXOs, this team visits a target area to educate people about dangers of UXOs and how to dispose of a UXO when they find one (The activities are mainly in the eastern part of Cambodia).

5) ERC (Explosive Remnants of War Clearance Team)

This team clears mines and UXOs in areas for which there are combat records.

6) and 7) CMC (7), (5) (Community Mine Clearance Team)

These teams carry out demining activities with collaboration from local residents. A number enclosed in brackets represents the number of staff.

8) to 10) MPL (31), (26), (18) (Mobile Platoon)

These teams are the central units of CMAC demining activities. The numbers of staff are 31, 26, and 18 in accordance with the scales of target areas.

11) EDD (Explosive (UXO) Detection Dog Team)

This team detects UXOs using mine detection dogs.

12) EOD/ERI (Explosive Ordinance Disposal Team)

This team disposes of mines and UXOs that have been found and removed (for example, by exploding them).

13) LLD (Long-Leash Mine Detection Dog Team)

This team, consisting of members working with mine detection dogs on a long leash, detects mines in a wide range of area in an early stage.

14) MRE (Mine Risk Education)

This team visits a local school or community hall to educate residents about

dangers of mines.

15) SLD (Short-Leash Mine Detection Dog Team)

This team, consisting of staff members working with mine detection dogs on a short leash, performs final check to ensure that there is no mine left.

16) TSC (Technical Survey Team)

This team visits an area not yet completely demined to carry out interview survey on local residents, sampling-based mine detection, etc. and thus determine whether the area is contaminated with mines through data collection and analysis.

17) BLS (Base Line Survey Team)

This team has been formed for the purpose of completing the identification of mine-contaminated areas by 2012 in order to observe the Ottawa Treaty aimed at completion of mine clearance by 2019. Survey that used to be completed in one day per village is completed in one week.

18) CBAT (Community Based Battle Area Clearance)

In areas where combats are said to have occurred, this team carries out demining activities in collaboration with local residents.

19) BAT (Battle Area Clearance Team)

In areas where combats occurred and mines are likely to be buried, this team carries out demining activities.

20) BAV (Battle Area Clearance by Village Team)

In areas where combats are said to have occurred, this team carries out demining activities in collaboration with many residents under the guidance of the CMAC staff.

21) DM (Demining Machine Team)

This team carries out demining activities using demining machines supplied under a Grant Aid for Research and Development and a Grant Aid for Peace Building (construction machines modified into special work devices that directly dig out mines installed underground). This team works in an area that is assumed to have a relatively low level of mine contamination.

(3) Setting of types and quantities of equipment

Each of the equipment to be needed by CMAC for its future activities as described in the previous section was examined to verify the validity of types and quantities of equipment being requested. The result of verification is described below.

Brush cutters	Quantity requested = 12, quantity to be procured = 8

23 Brush cutters have been used by CMAC for demining in 2009. CMAC considers 23 to be the number of Brush cutters sufficient to implement the five-year plan from 2010 on. The total number of Brush cutters provided in the previous Japanese Grant Aid project was 27. Of the 27, four provided in Phase 1 in 1998 are no longer used for demining because the attachments for cutting brush have become useless after long years of use. Therefore, these four Brush cutters will not be replaced.

The average operating hours of the eight Brush cutters procured in Phase 3 of the previous Japanese Grant Aid project in Fiscal 2002 which are currently in use, exceed 10,000 hours (10,304 hours). Taking into consideration the conditions in which they have been used, their functions and operating efficiencies are expected to decline and repair costs are expected to soar sooner or later. Therefore, these eight Brush cutters will be replaced in this project.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2000	EX150C	2	Phase 1	0	0	2
2	2000	PC60-7B	2	Phase 1	0	0	2
3	2003	ZX160LC	8	Phase 3	6	2	0
4	2005	ZX160LC	15	Phase 4	15	0	0
Total			27		21	2	4

Pickup trucks	Quantity requested = 50, quantity to be procured = 50

CMAC has so far acquired a total of 149 pickup trucks, 65 of which were donated by other donors during the period between 1997 and 1998 and the remaining 84 were procured in Phases 1, 3 and 4 of the previous Japanese Grant Aid project.

In the preparation of the equipment plan, the severity of the conditions of use of CMAC's vehicles (use on soft roads in the rainy season and very rough earthen roads) and the scope of the maintenance work were taken into consideration. Using the following two as the criteria, the pickup trucks requiring replacement were then identified for the procurement plan.

1) The pickup trucks manufactured before 2000 will be replaced in this project because their dilapidated condition, such as rust on the body, is beyond repair and their continued use is considered difficult.
2) Vehicles with a cumulative mileage of over 250,000 km as of October 2010 will be replaced in this project because their suspension systems and engines have been damaged so much that a large increase in the repair costs is apprehensive.

Either or both of the two conditions apply to 65 trucks manufactured before 2000 and 11 trucks manufactured in or after 2000 which have a cumulative mileage of over 250,000 km.

The above-mentioned examination produces the figure of 76 as the quantity of vehicles to be replaced. However, as it was decided to use the quantity requested by CMAC as the upper limit of the quantity of the equipment to be procured, 50 pickup trucks will be procured in this project.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	1995-98	TOYOTA 4WD	65	UNTAC[1]※	59	3	3
2	2000	ISUZU 4WD	11	Phase 1	11	0	0
3	2003	TOYOTA 4WD	28	Phase 3	28	0	0
4	2005	TOYOTA 4WD	45	Phase 4	45	0	0
Total			149		143	3	3

Station wagons	Quantity requested = 67, quantity to be procured = 58

CMAC has so far acquired a total of 111 station wagons, 49 of which are old vehicles donated by other donors during the period between 1993 and 1999 and 54 of which were procured in Phases 1, 3 and 4 of the previous Japanese Grant Aid project. CMAC has eight station wagons donated by other donors after 2000. In the preparation of the equipment plan, the same criteria as those for the pickup trucks were used for the identification of the station wagons to be replaced.

As a result, 49 vehicles manufactured before 2000 and nine vehicles manufactured in or after 2000 which have a cumulative mileage of over 250,000 km were identified for replacement.

From the examination mentioned above, it was decided that 58 station wagons would be procured in this project.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	1993-99	TOYOTA LAND CRUISER	49	Various	48	1	0
2	2000	ISUZU BIGHORN	8	Phase 1	7	1	0
3	2000	ISUZU BIGHORN	13	Phase 1	13	0	0
4	2001	ISUZU BIGHORN	12	Phase 2	12	0	0
5	2005	TOYOTA LAND CRUISER	21	Phase 4	21	0	0
6	2000-09	Various	8	Various	8	0	0
Total			111		109	2	0

Mine detectors, Minelab F3S	Quantity requested = 191, quantity to be procured = 221

The lives of not only the deminers but also the land users after demining depend on the performance of the mine detectors. Since the life of a mine detector is the duration for which the manufacturer guarantees its detection function (sensitivity), it is inappropriate to use detectors far beyond the expiry of their life. 599 Minelab-F1A4s currently in use and to be replaced by Minelab F3Ss were last procured in 2005 in Phase 4 of the previous Japanese Grant Aid project. Because those delivered before 2000 have the following problems, they will be replaced in this project.

1. Although their use can be continued with repairs like other general equipment, their continued use will cost a lot because of the frequent need for repair.
2. Even with repair, deterioration in their performance is inevitable. CMAC is having a hard time because of the declining efficiency and quality of demining. For example, as malfunctioning of the detectors often happens during the heat of the day, such detectors can be used only in the relatively cool mornings.

Of the 1,144 detectors purchased before 2000, 221 currently in use will be replaced to ensure the quantity of the detectors required for demining activities. In addition to F1A4s and F3s, CEIAs which have been procured since 2008 are being used. However, because CEIAs and F3s are used for different types of soil, CEIAs will not be replaced by F3s.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	1993-00	Schiebel etc	636	Various	4	0	632
2	2000	Min F1A4	200	Phase 1	52	40	108
3	2003	Min F1A4	400	Phase 3	122	71	207
4	2004	Min F1A4	600	Phase 4	208	130	262
5	1996-00	Min F1A4	994	Various	169	73	702
6	2000-09	Various	8	Various	8	0	0
7	2005-08	Min F3-J	175	Various	111	56	8
8	2009	Min F3-J	388	Phase 5	294	94	0
9	2008,09	CEIA MILD1	35	Peace building	15	18	2
10	2009	CEIA MILD1	100	Phase 5	0	100	0
Total			3536		983	582	1921

Mine/UXO detectors, Minelab F3S	Quantity requested = 183, quantity to be procured = 184

One hundred and twenty-one teams require UXO detectors and each team requires one or two detectors. Therefore, a total of 208 mine/UXO detectors are required. As 24 F1A4UXO are currently available, there is a shortage of 184 detectors.
This figure of 184 will be adopted as the number of mine/UXO detectors to be procured in this project.
Because UXO clearance activities are gaining importance in CMAC's activities, the demand for UXO detectors is also on the increase.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2005	Min F1A4 UXO.	24	Phase 4	11	13	0
2	2008-09	CEIA MIL D1/DS	23	Peace building, in Cambodia	3	20	0
3	2009	CEIA MIL D1/DS	14	Phase 5	0	14	0
Total			61		14	47	0

Deep search detector, Ebinger UPEX 740M	Quantity requested = 113, quantity to be procured = 87

One hundred and twelve teams require Ebinger UPEX 740Ms and each team requires one or two. Therefore, a total of 176 Ebinger UPEX 740Ms are required. As 89 Ebinger UPEX 740Ms, including 13 in stock, are currently available, the remaining 87 Ebinger UPEX 740Ms will be procured in this project.
In recent years, because of the promotion of mechanization in the agricultural sector, accidents caused by contact with anti-tank mines and mines planted deep in the ground are on the increase. Therefore, screening of areas with an Ebinger UPEX 740M after demining is essential. However, because of the small number of Ebinger UPEX 740Ms available at CMAC, there are isolated cases in which post-clearance survey is not implemented sufficiently. Therefore, in addition to renewal of the existing detectors which are barely usable, procurement of additional detectors is required.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2001--08	UPEX740M	28	Various	16	3	9
2	2005	UPEX740M	48	Phase 4	37	6	5
3	2009	UPEX740M	27	Phase 5	23	4	0
4	2009	Forex4.032	7	Peace building	7	0	0
5	2009	Forex4.032	3	Phase 5	0	3	0
Total			113		83	16	14

Tents (size: 6.0 m × 10.0 m)	Quantity requested = 12, quantity to be procured = 32

A CMAC demining team establishes a base and implements demining activities continuously for one week to a few months in each place. Since all the demining team members live in tents for the duration, the quality of the living conditions in the tents affects the safety of demining activities.
Sixty-three tents were procured in April 2001 in Phase 2 of the previous Japanese Grant Aid project. Almost half of them (31) are unusable. The remaining 32 tents currently in use have holes and tears in them and ugly large black spots of black mold growing on them. Thus, these tents provide an extremely poor living environment for the deminers. Since 2007, CMAC has received 15 Mobile-Tents from another donor. However, as these new tents were manufactured in Cambodia, they are significantly inferior to those manufactured in Japan in terms of ventilation, etc.
Therefore all 32 tents procured in 2001 which are currently in use will be replaced in this project.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2001	Tent-1	63	Phase 2	32	0	31
2	2007-09	Mob Tent-1	15	Various	15	0	0
Total			78		47	0	31

Tents (size: 3.5 m × 7.0 m)	Quantity requested = 60, quantity to be procured = 54

As is the case with the 6.0 m x 10.0 m tents, this equipment is closely linked to the safety of the work of the deminers.
A total of 143 tents of this type were procured, 27 in Phase 2 of the previous Japanese Grant Aid project in April 2001 and 116 in Phase 3 in April 2003. Although only a small number (31) of them are unusable, the rest are also in very poor condition, as is the case with the 6.0 m × 10.0 m tents, and it is difficult to continue to use them. Since 2007, CMAC has similarly received 12 Mobile-Tents manufactured in Cambodia from another donor. However, they are significantly inferior in terms of ventilation, etc.
In this project, a total of 54 tents, all 21 tents procured in 2001 and 33 severely damaged tents among those procured in 2003, all of which are currently in use, will be replaced.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2001	Tent-2	27	Phase 2	21	0	6
2	2003	Tent-2	116	Phase 3	91	0	25
3	2007-10	Mob Tent-2	12	Various	12	0	0
Total			155		124	0	31

Protective vests	Quantity requested = 331, quantity to be procured = 0

Because protective vests are relatively inexpensive and are locally available for purchase, they will not be included in the equipment to be procured in this project.

Protective visors	Quantity requested = 1,450, quantity to be procured = 0

For the same reason as the protective vests, protective visors will not be included in the equipment to be procured in this project.

Grass cutters	Quantity requested = 205, quantity to be procured = 0

Because grass cutters are relatively inexpensive and are locally available for purchase, they will not be included in the equipment to be procured in this project.

Portable GPS receivers	Quantity requested = 234, quantity to be procured = 117

Portable GPS receivers are very important, because they clearly show the locations where demining activities have been implemented on the map and show information on dangerous locations accurately to residents and other people concerned.

CMAC has acquired a total of 330 portable GPS receivers since 2000, 42 of which were procured in Phase 3 of the previous Japanese Grant Aid project.

The current composition of CMAC units requires 216 portable GPS receivers. Since CMAC currently owns 227 receivers classified as usable, the requirement can be met with the receivers currently owned by CMAC with some back-up.

Portable GPS receivers manufactured before 2006 did not have any problems then because they had the latest performance at that time. However, since the Royal Government of Cambodia demands improvement in operational efficiency in such work as confirmation of the borders of cleared areas when it allows people access to those areas, it is difficult to meet this demand with the equipment they have. The current models of portable GPS receivers are more accurate. The problems of the receivers currently owned by CMAC are:

1. Since the satellite capture/recapture time of the old model is longer than that of the latest model, it takes longer to collect data with the older model than with the latest one, especially when there are obstacles (such as housings or trees).
2. Since the old model has poorer connectivity with a personal computer (PC) than the latest model, it takes longer to import data to the PC with the old model and the slow data import adversely affects data sorting.
3. While the latest model has built-in map information, the old model does not. Therefore, it is difficult to verify collected positional information on the spot.
4. Since production of the old model has been discontinued, it is difficult to obtain spare parts, as is the case with other electronic equipment from those days.
5. The old model is inferior in accuracy of data to the latest model, because of intrinsic mechanical errors, secular change of parts and low antenna sensitivity, etc.

Therefore, 117 GPS receivers which have problems in ensuring the improvement of operational efficiency will be replaced in this project.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2000-06	Mage 12XL	118	Various	72	0	46
2	2005	Mage 12XL	42	Phase 4	34	0	8
3	2003	Mage 76	14	Various	11	0	3
4	2007-09	MAP 60	81	Various	47	0	34
5	2009-10	MAP 60CSx	75	Various	63	0	2
Total			330		227	0	93

VHF handheld transceivers	Quantity requested = 347, quantity to be procured = 205

This equipment is to be used for transmission of information on detonation at demining sites and, therefore, is essential for ensuring the safety of operations.
Since the first batch was handed over by UNTAC in 1993, CMAC has acquired a total of 1,005 VHF handheld transceivers, 464 of which were procured in Phases 1, 3 and 4 of the previous Japanese Grant Aid project.
However, only approx. 45%, or 467, are currently operational and more than half are unusable because of breakdown. Of the various models procured, only 27% of the ICOM VHF Handheld IC-F14s procured in Phase 4 of the previous Japanese Grant Aid project have broken down. This is the reason why CMAC strongly requests procurement of this model.
The results of the survey reveal that CMAC requires 554 handhelds, and since it has 467 operational handhelds, the shortage is 87. If the severe environment in which the VHF handheld transceivers are used, such as outdoor use in the rainy season, is taken into consideration, the life of five years established by CMAC for this equipment is appropriate. Therefore, although they are currently operational, 118 transceivers procured before 2004 will also be replaced in this project.
The above-mentioned gives a total of 205 as the number of VHF handheld transceivers to be procured.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2000	GP68	26	Phase 1	4	0	22
2	2003	VX-160V	195	Phase 3	62	0	133
3	2005	ICOM ICF14	243	Phase 4	178	0	65
4	1993-04	GP300	190	Various	40	0	150
5	2005-10	GP300	126	Various	92	0	34
6	1996-04	KENWOOD	33	Various	1	0	32
7	2005-08	KENWOOD	45	Germany, France	28	0	17
8	1993-04	Various	76	Various	11	0	65
9	2005-09	Various	71	Various	51	0	20
Total			1005		467	0	538

Generators (3kVA)	Quantity requested = 28, quantity to be procured = 27

This equipment is used for charging the batteries of the detectors, portable GPS receivers and VHF handheld transceivers. CMAC has so far procured a total of 98 generators with a capacity of 10kVA or less, 64 of which were procured in the previous Japanese Grant Aid project. (Fifty-one are in use and 13 are beyond repair.) The remaining 34 have been provided by other donors, such as Germany, since 1994. Twenty are in use and 14 are beyond repair. Various types of generators manufactured in China, Thailand and elsewhere are commercially available in Cambodia. However, CMAC points out that those generators are less durable and of poorer quality than those manufactured in Japan and it strongly requests procurement of Japanese-made generators.
Therefore, replacement of the 27 generators beyond repair will be included in this project.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2000	Denyo 3 kVA	4	Phase 1	3	0	1
2	2000	Denyo 5 kVA	2	Phase 1	2	0	0
3	2001	YAMAHA 5 kVA	8	Phase 2	5	0	3
4	2005	YAMAHA 3 kVA	10	Phase 4	6	0	4
5	2005	YAMAHA 5 kVA	40	Phase 4	35	0	5
6	1994-09	Various	34	Various	20	0	14
Total			98		71	0	27

Spare parts for Brush cutters	Quantity requested = 1 set, quantity to be procured = 1 set
The spare parts are required for regular maintenance and repair of the Brush cutters currently in operation. While replacements for the eight Brush cutters procured in Phase 3 of the previous Japanese Grant Aid project will be procured in this project, use of the 15 Brush cutters procured in Phase 4 will have to be continued by performing regular maintenance and repair. Procurement by CMAC of the spare parts required for regular maintenance and repair is considered very difficult because the manufacturer of the Brush cutters has no agents in Cambodia. Therefore, the spare parts for the maintenance work required for the three-year period from the commencement of this project in 2012 till the end of CMAC's five-year plan (2010 - 2014) in 2014 will be procured in this project. In CMAC's request, the spare parts for the Brush cutters and vehicles were listed collectively under the title "Spare Parts for Brush cutters and Vehicles." However, since they are supplied by different suppliers, the parts for the Brush cutters and those for the vehicles are listed separately in this document.	

Spare parts for vehicles	Quantity requested = 1 set, quantity to be procured = 1 set
CMAC owns a total of 260 vehicles including 146 vehicles acquired before 2000. While these 108 vehicles are to be replaced in this project, use of the remaining 152 vehicles is to be continued with regular maintenance and repair. As these vehicles will continue to be important in maintaining the current level of CMAC's demining capacity, it will be essential to maintain these vehicles in good working order by performing the necessary repairs. While the manufacturers of vehicles naturally demand the use of genuine spare parts manufactured by the manufacturers of the parts concerned for reasons of vehicle maintenance, in reality, a large variety of "imitation" spare parts are commercially available in Cambodia. Therefore, the adopted policy of this project is to exclude spare parts considered unlikely to significantly affect the performance of the vehicles, such as engine oil filters, from the parts to be procured in this project and to procure the important spare parts, such as piston rings, required for the maintenance work for the three-year period from the commencement of this project in 2012 till the end of CMAC's five-year plan (2010 - 2014) in 2014.	

Spare parts for mine detectors	Quantity requested = 1 set, quantity to be procured = 1 set
Three types of mine detectors, 492 in total, are to be procured in this project. However, since the use of the mine detectors currently in use (Minelab F1A4s, Minelab F1A4UXOs, Minelab F3Js and Ebinger UPEX 740Ms) will have to be continued, it will be necessary to repair them when they break down. Moreover, in order to prevent erroneous action of the detectors while in use, the quality of the repair work will have to be guaranteed by the use of appropriate spare parts whose performance is guaranteed. Therefore, the spare parts required for the maintenance work for the three-year period from the commencement of this project in 2012 till the end of CMAC's five-year plan (2010 - 2014) in 2014 were selected from the list of spare parts prepared by CMAC on the basis of past repair data. A set of the selected spare parts will be procured in this project.	

Tools for the workshops	Quantity requested = 3 sets, quantity to be procured = 0 set
Two to three mechanics are mainly engaged in regular maintenance work and simple repair of vehicles at each of the six DU workshops in Cambodia. When a vehicle breaks down at a demining site, they put hand tools in a pickup truck, drive to the site and repair the broken-down vehicle. If the cause of breakdown is too complex to handle with the equipment at the DU workshop, the vehicle concerned is handled at the Central Workshop. Procurement of equipment (a set of tools for the workshops) for complicated repair work was included in the request for this project. However, the procurement was considered unnecessary for the following reasons. 1) It is physically impossible to install the tools in any of the existing workshops. 2) A mobile workshop equipped with a set of repair tools and a set of repair tools to enable a CMAC truck (one of the cargo trucks procured in Phase 3 of the previous Japanese Grant Aid project) to serve as a mobile workshop have already been provided in Phase 5 of the previous Japanese Grant Aid project. Both of them are dispatched at least twice a month and are used effectively.	
Small bulldozer	Quantity requested = 1, quantity to be procured = 0
This equipment is considered as equipment required not only for demining but also for community development. Since the objective of this project is to maintain and improve CMAC's capacity in demining, the small bulldozer will not be included in the equipment to be procured.	
Dump trucks	Quantity requested = 2, quantity to be procured = 0
For the same reason as the small bulldozer mentioned above, dump trucks will not be included in the equipment to be procured.	
Motor grader	Quantity requested = 1, quantity to be procured = 0
This equipment is undeniably useful in the construction of access roads to demining sites during and immediately after the rainy season. However, since its main use is considered to be community development, as is the case with the small bulldozer and dump trucks, it will not be included in the equipment to be procured.	
Roller compactor	Quantity requested = 1, quantity to be procured = 0
For the same reason as the above-mentioned motor grader, a roller compactor will not be included in the equipment to be procured.	
Buses (45-seater)	Quantity requested = 2, quantity to be procured = 0
Although this equipment is supposedly used to transport people attending training courses held in Kampong Chhnang, the need to transfer 45 people from one place to the training centre in Kampong Chhnang seems to arise very rarely. Moreover, since there are no manufacturers in Japan which can manufacture the equipment concerned as a whole, chassis manufactured in Japan would have to be exported to and customized in Thailand. However, it would be difficult to meet the conditions of this project for delivery in a short period of time by this method. Therefore, the buses will not be included in the equipment to be procured.	

Microbuses	Quantity requested = 7, quantity to be procured = 7

CMAC is implementing 42 training courses for the personnel engaged in demining for a total of 18,000 person·day. Therefore, transportation of personnel from the demining sites to the training centre in Kampong Chhnang will continue to be important.

Cargo trucks procured in the previous Japanese Grant Aid project are currently used for the transportation of personnel. However, as they have to travel approx.300 km, cargo trucks are not considered an appropriate means of transport.

Therefore, as requested by CMAC, seven microbuses with a seating capacity of 12 to 15 people will be procured for each of the six DU offices and the head office of CMAC in this project.

Trailers	Quantity requested = 2, quantity to be procured = 0

All seven trailers owned by CMAC were procured with Japanese assistance, two each in Phases 1, 3 and 4 of the previous Japanese Grant Aid project and one in a peace building project.

The trailers are used mainly to transport Brush cutters from one demining site to another or for large- and medium–scale repair of Brush cutters. Since eight new Brush cutters will be procured to replace the old Brush cutters in this project, the frequency of transportation of Brush cutters for repair is expected to decrease significantly. Therefore, trailers will not be included in the equipment to be procured.

	Year of procurement	Model	Quantity	Project phase	Number in use	In workshop for repair	Unusable
1	2001	ISUZU T/T	2	Phase 1	2	0	0
2	2003	ISUZU T/T	2	Phase 3	2	0	0
3	2005	ISUZU T/T	2	Phase 4	2	0	0
4	2008	ISUZU T/T	1	Peace building	1	0	0
Total			7		7	0	0

Photovoltaic power generation systems (10 kVA)	Quantity requested = 3 sets, quantity to be procured = 0 set

Because commercial electricity is expensive in Cambodia and the electricity bill is a large budgetary burden, large generators are used as the power source at DU4, DU5 and the training centre in Kampong Chhnang. CMAC requested procurement of photovoltaic panels as the power source for these three places since solar energy has been the focus of attention in recent years as a source of clean energy and operation of the system costs little.

However, because they do not contribute directly to the demining activities even though they lead to improved operation and maintenance of the offices, this equipment will not be included in the equipment to be procured.

(3) Establishment of the specifications of the equipment

Table 2-4 shows the main specifications of equipment to be supplied and the reasons for setting of them.

Table 2-4 Equipment plan (1/3)

No.	Equipment name	Main specifications	Reasons for selection of specifications
1	Brush cutter	1) Base: Swing hydraulic excavator 2) Operating weight: 16 tons – 21 tons 3) Engine output: 73 kw or more 4) Attachments: Hydraulic rotary cutter, 0.6 m^3 bucket and blade 5) Cab: Special reinforced cab (against flying objects) 6) Crawlers: Triple grouser track shoe, width 500 mm	Eight and fifteen Brush cutters were procured in 2003 and 2005, respectively, in a Japanese Grant Aid project and all of them are in use. However, since the eight procured in 2003 are in very poor condition after long years of use, eight Brush cutters will be procured in this project to replace them. Therefore, specifications identical in principle to those of the Brush cutters owned by CMAC were adopted for the Brush cutters to be procured.
2	Pickup truck	1) Seating capacity: 5 or 6 2) Gross vehicle weight: 2,700 kg – 2,900 kg 3) Engine type: Diesel engine 4) Engine output: 70 kW or more 5) Transmission: Manual, F5 – R1 6) Drive system: Four-wheel-drive	It will transport deminers, materials and equipment to and from demining sites. Most of the access roads to these sites are lateritic earthen roads. Because of the poor condition of these roads in the rainy season and dry season, the specifications were set for being suitable for driving on such poor roads.
3	Station wagon	1) Seating capacity: 7 or more 2) Gross vehicle weight: 2,750 kg - 3,200 kg 3) Engine type: Diesel engine 4) Engine output: 85 kW or more 5) Transmission: Manual, F5 – R1 6) Drive system: Four-wheel-drive 7) Number of doors: 3 or 5	It will mainly transport mine detection dogs and deminers. The condition of the roads they will use is the same as above. Therefore, specifications designed for driving on bad roads and suitable for transporting detection dogs were adopted.
4	Mine detector	1) Model: Minelab F3 2) Total length: 76 cm (minimum) – 150 cm (maximum) 3) Operating weight: 3.2 kg 4) Power source: Rechargeable batteries (size D) 5) Water-proofing: IP67 6) Function: Compliant with CMAC standards	It will be used at the forefront of demining activities and, thus, can be called equipment which will save human lives. Therefore, CMAC enforces strict performance testing of the mine detectors. CMAC has been using this equipment as its main mine detectors since it passed the tests in 2000. Specifications exactly identical to those which have been used so far were adopted in this project.
5	Mine /UXO detector	1) Model: Minelab F3 UXO 2) Total length: 76 cm (minimum) – 150 cm (maximum) 3) Operating weight: 4.1 kg 4) Power source: Rechargeable batteries (size D) 5) Water-proofing: IP67 6) Function: Compliant with CMAC standards	UXO clearance has become increasingly important in recent years in Cambodia (in the east, in particular). Since 2005, F1A4s have been procured and used for UXO clearance. In this project, specifications corresponding to the large head for UXO detection attached to the latest model mine detector, F3S, were adopted for the UXO detector.

Equipment plan (2/3)

No.	Equipment name	Main specifications	Reasons for selection of specifications
6	Deep search detector	1) Model: EBINGER UPEX 740M – with separate frame, measurement part and battery part 2) Frame dimensions: approx. 145 cm × 245 cm 3) Weight: Frame – 2.5 kg, Measurement part – 0.9 kg, Battery part – 1.1 kg 4) Power source: Rechargeable batteries (size C) 5) Usable in water 6) Function: Compliant with CMAC standards	This detector has already passed CMAC's tests and is used for deep searches. CMAC personnel involved in UXO detection are familiar with the use of this detector. It is also used for confirmation of complete demining after demining operation in addition to UXO detection. It is operated by workers in pairs. Since it can search a wide area, it is used as a standard deep search detector.
7	Tent (size: 6.0 m × 10.0 m)	1) Type: Gabled cloth tent 2) Dimensions: 10 m (L) × 6 m (W) × 3.2 m (H) 3) Number of doors/windows: 2 doors/8 windows 4) Material: Warp: polyester, woof: vinylon, PVC-coated, waterproof capacity: 1500 mm 5) Frame material: φ35mm or more, aluminum alloy structural pipes	It is larger than the tent shown in No.8 which is used as a living base for large teams such as demining teams (18 to 37 personnel) living and working in the field. Therefore, it has to provide a tolerable living environment in a humid climate and be easy to move from one place to another. The specifications were adopted after taking these issues into consideration.
8	Tent (size: 3.5 m × 7.0 m)	1) Type: Gabled cloth tent 2) Dimensions: 10 m (L) × 6 m (W) × 3.2 m (H) 3) Number of doors/windows: 2 doors/6 windows 4) Material: Warp: polyester, woof: vinylon, PVC-coated, waterproof capacity: 1500 mm 5) Frame material: φ30mm or more, steel structural pipes	It is smaller than the tent shown in No.7 which is used as a living base for small teams such as demining teams (6 to 8 personnel) living and working in the field. Therefore, it has to provide a tolerable living environment in a humid climate and be easy to move from one place to another. The specifications were adopted after taking these issues into consideration.
9	Portable GPS receiver	1) Dimensions of main body: approx. 6 cm (W) × 16 cm (H) × 3.5 cm (D) 2) Weight of main body: 260 g – 280 g 3) Dimensions of display: at least 4 cm (W) × 5.5 cm (H) 4) Continuous operating hours: 18 hours or longer (Size-AA batteries) 5) Memory size: 1 GB or more 6) Maximum measuring points: 1,500 or more 7) Built-in basic map information 8) Waterproofing: IPX7 or above	This equipment is for accurately locating the area where demining activities have been completed and providing accurate data to the map information. A location accuracy of 10m is required. It is required to have waterproofing to withstand use in the rainy season in hot and humid Cambodia. Ease of data handling was taken into consideration.

Equipment plan (3/3)

No.	Equipment name	Main specifications	Reasons for selection of specifications
10	VHF handheld transceiver	1) Type: VHF handheld transceiver 2) Frequency band: 136 MHz – 174 MHz 3) Number of channels: 16 or more 4) Output: 5 W 5) Power source: Rechargeable batteries (size AA) 6) Applicable standards: United States Military Standard 810 test series 7) Carrying case 8) Waterproofing: IPX7 or above	While demining activities are being carried out and in particular when a discovered land mine is about to be detonated, VHF handhelds are used to inform all those concerned of the detonation to make sure all have evacuated safely. The specifications given on the left were established on the basis of the provisions of the Radio Wave Act of Cambodia and the specifications of the VHF handhelds procured so far.
11	Generator (3kVA)	1) Rated output: 3.0 kVA or above, 220V 50Hz 2) Engine type: Air-cooled diesel engine 3) Dimensions: approx. 55 cm (W) × 50 cm (L) × 50 cm (H) 4) Weight: approx. 50 kg 5) Continuous operating hours: 2 hours or longer 6) Starter: recoil starter	The generators will be used for charging the rechargeable batteries of the detectors, portable GSP receivers and VHF handheld transceivers. These types of equipment use different types of rechargeable batteries (custom-made, size AA, C, D, etc.), each of which has to be charged with its own charger. The specifications on the left were established as sufficient to perform the work mentioned above.
12	Spare parts for Brush cutters	Spare parts required for the maintenance and repair of 15 of the 23 16-ton-class Brush cutters owned by CMAC which will continue to be used.	Parts required for maintaining the operating rate of the Brush cutters at the current level for a period of three years will be procured. In practice, parts required for regular maintenance work, such as various filters and parts likely to be abraded, such as the teeth of the rotary cutter and suspension parts, will be procured.
13	Spare parts for vehicles	Toyota and Isuzu parts required for the maintenance and repair of 152 medium- and small-sized vehicles of the 260 vehicles currently owned by CMAC, which will continue to be used in future.	Types and quantities of parts for the maintenance work required for a three year period from 2012 have been identified on the basis of the records of use of parts at the CMAC Central Workshop.
14	Spare parts for mine detectors	Of the 1,725 detectors, including those kept for repair, owned by CMAC, parts required for maintenance and repair of the main equipment, MinF1A4, Min F3J, UPEX 740M, whose continuous use is required.	Types and quantities of parts for the maintenance work required for a three year period from 2012 have been identified on the basis of the records of use of parts at the CMAC Central Workshop.
15	Microbus	1) Seating capacity: 12 to 15 people 2) Gross vehicle weight: 2,700 kg - 3,100 kg 3) Engine type: Diesel engine 4) Engine output: 68 kW or more 5) Transmission: Manual, F5 – R1 6) Drive system: two-rear-wheel-drive 7) Body type: one-box-type with 3 or 4 doors	It will be used for transporting trainees from Demining Units 1 - 6 to the CMAC Training Centre in Kampong Chhnang. The roads to be used by the microbuses are well-maintained trunk roads and the number of trainees to be transported at one time is about 10. On this basis, the specifications on the left were established.

2-2-2-2 Equipment Plan

Table 2-5 shows the outline of the equipment plan prepared on the basis of the content of the request from the implementing agency, CMAC, and the results of preparation of the plan mentioned above. Equipment that costs less than one million yen per unit is omitted.

Table 2-5 Outline of equipment plan

No.	Equipment name	Main specifications	Requested quantity (stated on the Request)	Requested quantity (when signing M/M)	Quantity to be procured	Intended use, etc.
1	Brush cutter	1) Base: Swing hydraulic excavator 2) Operating weight: 16 tons – 21 tons 3) Engine output: 73 kw or more 4) Attachments: Hydraulic rotary cutter, 0.6 m^3 bucket and blade 5) Cab: Special reinforced cab (against flying objects) 6) Crawlers: Triple grouser track shoe, width 500 mm	12	12	8	Removal of shrubs before demining
2	Pickup truck	1) Seating capacity: 5 or 6 2) Gross vehicle weight: 2,700 kg – 2,900 kg 3) Engine type: Diesel engine 4) Engine output: 70 kW or more 5) Transmission: Manual, F5 – R1 6) Drive system: Four-wheel-drive	50	50	50	Transportation of staff and equipment
3	Station wagon	1) Seating capacity: 7 or more 2) Gross vehicle weight: 2,750 kg - 3,200 kg 3) Engine type: Diesel engine 4) Engine output: 85 kW or more 5) Transmission: Manual, F5 – R1 6) Drive system: Four-wheel-drive 7) Number of doors: 3 or 5	67	67	58	Transportation of staff and equipment
4	Deep search detector	1) Model: EBINGER UPEX 740M – with separate frame, measurement part and battery part 2) Frame dimensions: approx. 145 cm × 245 cm 3) Weight: Frame – 2.5 kg, Measurement part – 0.9 kg, Battery part – 1.1 kg 4) Power source: Rechargeable batteries (size C) 5) Usable in water 6) Function: Compliant with CMAC standards	113	113	87	Detection of objects and UXO buried at significant depth. Operated by a team of two to search a large area.
5	Tent (size: 6.0m x 10.0m)	1) Type: Gabled cloth tent 2) Dimensions: 10 m (L) × 6 m (W) × 3.2 m (H) 3) Number of doors/windows: 2 doors/8 windows 4) Material: Warp: polyester, woof: vinylon, PVC-coated, waterproof capacity: 1500 mm 5) Frame material: φ35mm or more, aluminum alloy structural pipes	12	12	32	Portable tent for accommodation of deminers
6	Microbus	1) Seating capacity: 12 to 15 people 2) Gross vehicle weight: 2,700 kg - 3,100 kg 3) Engine type: Diesel engine 4) Engine output: 68 kW or more 5) Transmission: Manual, F5 – R1 6) Drive system: two-rear-wheel-drive 7) Body type: one-box-type with 3 or 4 doors	60	60	7	Transportation of deminers during training

Equipment that costs more than one million yen per unit

2-2-3 Implementation Plan

2-2-3-1 Implementation policy

(1) Implementing agency

The implementing agency of this project on the Cambodian side is CMAC. CMAC will be responsible for operation and maintenance of the equipment. In accordance with the Grant Aid scheme, execution design and procurement supervision will be carried out by a Japanese consultant. Another Japanese corporation will be the main contractor for the supply of the equipment to be procured in this project.

(2) Consultant

After the conclusion of the E/N, CMAC will conclude a consultancy agreement with a Japanese consultant on implementation of this project. The consultant, under the contract with CMAC, will provide engineering services including execution design of the equipment to be procured in this project, preparation of tender documents, assistance in the tender, procurement supervision and responsibility for the equipment to be procured in this project until the completion of its handover.

(3) Suppliers

In a general competitive tender with qualification for tender participation, the bidder who passes the examination on required quality and specifications and makes a successful bid will conclude an agreement with CMAC to deliver the equipment included in this project. The supplier will deliver, adjust, run trials of and provide introductory operation guidance on the equipment within the period provided in the agreement.

2-2-3-2 Implementation Conditions

Although the implementing agency, CMAC, is familiar with the implementation procedures of Japanese Grant Aid projects because it was the recipient of equipment for demining procured in the five phases of a Japanese Grant Aid project from Fiscal 1998 to Fiscal 2008, it will be necessary to ensure that there is no delay or nonfulfillment of their responsibilities by providing ample explanation and holding due meetings with them at each implementation stage.

Equipment procured from Japan and third countries will be transported by sea to the port of Sihanouk Ville, unloaded there, transported by land to the training centre in Kampong Chhnang and handed over to the Cambodian side there. However, of the equipment procured from “third countries”, some of the Spare parts for vehicles will be transported by land from Thailand to Poipet and then overland to the training centre and handed over to the Cambodian side.

The equipment supplier will take necessary measures to ensure that there will be no dispute with the Cambodian side regarding warranty against any damage or theft which may occur during the sea and land transport and unloading.

2-2-3-3 Scope of Works

The Japanese side will bear all the costs and implement all the work for the delivery of the equipment to the place of handover, the training centre in Kampong Chhnang. The Cambodian side will bear all the expenses required for obtaining tax exemptions on the imported equipment. Table 2-6 shows the scope of works of both the Cambodian and Japanese sides.

Table 2-6 Scope of works

Items	Borne by the Japanese side	Borne by the Cambodian side	Remarks
1. Equipment procurement			
Costs of equipment procurement	●		
Costs of sea transport of equipment	●		From the procurement source to the Port of Sihanouk Ville
Costs of land transport of equipment	●		From the Port of Sihanouk Ville or Poipet to the training centre in Kampong Chhnang
Unpacking and installation of equipment	●		
Adjustment and test run of the equipment	●		
Introductory operation guidance on the equipment	●	●	
Delivery of equipment to project sites			Transport from the training centre in Kampong Chhnang to each project site
2. Tax-exemption procedures		●	

2-2-3-4 Consultant Supervision

(1) Basic Policy of Procurement Supervision

If this project is to be implemented as a Japanese Grant Aid project, an implementation structure with personnel with ample experience in execution design and procurement supervision deployed in the right places will be established for execution of the execution design and procurement supervision, with attention paid to the issues listed below.

1) Preparatory Survey Report
2) Grant Aid scheme
3) Exchanges of Notes (E/N) concluded between the two countries
4) Grant Agreement (G/A) concluded between JICA and the government of Cambodia.

On the basis of the above-mentioned, the outline of the content of the execution design and the procurement supervision, responsibilities and points to be noted are described below.

(2) Content of the work

After the conclusion of the E/N and G/A, the consultant will conclude a consultancy agreement with the implementing agency of this project within the scope of works described in the E/N and G/A. The work of the consultant is summarized as follows:

1) Execution design

Final confirmation of the content of the project and preparation of and consultation on tender documents

Acquisition of approval for the tender documents by the Cambodian side

Public announcement of the opening of the tender and distribution of the tender documents

Assistance in implementation of the tender and evaluation and reporting of the tender results

Facilitation for conclusion of procurement agreements

2) Supervision of procurement of equipment

Verification of the specifications for manufacture of the equipment

Confirmation of the progress of procurement

Attendance at pre-shipment inspection and confirmation of pre-loading inspection

Confirmation of the adjustment and trial run of the equipment

Confirmation of the implementation of introductory operation guidance on the equipment

Confirmation of acceptance test and handover

(3) Supervisor Assignment Plan

1) With regard to the manufacture of the equipment to be procured, the consultant will dispatch one inspector for confirmation of the manufacturing standards and attendance at the pre-shipment inspection and the pre-loading inspection to confirm the absence of any changes in the specifications and quantities which were clearly established at the stage of the basic design survey.

2) After the delivery of the equipment to the project site, the consultant will dispatch a full-time supervisor to the project site and the supervisor will supervise the series of work consisting of unpacking, installation, adjustment, trial run, introductory operation guidance, acceptance test and handover.

3) The supervisors will be selected based on ample experience, appropriate technical decision-making capacity and coordination skills as the criteria.

2-2-3-5 Quality Control Plan

The following inspections will be implemented at the respective stages of the procurement of the equipment for the purpose of verifying the conformity of the equipment to the technical specifications provided in the agreement.

Pre-shipment inspection	To verify whether the specifications, performance and quantities of the manufactured equipment conform to the Technical Specifications (Implementation: supplier, Verification: consultant)
Pre-loading inspection	Comparison between the content of the technical specifications and the bill of lading and between the bill of lading and the equipment (Implementation: Inspection specialist, Verification: consultant)
Pre-delivery inspection	Confirmation of conformity of the equipment after delivery to the content of the technical specifications (Implementation: supplier, Verification: consultant)

3-2-3-6 Procurement Plan

(1) Procurement Sources

1) Procurement from Japan

Of the equipment to be procured in this project, Brush cutters, vehicles (excluding those station wagons which are not manufactured in Japan), tents, VHF handheld transceivers, generators, spare parts for Brush cutters and spare

parts for vehicles (excluding those parts which are not manufactured in Japan) will be procured from Japan.

2) Local Procurement

Portable GPS receivers will be procured locally because they are available on the local market. Ample supply of spare parts and adequate repair and maintenance services for the receivers are also available locally.

3) Procurement from Third Countries

Almost all the mine/metal detectors and deep search detectors currently used by CMAC are manufactured in Australia, Italy and Germany. Since mine/metal detectors and deep search detectors are used at the forefront of demining, deminers' familiarity with them is an important safety factor. Replacing equipment with identical equipment models is efficient in view of maintenance, such as repair, of the equipment. For these reasons, mine/metal detectors and deep search detectors will be procured from third countries. In addition, because some of the spare parts for vehicles are not manufactured in Japan, such parts will be procured from a third country (Thailand).

The descriptions in Sections 1) through 3) are summarized in Table 2-7.

Table 2-7 Sources of the equipment

Name of material and equipment	Source of procurement			Remarks
	Local	Japan	Third country	
Brush cutters		●		
Pickup trucks		●	●	Japan or Thailand
Station wagons		●		
Mine detectors			●	Australia
Mine/UXO detectors			●	Australia
Deep search detectors			●	Germany
Tents (size: 6.0 m × 10.0 m)		●		
Tents (size: 3.5 m × 7.0 m)		●		
Portable GPS receivers	●			
VHF handheld transceivers		●		
Generators (3 kVA)		●		
Spare parts for Brush cutters		●		
Spare parts for vehicles		●	●	Partially from Thailand
Spare parts for mine detectors		●		
Microbuses (12 seater)		●		

(2) Spare parts

1) Brush cutters

In order to improve the operating efficiency of the Brush cutters, spare parts for the rotary cutters and suspension systems which are likely to suffer severe abrasion and damage will be procured, in addition to filters required for regular maintenance.

2) Vehicles

Parts to be replaced at regular intervals, such as filters, for vehicles which will be driven 30,000 km or for two years and spare parts for the suspension, brake and electric systems which are likely to be damaged by driving on bad roads will be procured.

3) Detectors

Detectors suffer severe damage because of their use in harsh conditions. From actual experience on the ground, parts which break down frequently will be identified. The identified parts will be procured as spare parts in order to improve the efficiency of mine detection with the procured equipment.

4) VHF handheld transceivers

Since the custom-made rechargeable batteries are used, spare batteries will be procured against degradation of the batteries in the VHF handheld transceivers.

5) Generators

Filters required for regular maintenance will be procured as spare parts.

6) Tents

Long exposure to harsh conditions of high temperature and high humidity is expected to degrade and damage the cloth material of the tents. In order to repair the damaged parts, repair kits will be procured as spare parts.

(3) Transport route

Products from Japan to be procured in this project will be transported from ports of loading in Japan to the Port of Sihanouk Ville via the South China Sea. Products from Australia will be transported from a port of loading in Australia to the Port of Sihanouk Ville via the Pacific Ocean and products from the EU will be transported through the Indian Ocean to the Port of Sihanouk Ville. These products will be unloaded at the Port of Sihanouk Ville, transported overland to the training centre in Kampong Chhnang and handed over to the Cambodian side there. Products from Thailand will also be handed over at the training centre in Kampong Chhnang, after being transported via Poipet. It will take three weeks to transport products from the

ports of loading in Japan and Australia to the training centre and five weeks to transport products from the EU to the training centre.

2-2-3-7 Operation Guidance Plan

The procurement of equipment in this project is, in principle, for replacement of old equipment. Although CMAC already owns and uses the same equipment as that to be procured, engineers from the manufacturers of equipment that requires assembly at the site and equipment which, if wrongly operated, could cause loss of human life, or more precisely, four types of equipment, i.e. Brush cutters, mine detectors, mine/metal detectors and deep search detectors, will make the adjustments, run trials and provide introductory operation guidance on the equipment for the purpose of improving the operation and handling skills and maintenance capacity when the said equipment is delivered to the training centre in Kampong Chhnang. The consultant will supervise the guidance provided by the engineers or local agents of the manufacturers of the procured equipment. The number of days required for installation is shown in Table 2-8.

Table 2-8 Number of days required for installation and related works

No.	Name of equipment	Quantity	Unpacking/ Delivery (person·day)	Adjustment/ Trial (person·day)	Introductory operation guidance (person·day)	Total (total number of days)
			Local workers	Dispatched engineers		
1	Brush cutter	8	Included in Adjustment/ Trial	30 days×2 persons	Included in Adjustment/ Trial	30 days
2	Mine detector MINELAB F3S	221	5 days×4 persons	3 days×1 persons	8 days×1 persons	16 days
3	Mine/UXO detector MINELAB F3S	184	4 days×4 persons	3 days×1 persons	7 days×1 persons	14 days
4	Deep search detector EBINGER UPEX 740M	87	7 days×2 persons	7 days×1 persons	10 days×1 persons	24 days
Total (total number of days)			18 days	43 days	25 days	84 days

2-2-3-8 Soft Component (Technical Assistance) Plan

N/A

2-2-3-9 Implementation Schedule

Figure 2-5 shows the outline of the implementation process of this project based on the Grant Aid scheme of the Government of Japan.

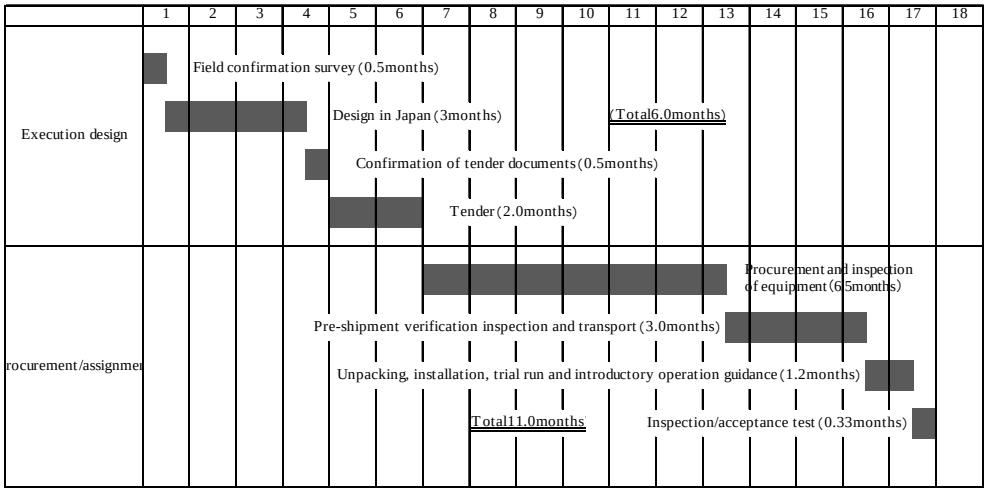


Figure 2-5 Project implementation process

2-3 Obligations of the Recipient Country

If this project is to be implemented as a Japanese Grant Aid project, the scope of the works of the Cambodian side will be as follows;

(1) Payment of commissions to the Japanese bank in accordance with the Banking Agreement (B/A)
(2) Completion of the procedures required for exemption from customs and import duties and other tax exemptions of equipment procured for this project at the Port of Sihanoukville and Poipet before the importation, and assistance for prompt transport of the imported equipment to the training centre in Kampong Chhnang
(3) Assistance for the Japanese nationals involved in this project on entry to Cambodia and during their stay in Cambodia to perform their duties in this project
(4) Completion of the necessary arrangements to exempt the Japanese nationals providing goods or services in this project from paying customs duties, domestic taxes or other levies
(5) Effective operation and appropriate maintenance of the equipment to be procured in this project
(6) Payment of all expenses required for implementation of the portion of this project which is not in the scope of the works of Japanese Grant Aid

2-4 Project Operation Plan

The equipment to be procured will be directly managed by the Headquarters of CMAC and assigned to each demining platoon in accordance with the Demining Implementation Schedule.

The operation and maintenance costs of the major pieces of equipment to be procured in this project, *i.e.* brush cutters, pickup trucks, station wagons and detectors, account for a large proportion of the entire operation and maintenance costs. However, as this equipment is, in principle, to replace the existing equipment, it will be possible to remove parts from the old dilapidated equipment, especially the brush cutters and detectors, and use them as spare parts. In addition, procurement of spare parts for maintenance and repairs which are required for operation and maintenance of the existing equipment is included in the project plan. For these reasons, the implementation of this project is expected to reduce the quantity of spare parts for operation, maintenance and repairs to be procured by CMAC and, consequently, realize a reduction in operation and maintenance costs.

Since the Japanese technical assistance project which was implemented for two years has improved the management of spare parts including inventory management, no problems are found in the management of the spare parts to be procured in this project. Table 3-9 shows the breakdown of CMAC's expenditure in recent years. Operation and maintenance costs

account for 6% to 11% of the total expenditure of CMAC. Since the major pieces of the equipment to be procured in this project are replacements for old dilapidated equipment whose operation and maintenance costs are high and equipment and spare parts for operation and maintenance, no problems are found in the operation and maintenance of the equipment.

In terms of maintenance and servicing of the equipment, because the equipment to be procured is a replacement for or addition to existing equipment, CMAC mechanics can apply the technologies they have acquired so far directly to the procured equipment. Therefore, from a technical perspective, trouble-free operation of the equipment can be expected. Table 2-9 shows the equipment operation and management costs in past years.

Table 2-9 Operation and management costs of equipment (Unit: US$)

		2005	2006	2007	2008	2009
Total Expenditure = (B) + (C) + (D) +(E)	(A)	10,428,538	11,078,479	10,542,025	10,228,555	12,426,485
Maintenance materials procurement costs	(B)	132,243	625,820	414,799	391,344	209,767
Consumable materials procurement costs	(C)	976,969	990,337	1,149,857	664,985	1,390,984
Operation and maintenance costs of the equipment	(D)	683,403	736,649	1,207,727	1,030,416	1,029,816
Miscellaneous	(E)	8,635,923	8,725,673	7,769,642	8,141,810	9,795,918
Ratio of operation and maintenance costs of the equipment to entire expenditure (%) (F) (F) = (D) / (A) ×100		6.6	6.6	11.5	10.1	8.3

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The total project costs required for the implementation of this project are estimated at 1,298 billion yen. The following table shows the breakdown of the costs to be borne by both the Japanese and Cambodian sides based on the scope of works, according to the estimation conditions shown in 2-5-1-3 below. However, this figure does not show the Amount of Grant in the E/N.

2-5-1-1 Costs to be borne by the Cambodian side

Table 2-10 shows the costs to be borne by the Cambodian side.

Table 2-10 Costs to be borne by the recipient country

Item	Amount (US$)
Bank commissions	3,780 (approx. 0.3 million yen)
Total	3,780 (approx. 0.3 million yen)

2-5-1-2 Estimation conditions

1) Time of estimation: November, 2010

2) Exchange rate: US$ 1 = 88.00 Japanese yen

3) Procurement period: Procurement period of equipment is as shown in the Project implementation process (Figure 2-5)

4) Others: The estimation shall be carried out in accordance with the Japanese Grant Aid scheme.

2-5-2 Operation and Maintenance Costs

The major pieces of equipment requiring operation and maintenance expenses after introduction are the brush cutters, motor vehicles and detectors. Operation and maintenance expenses are paid by the donor agencies in each project and not from CMAC's own budget. Since the assistance currently being provided by other donors is expected to continue, no problems in the operation of the equipment are expected.

2-5-2-1 Maintenance Costs (detectors)

The operation and maintenance expenses of the newly procured detectors required for the implementation of this demining project are estimated at US$ 202,710 (approx. 17.8 million yen) per year for maintenance and repairs. Since the procurement of detectors to replace the existing detectors in this project will lead to a lower failure rate, there will be no increase in the maintenance expenses. Table 2-11 shows an estimate of the maintenance and repair costs of each type of detector.

Table 2-11 Estimate of maintenance and repair costs (detectors)

Unit: US$

No	Name of equipment	Model	Quantity (note)	Ratio of maintenance and repair costs (/each/year)	Maintenance and repair costs (US$/each/year)	Annual maintenance and repair costs (US$/year /all detectors
1	Mine detector	Minelab F3S	221	0.05	320	70,720
2	Mine/metal detector	Minelab F3S	184	0.05	410	75,440
3	Deep search detector	Ebinger UPEX 740M	87	0.05	650	56,550
Total						202,710

Note: "Quantity" is the number of new detectors to be procured

Estimation conditions:

a. Ratio of maintenance and repair costs of the equipment:
   Estimated at approx. 5% based on past experience
b. Maintenance and repair costs of the equipment:
   (Estimated price of the equipment) x (ratio of maintenance and repair costs)
c. Ratio of the spare parts costs to the maintenance and repair costs:
   Labor costs are not included in the estimation because repair work will be carried out at CMAC's workshop.

Total maintenance and repair costs per year of the equipment (detectors):
US$ 202.7 thousand = approx. 17.8 million yen

2-5-2-2 Operation and Maintenance Costs (vehicles and brush cutters)

The operation and maintenance costs of the newly procured vehicles and brush cutters required for the implementation of this demining project are estimated at US$ 0.450 million (approx. 27.0 + 12.6 = 39.6 million yen). Since the procurement of vehicles and brush cutters to replace the existing equipment in this project will lead to a lower failure rate, there will be no increase in the maintenance expenses. Tables 2-12 and 2-13 show the estimates of the fuel and lubricant costs and maintenance and repair costs, respectively.

(1) Fuel and lubricant costs

Table 2-12 Estimate of fuel costs

Unit: ℓ

No.	Name of equipment	Specifications (kw)	Quantity	Fuel consumption per piece per day (ltr/day/each)	Fuel consumption (ltr/day/all equipment)
1	Brush cutter	74	8	0.175× 74 kw×5.85 h = 75.8	606
2	Pick-up truck and station wagon	80	108	0.020× 80 kw×4.00 h = 6.40	691
3	Microbus	110	7	0.030×110 kw×4.00 h = 13.2	92.4
Total		-			1,389

Estimation conditions

a. Working days per year: 240 days
b. Working hours per day: 9 hours with efficiency of 65% (brush cutters) and 4 hours (motor vehicles)
c. Fuel consumption per hour of operation (ℓ/kw-h):
In accordance with the standards provided in ”Construction Machinery Rental Calculation Table, 2011 edition,” Japan Construction Mechanization Association, lubricant costs are estimated assuming consumption of lubricant at 1% of fuel consumption.
d. Price of diesel fuel: 0.9US$/ℓ
Price of lubricant: 1.9 US$//ℓ
e. Fuel costs per year: 1,389 ℓ × 240 days × US$ 0.9 ≒ US$ 300,000 (= 26.4 million yen)
Lubricant costs per year: 13.9ℓ ×240 days × US$ 1.9 ≒ US$ 6,350 (= 0.6 million yen)

Total fuel and lubricant costs per year: 26.4 + 0.6 = 27.0 million yen

(2) Maintenance and repair costs

Table 2-13 Estimate of maintenance and repair costs

No.	Name of equipment	Specifications (kw)	Quantity	Ratio of maintenance and repair costs (/each/year)	Maintenance and repair costs per piece per year (thousand yen/each/year)	Annual maintenance and repair costs (thousand yen/year/all equipment)
1	Brush cutter	74	8	0.40 ÷ 9.0 years × 1/2 = 0.022	836	6,688
2	Pickup truck and station wagon	80	108	0.45 ÷ 12 years × 1/2 = 0.019	52	5,616
3	Microbus	110	7	0.45 ÷ 12 years × 1/2 = 0.019	44	308
Total		-	-	-	-	12,612

Estimation conditions

a. Ratio of maintenance and repair costs and lifetime of the equipment:

In accordance with the standards provided in ”Construction Machinery Rental Calculation Table, 2011 edition,” Japan Construction Mechanization Association

b. Maintenance and repair costs of the equipment per piece:
(Estimated price of the equipment (CIF price/each)) x (ratio of maintenance and repair costs)

c. Ratio of the spare parts expenses to the maintenance and repair costs
The ratio of labor costs is 50:50. However, as maintenance and repairs are carried out at CMAC’s own workshop, labor costs are not included in the estimate. Only spare parts costs are included.

d. Maintenance and repair costs per year:
(Maintenance and repair costs per piece per year) x (quantity of equipment)

Total maintenance and repair costs per year of the equipment: 12.6 million yen

The existing pieces of equipment are in dilapidated condition due to aging. Therefore, they are fuel-inefficient and incur high repair costs. However, since it is expected that unrepairable equipment will be reused as a source of spare parts following procurement of the new equipment, the number of old dilapidated pieces of equipment will be reduced. Therefore, it seems very likely that the equipment can be operated and managed with a budget at a similar level to the actual CMAC budget in recent years.

2-6 Other Relevant Issues

The Cambodian side will be responsible for transporting procured equipment from the place of the handover to each demining site at which it is actually used in accordance with the implementation plan. Therefore, the Japanese side will have to maintain close communication with CMAC on days of the handover so as not for delay in handover of equipment to affect the progress of the project.

Chapter 3 Project Evaluation

Chapter 3 Project Evaluation

3-1 Recomendations

3-1-1 Preconditions for the project implementation

The equipment to be procured in this project will be handed over to the Cambodian side at the Training Centre in Kampong Chhnang. Transport of the equipment to each demining site by CMAC is a precondition for the project implementation. Another precondition is continuation of the maintenance of the equipment and the training and management of operators of the equipment and deminers by CMAC.

3-1-2 Preconditions and important assumptions for the achievement of the overall goal of the project

One of the preconditions is guarantee of budget required for operation and maintenance of the equipment to be provided in this project. Fulfillment of the obligations of the Ottawa Treaty by the deadline requires an increase in the budgetary appropriation from the Royal Government of Cambodia and continuation of financial assistance from other donors to the project activities. Additionally, the digital equipment such as computers, plotters, and printers included in the request made by Cambodian side were excluded from this project because such equipment was supplied in technical assistance in 2008 through 2010 and no major problem will be encountered without additional equipment in the demining activities for the time being. However, the prerequisite for this exclusion is that the renewal of this equipment shall be examined in the future for the sake of the achievement of the overall project plan because the existing equipment will be superannuated in several years and there is concern that the accumulated data will be lost in the worst case.

3-2 Project Evaluation

3-2-1 Relevance

This project is to be implemented in one of the priority areas of the national development plan of the Kingdom of Cambodia. It is compliant with the ODA policy of the Government of Japan. Implementation of this project is urgently required for achievement of the target of the landmine and UXO clearance of Cambodia and responds to the needs for landmine and UXO clearance. Since the equipment to be procured is for replacement and reinforcement of the equipment owned, it is considered to be possible to operate and maintain the equipment with the personnel and technologies of CMAC. For these reasons, relevance of this project is considered high.

3-2-2 Effectiveness

(1) Quantitative effects

The area of land cleared of landmines and UXOs by CMAC will increase as a quantitative effect. Table 3-1 shows concrete numerical values regarding the effectiveness of the project (Quantitative effects).

Table 3-1 Effectiveness of the project (Quantitative effects)

Verifiable indicator	Current figure (2009)	Target figure (2014)
Area cleared of landmines (km^2) (cumulative)	263.0	452.1
Area of land which becomes available for use after a technical survey (km^2) (cumulative)	0.0 (to begin in 2010)	719.4

(2) Qualitative effects

① The implementation of the project will improve efficiency of manual demining activities by making it easy to maintain performance of the equipment and improving the workplace safety of deminers with replacement of old and dilapidated equipment with new one.

② Demining and a technical survey will contribute to the release of land unusable in the past for productive use.

③ Reduction in the area of land contaminated with landmines will contribute to the guarantee of the safety of people's life.

Chapter 4 Annexes

Chapter 4 Annexes

Annex I Members of the Survey Teams

(1) Preparatory Survey Team

Name	Area of responsibility	Affiliation
Nobuaki MIYATA	Supervision	Visiting Senior Advisor, JICA
Eri KOMUKAI	Peace building	Senior Advisor, JICA
Tomoko SHIMADA	Project management	Public Policy Department, JICA
Yukio KOHSAKA	Project coordination/Operation Plan	INGEROSEC Corporation
Kazuhiko KAMACHI	Equipment Plan 1/Procurement Plan 1/ Estimation 1	INGEROSEC Corporation
Nobuyuki KAMIHASHI	Equipment Plan 2/Procurement Plan 2/ Estimation 2	INGEROSEC Corporation

(2) Explanation of Draft Outline Report Team

Name	Area of responsibility	Affiliation
Nobuaki MIYATA	Supervision	Visiting Senior Advisor, JICA
Yukio KOHSAKA	Project coordination/Operation Plan	INGEROSEC Corporation
Kazuhiko KAMACHI	Equipment Plan 1/Procurement Plan 1/ Estimation 1	INGEROSEC Corporation
Nobuyuki KAMIHASHI	Equipment Plan 2/Procurement Plan 2/ Estimation 2	INGEROSEC Corporation

Annex II Study Schedule

(1) Preparatory survey team

Date			JICA		Consultant(ingerosec)			Stay
			Peace Building	1 2 Leader , Administrate	3. Cheaf (Yukio KOSAKA)	4. Equipment Planner1/Procurement planner1/Cost Estimator1 (Kazuhiko KAMACHI)	4. Equipment Planner-2/Procurement planner2/Cost Estimator2 (Nobuyuki KAMIHASHI)	
1	20-Oct	Wed			Narita(10:00TG643)→Bangkok(14:30) Bangkok(18:10TG584)→Phnom Penh(19:25)(by Air)			Phnom Penh
2	21-Oct	Thu			Courtesy Call EOJ, JICA,CMAC Explanation of Inseption Rep.			Ditto
3	22-Oct	Fri			Conference with CMAC regarding Questioneer and Schedule			Ditto
4	23-Oct	Sat			Inner Meeting			Ditto
5	24-Oct	Sun			Inner Meeting			Ditto
6	25-Oct	Mon			Conference with CMAC HQ and Deprtments			Ditto
7	26-Oct	Tue			Conference with CMAC HQ and Deprtments			Ditto
8	27-Oct	Wed		Narita→Phnom Penh(by Air)	Conference with CMAC Reserch and Development Dep.			Ditto
9	28-Oct	Thu		Courtecy Call EOJ, JICA, CMAC				Ditto
10	29-Oct	Fri		(National Holiday) Phnom Penh → Compong Chunang, Survay of T/C → Battambang				Battambang
11	30-Oct	Sat		DU2 Site, Peace Build. Site, Central Workshop, DU2 Office				Ditto
12	31-Oct	Sun		(National Holiday) Battambang to Phnom Penh				Phnom Penh
13	1-Nov	Mon	Narita→Phnom Penh(by Air)	(Substitute holiday) Inner Meeting				Ditto
14	2-Nov	Tue	Move from Phnom Penh to Campong Cham, Visit ERO (DU5) Office and Site					Compong Cham
15	3-Nov	Wed	Move from Caompong Cham to Phnom Penh, Conference with CMAC					Phnom Penh
16	4-Nov	Thu	Conference with CMAC on M/D , Visit CMAA, Other Donner. Survay of Private Sector concerning the maintenance of the equipment					Ditto
17	5-Nov	Fri	Final Conference with CMAC about M/D (Sign on it)、Final Report to EOJ and JICA Phnom Penh→(by Air)		Final Conference with CMAC about M/D (Sign on it)、Final Report to EOJ and JICA			Ditto
18	6-Nov	Sat	Come back to Narita		Inner Meeting		Narita(10:45TG641)→Bangkok(15:45),Bangkok(18:25TG584)→Phnom Penh(19:40)(by Air), Inner Meeting	Ditto
19	7-Nov	Sun			Inner Meeting			Ditto
20	8-Nov	Mon			Survay of private sectors in Phnom Penh			Ditto
21	9-Nov	Tue			(National Holiday) From Phnom Penh to Battambang Inner Meeting			Battambang
22	10-Nov	Wed			Investigation of C/W and maintenance system (before noon), Move to Banteay Meanchey an Visit DU1 Office and Site			Banteay Meanchey
23	11-Nov	Thu			Move to Siem Reap and Visit DU4 Office and Site			Siem Reap
24	12-Nov	Fri			Survay of DU4 Site, Visit DU6 Office and Site			Ditto
25	13-Nov	Sat			Inner Meeting			Ditto
26	14-Nov	Sun			From Siem Reap to Phnom Penh			Phnom Penh
27	15-Nov	Mon			From Phnom Penh to Sihanoukville and go back to Phnom Penh after checking condition of Port			Ditto
28	16-Nov	Tue			Conference with CMAC	Survay of Private Workshop and Spare Parts		Ditto
29	17-Nov	Wed			Conference with CMAC regarding questioneer etc.	Conference with CMAC regarding questioneer etc.、Survayn of Private Workshop and Spare Parts		Ditto
30	18-Nov	Thu			Conference with CMAC (Technical Memo, etc.) and sign on it, Followup questioneer and investigation	Conference with CMAC (Technical Memo, etc.) and sign on it, Followup questioneer and investigation		Ditto
31	19-Nov	Fri			Final Report to EOJ and JICA Office Phnom Penh(20:40TG584)→Bangkok(21:45)Bangkok(23:50TG642)→(by Air)			on Airplane
32	20-Nov	Sat			(National Holiday) Narita(07:30)			

(2) Explanation of draft outline report team

Date			(JICA)	Consultant			Stay
			1 Leader Nobuaki MIYATA	2 Yukio KOHSAKA	3 Kazuhiko KAMACHI	4 Nobuyuki KAMIHASHI	
1	Feb.13	日	11:30 Haneda→16:30 Bangkok 18:25 Bangkok→19:40 Phnom Penh(TG584)	Departure Haneda(00:20TG661)→Bangkok(05:20) Bangkok(07:45TG580)→Phnom Penh(09:00)			Phnom Penh Hotel
2	Feb.14	月	8:30-9:30 JICA Cambodia Office (CR, SRO, Ms.Kamei) 2:30 CMAC, Explanation of Draft Report				Ditto
3	Feb.15	火	10:00-11:00 Embassy of Japan 2:30 CMAC Discussion on M/D、Confirmation of specification				Ditto
4	Feb.16	水	AM Signing on M/D (TBC) 4:00-5:00 Report to JICA Cambodia Office				Ditto
5	Feb.17	木	10:00 Departure Phnom Penh(TG581)→Bangkok(11:05)、Bangkok(14:50 TG660→Haneda(22:30)	Further discussion with CMAC on details of specification			Ditto
6	Feb.18	金		Documentation 20:40 Departure(TG585)->Bangkok(21:45) Bangkok(23:50 TG642)→			
7	Feb.19	土		7:30 Arrival at Narita			

Annex III List of Parties Concerned in the Recipient Country

(1) The Embassy of Japan in Cambodia

Masafumi KUROKI Ambassador Extraordinary and Plenipotentiary
Hiroshi KAWAMURA Minister
Hideaki MATSUO First Secretary
Yasuhide SUGIYAMA Second Secretary

(2) JICA Cambodia Office

Yasujiro SUZUKI Chief Representative
Yukiharu KOBAYASHI Senior Representative
Naoko KAMEI Representative
Satoru YAMADA Project Formulation Adviser
PICH THYDA Program Officer

(3) The Royal Government of Cambodia

Name	Area of responsibility	Affiliation
HENG RATANA	Director General,CMAC	CMAC HQ
OUM PHUMRO	Deputy Director General	CMAC HQ
EK BOLIN	Director of Support and Human Resource	CMAC HQ
MOM SIMETTHA	Procurement Officer	CMAC HQ
HENG KRA	Deputy Director of Support & HR	CMAC HQ
MONG SOKUNTHEARATH	Training Centre Manager	CMAC Training Centre
SA EM PONNAREAY	Manager	DU 1
SEAM HAK	Deputy Demining Unit 1 Manager	DU 1
PRING PANHARITH	Manager	DU 2
RATH POTTANA	Manager	DU 4
KEO SARATH	Manager	DU 5
MEAN SARUN	Manager	DU 6
PRUM SOPHAKMONKOL	Deputy Secretary General	CMAA
CHUM BUN RONG	Advisor to the Prime Minister Secretary General	CMAA
EANG KAMRANG	Database Unit Manager	CMAA
KRY THONG	Chief of Intervention Unit Public Works	Ministry of Public Works and Transport Heavy Equipment Center

(4) Other organizations

Name	Area of responsibility	Affiliation
WAYNE TURNBULL	Major, U.S. Army Chief, Office of Defense Cooperation	Embassy of the United States
LOU LUFF	Quality Assurance Technical Adviser	UNDP
MELISSA SABATIER	Project Manager	UNDP
TAKAGI Shigeru	Chief of Technical Advisor Project Leader	JMAS Sub Office Battambang Province
IMAI YOHEI	Assistant Technical Adviser/ Civil-engineering Adviser	JMAS Sub Office Battambang Province
WATANABE EIKI	Resident Representative	JMAS Phnom Penh Office
SATO YOSHIKO	Administrator	JMAS Phnom Penh Office
ARAI TOMOE	Chief of Finance	JMAS Phnom Penh Office
MINAMI KYOKO	Training Management Advisor/Project Coordinator	
JAMIE FRANKLIN	Country Program Manager	MAG
MICHAEL BARTURA		HALO TRUST
MASAHIRO YASUDA	OFFICE OF SPECIAL PROJECT MANAGEMENT SECOND MANAGEMENT DEPARTMENT	JICS
FINN VIGGO GUNDERSEN	General Manager	ENVO TECH
UY SOVUTHY	Assistant Manager	ENVO TECH
JAY STEED	Task Order Project Manager	Dyn Corp
JIMMI C. VICTORIA	General Manager	Sideband Communication & Engineering Service(Minelab)
FUKUDA SHINGO	Chief Representative	TOYOTA TSUSHO CORPORATION
SEAK SOTEAR	Sale Manager	MITSU CAMBODIA Co.,Ltd. (MITSUBISHI MOTORS)
SUPONG LOGULPRAKIT	Executive Manager	MITSU CAMBODIA Co.,Ltd. (MITSUBISHI MOTORS)
TOUM PHARY	Sales	MITSU CAMBODIA Co.,Ltd. (MITSUBISHI MOTORS)
OUK CHANTHA	MANAGER	TRANSINDO
LUN VUTHY	Operation MANAGER	TRANSINDO
HENRY EANG	General Manager	KTM Co.,Ltd(KOMATSU)
BUN SOPHAL	Assistant to General Manager	KTM Co.,Ltd(KOMATSU)
SOM SANGKHAR	Managing Director	S.O.M CORPORATION,LTD

Annex IV-i Minutes of Discussions (M/D)on the field survey

Minutes of Discussions
on Preparatory Survey on the Project for
Improvement of Equipment for Demining Activities (Phase VI)
in the Kingdom of Cambodia

In response to a request from the Royal Government of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Improvement of Equipment for Demining Activities (Phase VI) (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 Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Nobuaki MIYATA, Senior Advisor, JICA, and is scheduled to stay in the country from October 20 to November 19, 2010.

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

As a result of 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 Preparatory Survey Report.

Phnom Penh, November 5, 2010

Mr. Nobuaki MIYATA
Leader
Preparatory Survey Team
Japan International Cooperation Agency

H.E. Heng RATANA
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 areas of the Demining Units (DUs) 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 discussions 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. The Cambodian side explained the necessity of equipment and requested to the Government of Japan to provide as many items on the list as possible.

4-3 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 the necessary measures, as described in Annex-5, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

6. Schedule of the Study

6-1 The Team will proceed to conduct further study in Cambodia until November 19th, 2010.

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 February 2011.

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

7. Other relevant issues

7-1 Both sides agreed that equipment plan should be formulated focusing on the following factors.

- Direct contribution to demining activities
- Maintaining and improving the efficiency of the present capacity of brush cutters

Although above two factors are mainly focused, maintaining and further improving CMAC's demining and mine action management capacity as a leading national demining institution can be considered.

7-2 Regarding information system equipment such as PCs, both sides agreed that not only replacement of PCs but also some upgrading of network and software should be considered. The Team explained that those items are not highly prioritized for Japanese Grant Aid this time from the view point of selection and concentration of input within limited financial resources.

7-3 Both sides agreed that items and the number of equipment should be limited to the extent to which CMAC can maintain the demining activities to achieve its strategic plan (2010-2014) . After the approval of the National Mine Action Strategy (2010-2019), CMAC will review and align its strategic plan with the overall national strategy.

7-4 The Team requested and the Cambodian side agreed that CMAC ensures the budget and human resources to maintain its activities.

7-5 The Team requested and the Cambodian side agreed that CMAC assures appropriate maintenance work including efficient utilization of the Central Workshop and the Mobile Workshop.

7-6 Both sides recognized that suspected areas of contamination seem to be almost same level as described in the National Mine Action Strategy (2010-2019) (in the process of approval), according to the results of the phase I of the Baseline Survey.

7-7 If the Project is approved by the Government of Japan, the Cambodian side requested that some equipment should be delivered by the time of the MSP (Meeting of States Parties) 2011 in Phnom Penh.

Annex-1 The map of the site
Annex-2 CMAC Organization Chart
Annex-3 Items Requested by Cambodia
Annex-4 Japan's Grant Aid Scheme
Annex-5 Major Undertakings to be taken by Each Government

Annex: A

CMAC CURRENT DEPLOYMENT MAP
For The Month of September 2010

OPS/PL/10

Demining Unit 6
MP#141,MP#142,MP#143,MP#144,
MP#145,MP#146,MP#147,MP#107,
TSC#07,TSC#18,TSC#20,CMC#13,
CMC#19,EOD#16,EOD#20,EOD#21
BC#25,BC#26,BC#23,BLS#07,
BLS#08,BLS#10,BLS#14,TSC#01,
TSC#02, 1 QA Team,1 TSS-BLS,
OFFICE STAFF

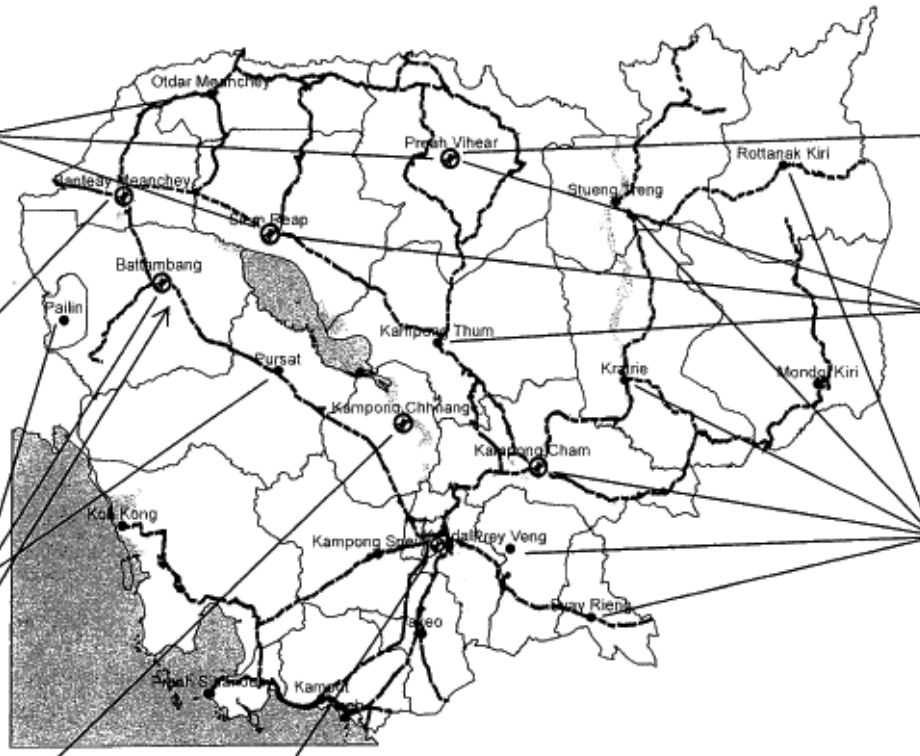
Demining Unit 1
MP#125,MP#130,MP#140
LLD#01,LLD#03,SLD#03,SLD#01,
SLD#06,SLD#11,EOD#25,BC#14,
BC#11,BC#03,BC#15,CMC#09,
CMC#06,CMC#03,CMC#08,TSC#08,
TSC#09,MRE#01,BLS#01,BLS#02
BLS#04,BLS#06,BLS#09,BLS#13
BLS#15,BLS#16, 6 BLS MGT.
7 DFP-CBMRR,OFFICE STAFF

Demining Unit 2
MP#102,MP#109,MP#127,MP#135,
MP#119,MP#112,MP#129,CMC#16,
DM#01,DM#02,DM#03,DM#04,
SLD#07,SLD#02,SLD#10,LLD#02,
LLD#04,EOD#02,EOD#26,EOD#04,
MRE#02,CBD#01,CBD#04,CBD#05,
BC#19,BC#22,BC#12,BC#17,BC#27,
BC#09,BULLDOZER,EXCAVACTOR,
17 DFP-CBMRR,OFFICE STAFF

Demining Unit 3
MP#110,MP#111,MP#120,MP#137
CBAT#01,BLS#03,EOD#12,EOD#05
BAT#01,BAT#02,BAV#01,SLD#04
OFFICE STAFF.

Demining Unit 4
MP#128,MP#101,MP#124,
BLS#11,BLS#12,SLD#08,MRE#06
EOD#14,EOD#10,BC#08,BC#13,
BC#06,BC#16,BC#24,CMC#15
11 DFP-CBMRR,OFFICE STAFF
6-ALIS

Demining Unit 5
TSC#11,BLS#05MP#122,MP#118,
ERI#24,ERI#22,ERI#23,BAV#02,
BAV#03,BAV#04,BAV#05,BAV#06,
ERC#10,ERC#20,ERC#21,MRE#05,
BAT#03,BAT#04,BC#07,EDD#01,
EDD#02,EDD#03,EOD#08,EOD#18,
EOD#19,MRE#04,EOD#28,BC#20,
23 DFP-CBURR,OFFICE STAFF.



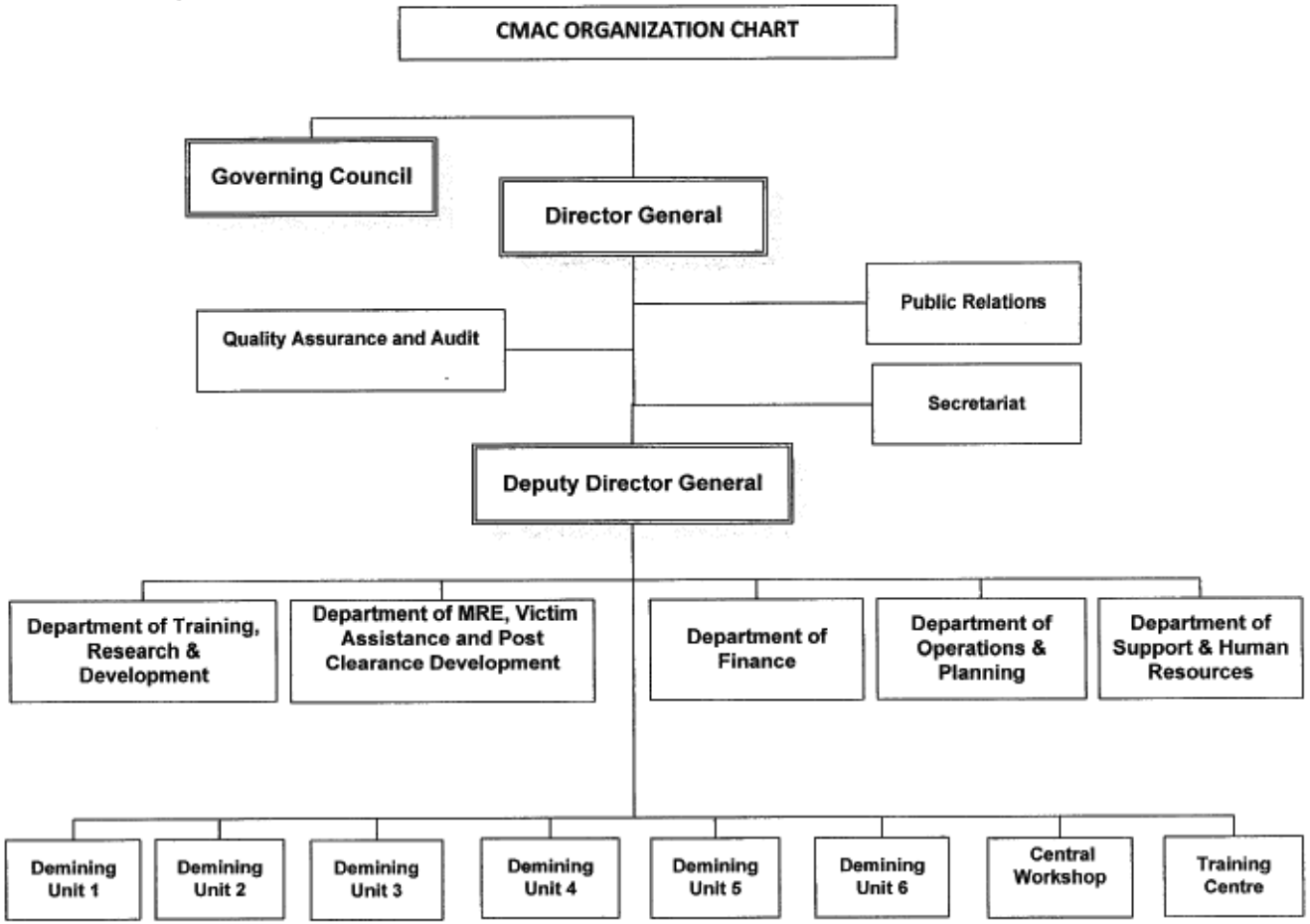
Battambang
-Central Workshop

Training Centre
OFFICE STAFF

Head Quarter
CMC#02,CMC#11,EOD#07,EOD#01,
EOD#03,EOD#06,EOD#13,EOD#17,
EOD#09,EOD#11,12 DFP-CBURR,
MRE#03,2 EOD SUPERVISOR,
OFFICE STAFF.

Kilometers
0 45 90 180
Dataum.....Indian Thialand 1960
Zone.....48 N
1:50000

Legend
- DU Base
- Khet Centre
- Maind Road
- River and Sea
- province Boundary



Approved by the Governing Council on 01 June 2009

Annex 3

LIST OF REQUESTED EQUIPMENT

This page is closed due to the confidentiality.

Annex-4

JAPAN'S GRANT AID

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

The Grant Aid is non-reimbursable fund to a recipient country 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

The Japanese Grant Aid is conducted as follows-

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

・Appraisal &Approval
-Appraisal by The GOJ and JICA, and Approval by the Japanese Cabinet

・Determination of Implementation
-The Notes exchanged between the GOJ and a recipient country

・Grant Agreement (hereinafter referred to as "the G/A")
-Agreement concluded between JICA and a recipient country

・Implementation -Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

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

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the

implementation of the Project.

- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

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

JICA requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of 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 Survey, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

The Report on the Survey is reviewed by JICA, and after the appropriateness of the Project is confirmed, JICA recommends the GOJ to appraise the implementation of the Project.

3. Japan's Grant Aid Scheme

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

After the Project is approved by the Cabinet of Japan, the E/N will be singed between the GOJ and the Government of the recipient country to make a plead for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

The consultant firm(s) used for the Survey Will be recommended by JICA to the recipient country to also work on the Project's implementation after the E/N and the G/A, in order to maintain technical consistency.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals". (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 recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

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

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

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

(7) "Export and Re-export"

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

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making

payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

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

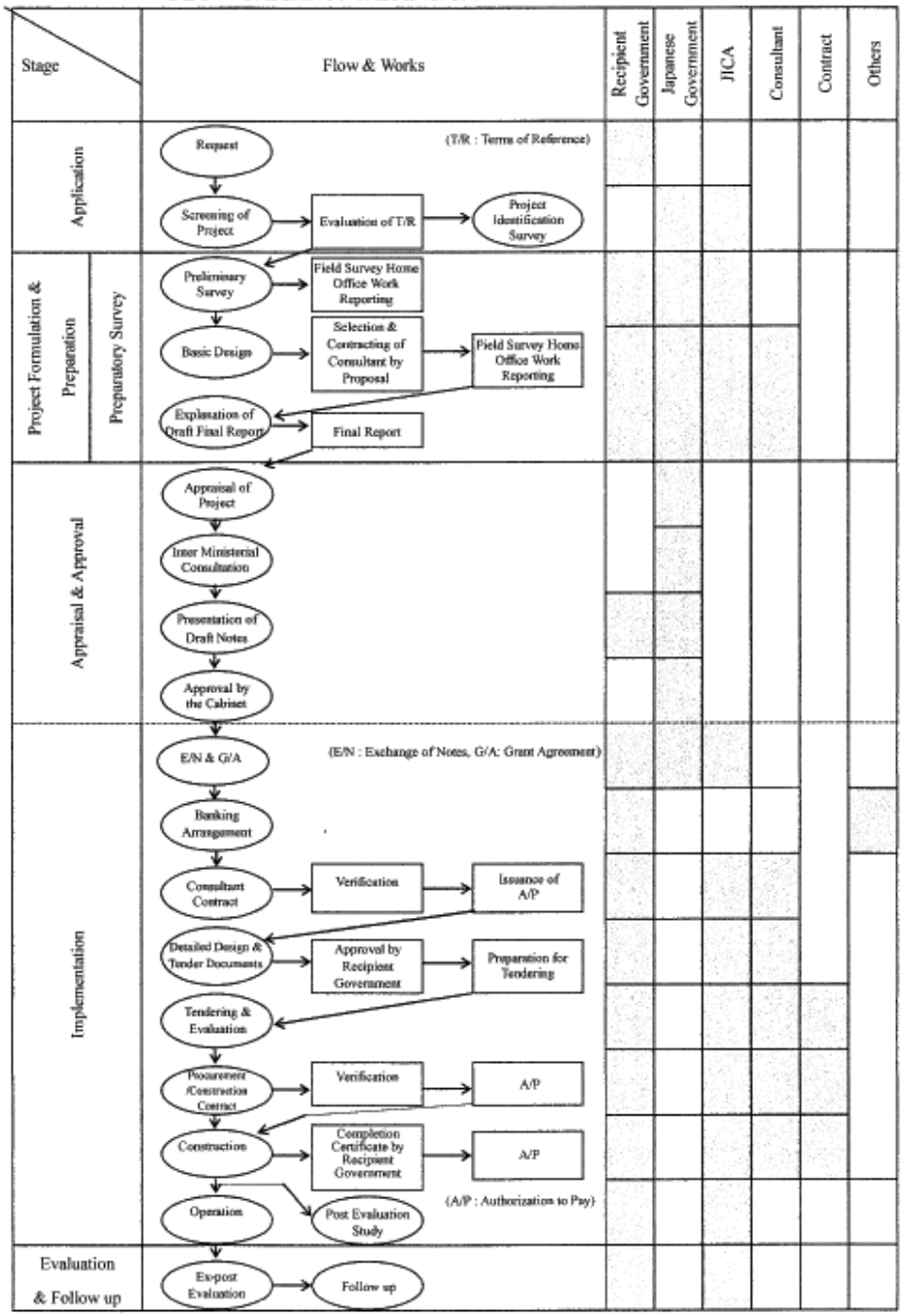
(10) Social and Environmental Considerations

A recipient country must ensure the social and environmental considerations for the Project and must follow the environmental regulation of the recipient country and JICA socio-environmental guidelines.

(End)

Attachment I

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



Major Undertakings to be taken by Each Government

NO	Items	To be covered by the Grant	To be covered by Recipient side
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project	(●)	(●)
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into 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 contract		●
5	To maintain and use properly and effectively the facilities constructed 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, N/A: Not Applicable)

Annex IV-ii Minutes of Discussion (M/D) on the Report of the Outline Explanation Team

Minutes of Discussions
on Preparatory Survey on the Project for
Improvement of Equipment for Demining Activities (Phase VI)
in the Kingdom of Cambodia
(Explanation of Draft Outline Report)

In October and November 2010, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team on the Project for Improvement of Equipment for Demining Activities (Phase VI) (hereinafter referred to as "the Project") to the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), and through discussions and field survey and examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult with the Cambodian side on the contents of the draft report, JICA sent to Cambodia the Explanation of Draft Outline Report Team (hereinafter referred to as "the Team"), which is headed by Mr. Nobuaki MIYATA, Senior Advisor, JICA, from February 13 to February 18, 2011.

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

Phnom Penh, February 16, 2011

Mr. Nobuaki MIYATA
Leader
Explanation of Draft Outline Report Team
Japan International Cooperation Agency

H.E. Heng RATANA
Director General,
Cambodian Mine Action Centre
Kingdom of Cambodia

ATTACHMENT

1. Components of the Draft Outline Report

The Cambodian side agreed and accepted in principle the contents of the draft outline report of the Preparatory Survey by the Team.

The list of equipments is attached to Annex-1.

The final decision will be made by the Government of Japan based on the further examination of the results of the Preparatory Survey.

The Team handed one copy of the draft final detailed specification 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.

2. Japan's Grant Aid Scheme

2-1 The Cambodian side understood the Japan's Grant Aid scheme explained by the Team.

2-2 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 the Cambodian side.

2-3 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, the Cambodian side is required to consult with the Embassy of Japan and JICA Cambodia office before it is disposed, transferred, or used for other purposes.

3. 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, 2011.

4. Other Relevant issues

The Cambodian side confirmed that the following undertakings should be taken by the Cambodian side at the Cambodian expenses.

4-1 To bear the following commissions to the Japanese bank for banking services based upon the B/A

(a) Advising commission of A/P

(b) Payment commission

4-2 To ensure unloading and customs clearance at port of disembarkation in Cambodia

4-3 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 Cambodia and stay therein for the performance of their work.

4-4 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

4-5 To maintain and use properly and effectively equipment provided under the Grant Aid

4-6 To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation and installation of the equipment.

Annex-1 List of Equipment

LIST OF EQUIPMENT

No	Equipment	Unit	Qty.	
			request	plan
1	Brush Cutter	Unit	12	8
2	Vehicles-Pick up4x4 heavy duty	Unit	50	50
3	Vehicles-Station Wagon 4x4, heavy duty	Unit	67	58
4	Mine detectors Minelab Г3S	Unit	191	221
5	Mine/UXO Detector Minelab F3S	Unit	183	184
6	Deep search detectors Ebinger UPEX 740M	Unit	113	87
7	Deminer tents-1 (size: 6mx10m)	Unit	12	32
8	Deminer tents-2 (size: 3.50mx7m)	Unit	60	54
9	Handheld GPS	Unit	234	117
10	VHF Handheld Radio	Unit	347	205
11	Generators (3KVA) Diesel	Unit	28	27
12	Spare Parts for B/C	Set	1	1
13	Spare Parts for Vehicles	Set	1	1
14	Spare Parts for Mine Detectors	Set	1	1
15	Van 12-Seats, diesel	Unit	7	7

Annex V List of reference materials and materials obtained

No.	Name of reference material
1	CMAC INTEGRATED WORK PLAN 2010
2	CMAC Five-Year Strategic Plan 2010-2014
3	CMAC Annual Report 2009
4	CMAC Annual Report 2008
5	CMAC Annual Report 2007
6	CMAC Annual Report 2006
7	CMAC Ten Years
8	INTEGRATED WORK PLAN 2010
9	Five-Year Strategic Plan 2010-2014
10	DU1 ORGANISATION CHART
11	DEMINING UNIT-2 ORGANIZATION CHART
12	CMAC DU6 CHART
13	JICA Equipment Provided to (DU1)
14	Brief Report from January up to October 2010 And the Goal for the Last Two Months in2010(Du6)
15	CMAC 67units of Station Wagon
16	Result of Demining Activities in Cambodia and CMAC
17	MAG Cambodia
18	MAG Annual Review 2008-2009
19	Garmin GPS map62s Spec sheet
20	The Phnom Penh Post on November 18, 2010, Articles on mine explosion accidents
21	The CAMBODIA DAILY on November 18, 2010, Articles on mine explosion accidents
	Encl. Electronic data
21	Name of Group or Team for Mine/UXO Clearance in CMAC（Number of Team）
22	Name of Group or Team for Mine/UXO Clearance in CMAC（Structure of Team）
23	Combination of Teams for Mine/UXO Clearance in CMAC
24	Donated equipment
25	Life Time of Equipment
26	Mine Detector Spare Part Used (2006-2009)
27	Name of Group or Team for Mine/UXO Clearance in CMAC
28	Tenth Meeting of the States Parties (10MSP)
29	REQUIREMENT EQUIPMENTS FOR MOBILE PLATOON(1 Land 1 Man Drill)
30	REQUIREMENT EQUIPMENTS FOR MOBILE PLATOON(1 Land 2 Man Drill)