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CAMBODIAN MINE ACTION CENTRE

# Annual Report 2006



Linking mine action and development: Minefield cleared and schools constructed by CMAC in Osapor Pi Village, Malay District, Banteay Meanchey Province.



Saving Lives and Supporting Development for Cambodia

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## GLOSSARY

<b>ADA</b>	Agriculture for Development Action
<b>ADB</b>	Asian Development Bank
<b>ADMAC</b>	Agricultural Development on Mine Areas in Cambodia
<b>AP mine</b>	Anti-personnel mine
<b>AT mine</b>	Anti-tank mine
<b>CBMRR</b>	Community-Based Mine Risk Reduction
<b>CBURR</b>	Community-Based UXO Risk Reduction
<b>CBD</b>	Community-Based Demining Team
<b>CHO</b>	Cambodia Hope Organization
<b>CM</b>	Close Marker
<b>CMAA</b>	Cambodian Mine Action and Victim Assistance Authority
<b>CMAC</b>	Cambodian Mine Action Centre
<b>CMC</b>	Community Mine Clearance
<b>CMVIS</b>	Cambodia Mine Victim Information System
<b>CRC</b>	Cambodian Red Cross
<b>CRS</b>	Catholic Relief Service
<b>CVD</b>	Cambodian Vision for Development
<b>DANIDA</b>	Denmark International for Development Agency
<b>DDSP</b>	Disability Development Services Pursat
<b>DFP</b>	District Focal Point
<b>DH</b>	Dog Handler
<b>EDD</b>	Explosive Detection Dog
<b>EOD</b>	Explosive Ordnance Disposal
<b>ERO</b>	Eastern EOD Regional Office
<b>EU</b>	European Union
<b>FRA</b>	Field Relief Agency
<b>GTC</b>	Global Training Centre
<b>HI</b>	Handicap International
<b>ICRC</b>	International Crescent and Red Cross
<b>JMAS</b>	Japan Mine Action Service
<b>JSC</b>	Jesuit Service Cambodia
<b>L1S</b>	Level One Survey (Impact Survey)
<b>LLD</b>	Long Leash Dog

<b>LUPU</b>	Land Use Planning Unit
<b>LWF</b>	Lutheran World Federation
<b>MAPU</b>	Mine Action Planning Unit
<b>MAT</b>	Mine Awareness Team
<b>MDD</b>	Mine Detection Dog
<b>MMT</b>	Mine Marking Team
<b>MoEYS</b>	Ministry of Education, Youth and Sports
<b>MRE</b>	Mine/UXO Risk Education, or Mine/UXO Risk Education and Reduction (Team)
<b>MRT (MRRT)</b>	Mine/UXO Risk Reduction Team
<b>NGO</b>	Non-Governmental Organization
<b>OEB</b>	Opérations Enfants De Battambang
<b>PMAC</b>	Provincial Mine Action Committee
<b>RACHA</b>	Reproductive and Child Health Alliance
<b>SEADO</b>	Social Environment Agricultural Development Organization
<b>SLD</b>	Short Leash Dog
<b>TC</b>	Training Centre
<b>TS(T)</b>	Technical Survey (Team)
<b>UNDP</b>	United Nations Development Program
<b>UXO</b>	Unexploded Ordnance
<b>WFP</b>	World Food Program
<b>WVC</b>	World Vision - Cambodia



*Our utmost salute to those brave deminers who lost their lives or became permanently handicapped doing their duties.*

*Our utmost salute to those brave deminers, who are enduring the dangerous and painstaking demining work under extreme climate conditions.*

*Their courage and sacrifice, for the safety of others, will be eternally remembered.*

## ACKNOWLEDGEMENT

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Our sincere acknowledgement goes to the Royal Government of Cambodia for the continued support and commitment, both political and financial, to CMAC in support of its endeavor to combat the landmines and ERW problems.

CMAC would like to gracefully extend its acknowledgements to all donors, namely Australia, Canada, Germany, Japan, Peace Boat, Rotary International, the Netherlands, United States, UNA-USA's Adopt-A-Minefield and UNICEF, for their continued support and valuable contributions to CMAC's mine action efforts. At the same time, our deep thanks go to Embassies and Consulates of friendly countries who have always been very active in mine action and supportive to CMAC's demining efforts.

CMAC would also like to acknowledge the good and fruitful partnership with Austcare, BHP Billiton, DynCorp International, Golden West, GTC Bosnia, Japan Mine Action Service (JMAS), Liberty Mining International Co. Ltd, MAG Cambodia, Norwegian People Aid (NPA) and UNDP.

CMAC also warmly acknowledges the advice and assistance provided by GICHD, JICS, ITEP and other specialized institutions.

The Provincial Mine Action Committees (PMAC), Mine Action Planning Units (MAPU), the local authorities, AVI, CRC and HIB and fully thanked for their active roles and contributions to the mine action efforts in Cambodia.

Last, but not least, CMAC pays its kindest and most sincere tributes to its brave deminers and field staff, who endure the extreme working and living conditions, unpleasant Protective Equipment and constant mobility to remote areas, to accomplish the daunting and dangerous demining tasks in order to bring personal safety to millions of affected countrymen. Their families, including wives and children, who sacrifice their personal comfort and other social opportunities, are especially acknowledged and valued.

Without these contributions and sacrifices, CMAC would not be able to deliver its mission to save lives and supporting Cambodia's development.

## FOREWORD

May I express, on behalf of all CMAC staff, my sincerest appreciation and gratitude to the Royal Government of Cambodia, local authorities, local communities, all donors, partners and friends, for their valuable and continual support to CMAC. Taking this opportunity, I am honored to present you CMAC Annual Report 2006.

In the period from January to December 2006, a total area of 26,772,625 m<sup>2</sup> was cleared and released to the communities in support of risk reduction and development. On top of that, 2,032,983 linear metres of mined affected areas was marked for subsequent clearance as well as to warn villagers from stepping into dangerous areas. Further, 16,963 hectares of area reduction was achieved by the technical survey teams during this reporting period. The clearance, marking and area reduction figures achieved in 2006 highlight significant increases compared to productivities for the same period in 2005, especially in area reduction, following the implementation of a new technical survey concept designed to speed up the technical survey process. In total, 35,806 anti-personnel mines, 1,000 anti-tank mines and 113,296 UXO were found and destroyed during this period. Beneficiaries, direct and indirect, from the clearance activities include 106,274 families and 25,627 students in 282 villages.

In regard to costing, the yearly financial statement indicates that the global cost per square meter is less than fifty cents before depreciation. However, this calculation is not based on net cost on clearance alone, but it includes overhead costs and costs of other non-clearance activities such as mine risk education, marking/survey, EOD activities, training and other costs associated with strengthening the community participation in mine action through the participatory approach such as building the volunteer network for Community-Based Mine Risk Reduction and Community-Based UXO Risk Reduction programs in 30 high landmine/UXO casualty districts.

CMAC has always placed considerable attention on research and development of new technologies for applications in mine action. In the past year CMAC smoothly and productively continued with the Explosive Harvesting Program co-managed with Golden West. This Program has already yielded outputs, which have been welcome and positively commented by demining operators including Halo Trust and MAG. The Project for Research and Development of Mine Clearance Related Equipment, financially supported by the Japanese Government, was successful implemented. Three demining machines and 4 GPR mine detectors were tested under this project. This Project contributed significantly to the R&D efforts in Cambodia and will likely have a global impact in other mine affected countries. In addition, CMAC also tested multi-tool sifters from US NVESD attached with CMAC's brush cutters.

On the management side, CMAC tirelessly seeks better ways and approaches to ensure the sustainability and efficiency of the organization. This effort could be noticed in the past year in the restructuring of the operation teams to provide multiple skills, improve efficiency, and increase flexibility and response to the communities. CMAC is committed to employing best practices in mine action to cope and stay abreast of the changing environment in mine action. Institutionally, CMAC constantly works to achieve continual improvements in organizational culture and behaviors through encouraging employee participation, sound human resource management and capacity building. Audit reports also reflect many improvements, cost effectiveness and transparency in CMAC with satisfactory audit opinion on the overall CMAC management. CMAC also continued implementing ISO 9001:2000, which was awarded in February 2004.

Once again, may I express my sincere gratitude to the international community, governments, peoples, international and local partners for the continued support and commitment to help reduce the suffering and risks of the Cambodian people so that a safe environment for development and

livelihood can be restored in the country. This continued support is crucial for both the humanitarian and development causes. We appreciate that this important investment is the prerequisite to high economic returns, poverty reduction, and social/democratic improvement in the affected communities.



Khem Sophoan  
Director General  
CMAC



## EXECUTIVE SUMMARY

Despite enormous efforts by all the demining operators in Cambodia in the last 13 years to combat the landmine and UXO problem, these killing tools still continue to maim and kill around 800 to 900 people per year. Based on the CMVIS report, the following casualty data have been recorded in the last ten years.



Despite significant reductions in casualties in the past years from 2,157 casualties in 1998 to 862 in 2005, the number of casualties caused by landmines and UXO in Cambodia still remains extremely high if compared with other mine/UXO affected countries in the world and in particular in this region. The significant drop (by around 50%) in the number of casualties in 2006 (to 440 cases) is a positive sign of impact delivered by mine action efforts and should be sincerely praised. However, due to the magnitude of the problem and the nature of contextual economic and demographic dynamics of Cambodia, it is probably premature to definitely make a firm conclusion from this drop, and more efforts need to be made to ensure the drop continues until Cambodia reaches the zero-victim state by the year 2012 as intended by the Royal Government of Cambodia.

In the past 13 years, CMAC made significant contributions to solving the landmine and UXO problem and contributed remarkably to the casualty reduction, community development and people's awareness of the risks associated with their daily activities in the affected areas. The following shows the result of CMAC's operational activities, in terms of clearance and mine/UXO destruction, from 1992 to December 2006:

- Number of minefields cleared: 3,263
- Cleared 172,048,889 m<sup>2</sup> of contaminated land
- Area reduction achieved: 22,254.98 ha
- Found and destroyed 346,796 anti-personnel mines
- Found and destroyed 6,573 anti-tank mines.
- Found and destroyed 1,141,172 UXO's,
- Found 31,536 kg of small calibers, and
- Unearthed 358,161,994 fragments.

In 2006, CMAC planned to clear a total area of 22,347,500 m<sup>2</sup>. Of these approximately 252 sites would be cleared for large scale development. These included 45 sites for resettlement, 48 for resettlement and agriculture, 86 for agriculture, 44 sites for rural roads (equivalent to 78,089 m of road), and the remaining for water canals/irrigation, schools, water ponds, pagodas and others. This clearance activity was expected to benefit 173 villages which were located in the high casualty areas.

In other terms, this clearance effort would benefit 3,836 families directly, 25,806 families indirectly, and a total of 2,365 school children. Approximately 154,551 people were expected to benefit from CMAC demining operations in 2006. In addition to these, CMAC planned to release landmine/UXO threats from approximately 300 small-scale development sites treated as risk reduction tasks. This would be equivalent to approximately 3,608,000 m<sup>2</sup> of high casualty areas. At the same time, CMAC planned to collect and destroy approximately 123,500 UXO.

To achieve this work plan, CMAC deployed the following teams:

N.	MINE ACTION TEAMS	Number of Teams Deployed in 2006											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Demining site	1	1	1	1	1	1	1	1	1	1	1	1
2	Normal Demining Platoon (NP)	3	3	3	3	3	3	3	3	3	3	3	3
3	Mobile Demining Platoon (MP)	38	38	38	38	38	38	38	38	36	36	36	36
4	Explosive Ordnance Disposal Team (EOD)	21	21	21	21	21	21	21	21	21	21	21	21
5	Technical Survey Team-Small (TST-small)	19	19	19	19	19	19	19	19	19	19	19	19
6	Community Mine Clearance Team (CMC)	13	13	13	13	13	13	13	13	13	13	13	13
7	Mine Risk Education and Reduction Team (MRE)	6	6	6	6	6	6	6	6	6	6	6	6
8	Community-Based Mine Risk Reduction (CBMRR)	23	23	23	23	23	23	23	23	23	23	23	23
9	Community-Based UXO Risk Reduction (CBURR)	13	13	13	13	13	13	13	16	16	16	16	16
10	Short Leash Mine Detection Dog Team (SLD)	10	10	10	10	10	10	10	10	10	10	10	10
11	Long Leash Mine Detection Dog (LLD)	2	2	2	2	2	2	2	4	4	4	4	4
12	Mechanical Brush Cutter (BC)	26	26	25	25	25	25	25	25	25	25	25	25
13	Technical Survey Team-Large (Large-TST)	4	4	4	4	4	4	4	4	4	4	4	4
14	Community-Based Demining Platoon (CBD)	1	2	2	2	2	2	2	5	5	5	5	5

To support the total capacity deployed in the field operations, CMAC received funding through two main channels: the UNDP's "Clearing for Results" Project and bilateral agreements, commonly called bilateral projects. The UNDP's "Clearance for Results" project was a multi-donor funding project supporting CMAC to clear landmines and ERW, conduct technical survey and area reduction, provide mine and ERW risk education and reduction, and conduct training in mine action. Specific focus was placed on the tangible outputs in terms of area cleared and the socio-economics of the clearance activities. Bilateral projects in 2006 were mostly continued projects from the previous year, except Austcare, which started from March 2006, and Project for Research and Development of Mine Clearance Related Equipment. In 2006, a number of contractual service projects surfaced, highlighting the trend in mine action to support economic, infrastructure and industrial development. It is also expected that more bilateral contractual service projects will be implemented in the future.

Project Title	Donor/Partner	Project Locations
The Integrated Demining and Development Program	Netherlands/NPA	DU1, Banteay Meanchey
Integrated Mine Action and Development Program	Australia/Austcare	DU1, Banteay Meanchey
The Project for Supporting Humanitarian Demining Activities	Grassroots-Japan	DU2, Battambang
The Community-Based Demining (CBD)	Japan/JMAS	DU2-Battambang
Humanitarian Mine Action Project	USA	DU3, Pailin and Samlot (Battambang)
The Project for Supporting Humanitarian Demining Activities	Grassroots-Japan	DU4, Kg Thom, Preah Vihear and Oddar Meanchey
Mine/UXO Clearance for Access Road from Koh Ker to Kampich Village	Peace Boat, Japan	DU4, Preah Vihear
Humanitarian Demining	Germany	DU6, Siem Reap & Oddor Meanchey
The Research and Development of Mine Clearance related to Equipment	Japan/JICS	Siem Reap/Battambang
UXO Clearance Activities and CBURR Project	Japan/JMAS	Prey Veng, Svay Rieng & Kandal
UXO Clearance Activities and CBURR Project	Japan/JMAS	Kg. Speu, Kg Cham, Prey Veng, Svay Rieng & Kandal
Graduate Exchange/Internship Program	NPA	CMAC HQ and Training Centre (Kg. Chhnang)



Explosive Harvesting Program (EHP)	USA/Golden West	CMAC Training Center (Kg. Chhnang)
Provision of MDD and Technical Assistance	NPA/GTC-Bosnia	CMAC Training Centre (Kg. Chhnang)

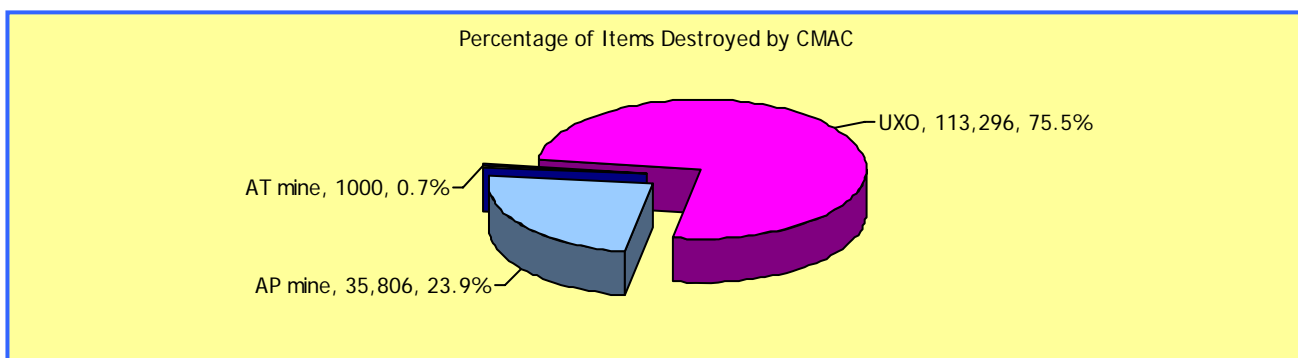
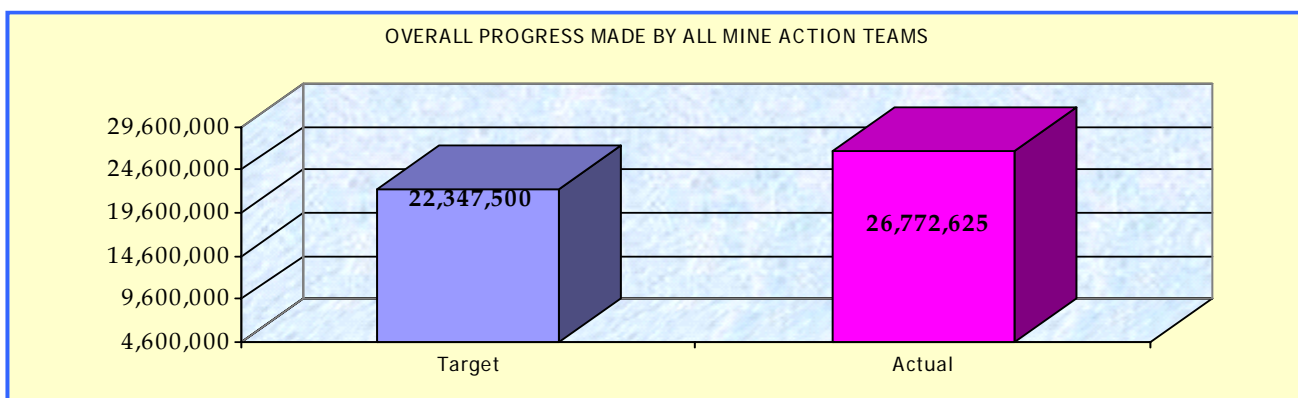
**Contractual Service Unit:**

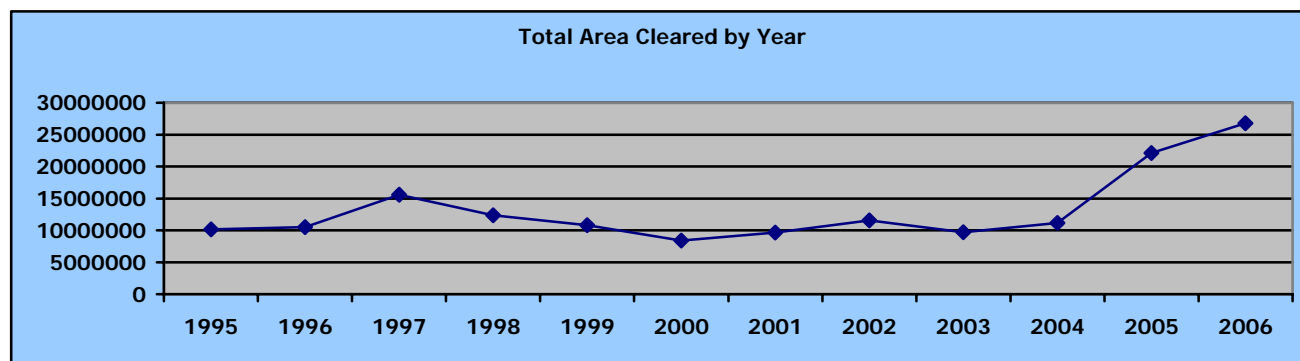
Project Title	Donor/Partner	Project Locations
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Battambang and MAG targeted zone
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Samlot, Ratanak Mondul, (Battambang) and Pailin
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Preah Vihear and MAG targeted zone
SEA-UNION CONSTRUCTION (Cambodia) Co. Ltd	Private Company	HQ-Phnom Penh
Liberty Mining International (LMI) Pty Ltd	LMI	Ratanakiri province
The Cambodian Airport Management Service	Phnom Penh Airport	HQ-Phnom Penh

2006 witnessed a remarkable operational achievement combined with a number of new initiatives in operational methods and technologies. These improvements and positive changes were a result of CMAC’s commitment to the policy of “Safety, Quality and Productivity” to meet the donor and partners’ requirements as well as the changing environment in mine action.

During the reporting period, CMAC achieved the highest operational productivity ever accomplished since its establishment. Compared with the previous years, the progress within this period is even higher than the total productivity in some previous years, and nearly as high in some years. It is worth mentioning that during this period, CMAC encountered a serious accident involving death of an EOD team leader during operations and loss of both eyes to another.

Description	2006 Progress
Number of minefields cleared and handed over	585
Area cleared (m <sup>2</sup> )	26,772,625
Area Reduction (ha)	16,944.85
Area marked (m)	2,032,983
Anti-personnel mines	35,806
Anti-tank mines	1,000
UXO	113,296





Besides mine and UXO clearance, CMAC also carried out other important mine action (non-clearance) activities such as mine risk education, survey, area reduction, training and community-based mine/UXO risk reduction program through a participatory approach whereby the affected community is empowered to carry out mine/UXO awareness education, risk assessment, prioritization of mine action tasks and establish community mapping about the scope of mines and UXO in their own community. Through 2006, CMAC's Mine Risk Education (MRE) teams and CBMRR network conducted a total of 64,173 household visits, delivered 3,598 MRE sessions, reaching an audience of 275,118 people. During this reporting year, CMAC had 18 CBMRR's District Focal Point Officers, who were supervised, assisted and monitored by 5 Provincial Coordinators, and 434 volunteer networks working for the District Focal Points in 143 villages of 56 communes. In addition, there were also 16 CBURR District Focal Point Officers working closely with the UXO affected communities in 16 high casualty districts in Svay Rieng, Kandal, Prey Veng and Kampong Speu Provinces, covering a total of 290,289 households with total population of over 1.5 million people. 75 CBURR volunteer networks were assisting the District Focal Points in information collection and risk education.

Activities	Achievements
Number of villages reached	3,648
Number of sessions delivered	3,598
Households visited	64,173
Total number of people attending mine risk education	275,118

It should be noted that in prioritizing the minefields for clearance, CMAC fully follows the MAPU/PMAC process. This incorporates the socio-economic assessment and land use management after clearance. The following table shows the beneficiaries from the land that CMAC cleared in 2006.

Type of Beneficiaries	Number of Beneficiaries
Direct beneficiaries (families)	5,118
Indirect beneficiaries (families)	53,756
Students	25,627
Beneficiary villages	234

It is worth pointing out that the attainment of such remarkable operational productivity was a result of a number of contributing factors. Improved methodologies and technologies, enhanced organization behavior, sound control and monitoring system and constant commitment to continual improvements in all areas of operations and management are some of the factors contributing to the achievement.

In response to the Royal Government's call for accelerated area reduction, and based on experience and practice on the ground, especially related to minefield information, CMAC realizes that technical survey is one of the appropriate answers to identifying the real problems and quickly releasing low-threat and no-threat land to the communities for productive use, especially when resources to physically clear every centimeter of the minefields are scarce. In order to speed up technical survey

information collection, CMAC redefined its technical survey concept and process in 2006. This new concept of technical survey utilizes the community-based mine risk reduction network members as the moderator of information by using all existing sources of information within their community and by coordinating with key informants as well as the local authorities to ensure that the obtained information is verifiable and reliable. While the new concept of technical survey involves a lot of inputs from the local authorities and the CBMRR, its outputs (mine/UXO contamination maps) are distributed more widely to the village authorities, PMAC/MAPU and CMAA for planning and prioritization purposes. Land released through this process can also be removed from the contamination map in the national database.

The new concept of technical survey was implemented in the last part of the reporting year and it produced a very positive result. In the past year, the technical survey teams completed technical survey in 59 villages, achieved a total of 16,944.85 ha of area reduction, and also identified 9,097.11 ha of contamination area outside the Level One Survey records/map. In addition, they also cleared 101,800 m<sup>2</sup> of land and found and destroyed 361 mines and 146 UXO in the survey areas.

The explosives remnants of wars scattered virtually everywhere in the country after the three-decade long conflicts and heavy US bombing continue to pose fatal threats to millions of civilian population. The evidence of the magnitude of the ERW problem lies with the high casualty rate that Cambodia suffers from. Furthermore, with the expanding economic and commercial activities in the eastern provinces as a result of road links, mining exploration contracts, and tourism growth, it is required that the response to the ERW problem be increased. Due to this emerging demand, CMAC has expanded its EOD capacity in the eastern provinces to respond to the growing economic and development activities in the areas.

On 10 January 2006, a new Eastern EOD Regional Office (ERO), located in Kampong Cham, was established to be a central point of UXO clearance and risk education activities in the eastern part of Cambodia. This Office was established to manage and supervise ERW activities in eastern provinces such as Kampong Cham, Prey Veng, Svay Rieng, Kratie, Stung Treng, Mondul Kiri and Ratanak Kiri to respond to the community requirements for response to explosive remnant of wars in these areas. As the economic and development activities are starting to take roots in these provinces, including mineral exploration, it is expected that the economic and demographic boom in the area will increase the level of threats posed by the presence of ERW's in the areas.

CMAC has a clear vision to expand and strengthen its capacity in the field of ERW in the coming years. As part of this commitment, CMAC has recently initiated to develop the new concept of Unexploded Ordinance Detection Dog (EDD), which will become another essential tool for UXO clearance operations. The current CMAC's EOD capacity has been focusing on collecting UXO on the ground mostly reported by the police and the communities. However, today there is a greater demand for underground UXO clearance for subsequent use of these UXO affected areas for economic and rehabilitation activities. CMAC's EDD has been developed and trained with the dedicated support by the Norwegian People's Aid (NPA) and its MDD Training Centre in Bosnia (the GTC). In 2006, CMAC started to train 4 explosive detection dogs (EDD) to further speed up the ERW clearance operations. CMAC plans to trial and put these dogs into operations in 2007 to evaluate their performance in the UXO fields. Once the EDD teams are fully operational, it is expected that they will contribute significantly to speed up the effort to clear UXO, which still lie in millions scattered underground across Cambodia and pose formidable threats to Cambodians.

CMAC is committed to remain a leading organization in terms of efficiency, productivity and safety. However, this is hard to achieve without the support of technology. In this respect, CMAC continues its utmost effort to conduct research and development to improve demining technology to meet the field requirements. In 2006, CMAC carried out a number of research and development projects including the continued Explosive Harvesting program supported by the US Government, the Project

for Research and Development of Mine Clearance Related Equipment supported by the Government of Japan, the Sifting Bucket Testing Project, the Magnet Test Project, etc. The Project for Research and Development of Mine Clearance Related Equipment was a major project conducted in the reporting period, bringing 3 demining machines, 3 GPR mine detectors and 1 buggy for detector mounting.

In addition, CMAC has also established high standard and quality test facilities in Siem Reap and in Kampong Chhnang, able to house test and evaluation of mines and UXO detectors of various types and depths (up to 12 metres deep). The construction of these test facilities were supported by the Japanese and US Government. These test facilities will be able to house and accommodate any types of tests. In addition to the facilities, CMAC also upgraded the skills and experience of its staff to plan, manage, and carry out quality test and evaluation of mine clearance related equipment.

CMAC has always been a very strong supporter of linking mine action with development. It is clear that land cleared can only benefit the people and will fully justify the cost if the land is properly used for optimum benefits. This is the reason why CMAC strictly follows the prioritization process of the PMAC/MAPU to ensure that, in addition to risk reduction, minefields selected to be cleared offer the most benefits to the communities and that these benefits are squeezed from every dollar spent on mine clearance.

CMAC also has long experience working with development partners such as Austcare, CARE International, NPA, Peace Boat, Rotary Club, and ZOA. In addition to clearance support, these organizations provide development support to the mined communities to re-activate their livelihood, improve their living conditions, enhance their social integration and raise their esteem and value. In addition, CMAC also provides development support the communities through its own development fund mobilized from donors. In other words, CMAC also builds schools, digs ponds, makes access roads and water canals on the land it has cleared. These activities have contributed enormously to the Royal Government's effort to poverty reduction and eradication.

In corporate management, CMAC made tireless efforts to strengthen CMAC and built up its capacity to meet the changing environment in mine action. Effective fund raising, project management, promotion of partnership and ownership, national and international coordination and relations, internal capacity building, in-house management issues, safety and quality of demining, financial management and effective deployment (to suit the resources available) – these were some of the critical tasks which consume a great deal of the management time. As a learning organization, CMAC management will constantly seek for better ways for organization, by defining an appropriated policies and work practices to “fit” the generic strategies of cost reduction, quality enhancement and safety through innovation of new demining technologies and methodologies.

The organizational culture and behaviour changes has been linked to changes in mine action with the impact of globalization leading to the need for better service, cost effectiveness, flexibility, responsiveness and quality. With strong commitment to these qualities, it is not only having an impact on CMAC as an organization, but on the overall cost and productivity of demining operations. Despite some foreseen and unforeseen problems of financial shortfalls, CMAC was able to maintain a lower cost at a reasonable level. The changing environment, policies and funding mechanisms and levels in mine action as well as internal drive to achieve efficiency and cost effectiveness have made this possible.

## 2006 OVERVIEW

### 1. CAMBODIA'S LANDMINE AND UXO PROBLEM

As a lethal legacy of various conflicts over a period of three decades or so lasting until late 1997, both within and outside its borders, the Kingdom of Cambodia became one of the most heavily landmine/UXO-contaminated countries in the world. Even today, despite enormous efforts made by all demining operators and significant drops in the number of casualties in the past ten years, landmines and UXO continue to kill and maim close to one thousand people every year (according to the CMVIS reports). Importantly, the mine/UXO problem poses a major threat and barrier to all rehabilitation and development activities in Cambodia. Rural civilian access to essential facilities such as water sources, roads, bridges, schools and agricultural land is still seriously restricted and hazardous in many parts of the country.



In its Article 7 report submitted to the United Nations on 15 April 2004, Cambodia reported that a Landmine Impact Survey was completed in April 2002. The Project surveyed the totality of the 13,908 Cambodian villages representing an estimated population of 11,460,661 persons (0.2 million households). The survey results show that there are *3,075 areas* suspected of being contaminated by mines, unexploded ordnance (UXO) and cluster bombs. Those areas represent a surface of 4,466 km<sup>2</sup>. A total of 46.2% of all Cambodian villages (*6,421 villages*) are suspected of being contaminated, with 23.7% of these villages being impacted very severely, 24.2% impacted severely and 52.1% less severely.

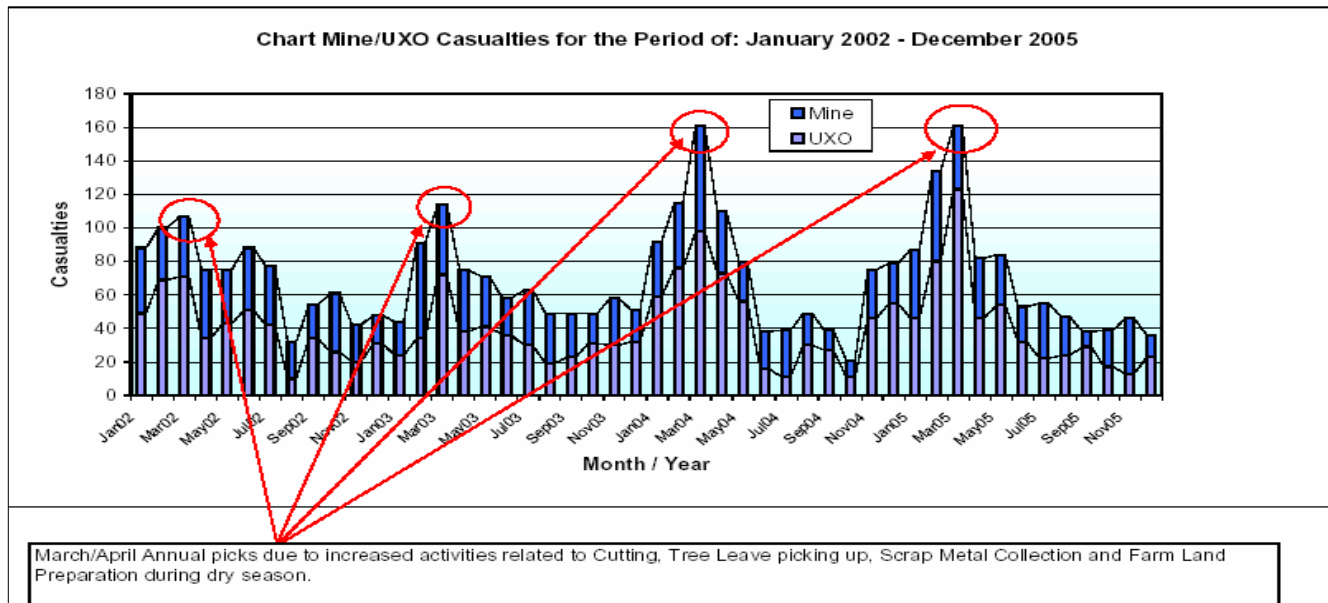
The impact of landmines on villages can be categorized as follows:

- 22% do not have enough agricultural land,
- 19% have high numbers of human casualties,
- 18% are affected in their gathering activities,
- 15% do not have enough housing land,
- 14% have experienced a loss of livestock, and
- 12% have a difficult water access.

A total of 7,487 villages (53.8% of all villages) did not report any contamination. The project estimates that *5.18 million Cambodians* are at risk due to the presence of mines and UXO.

Although there are new claims that the real mine and UXO problem in Cambodia is less severe than these figures (CMAA announces that only around 10% of the total problem can be considered high priority), there is no concrete and conclusive evidence and technical assessment to prove this theory, and today mines and UXO continue to kill and maim Cambodian civilians nearly on a daily basis. It is vital to note that nearly 80% of the landmine incidents and nearly 60% of the UXO incidents occur in the villages and on the farms as a result of livelihood activities. Farming and traveling cause 66% of

the landmine incidents while handling cause up to 50% of the UXO incidents. This indicates a concentration of threats to the villagers is inside the villages themselves since people are already living in the minefields due to the lack of safe land.



There is also a new theory about the threats posed by the different types of minefields. Some suggest that residual minefields, i.e. those minefields already cultivated by the people to reclaim land for farming and settlement purposes, pose no threats or very little threats to the villagers after 2 to 3 years of use. From CMAC's experience, mines and UXO continued to be found in these residual minefields and more civilians are injured or killed in these minefields as already indicated by the statistics above. CMAC strongly supports the Royal Government's Area Reduction Policy to release the suspected area so that scarce resources can be used for higher impact areas. According to the Policy, there is no reason to maintain the current status of mine suspected lands which have been turned to productive use. This is certainly a correct way of addressing the issue; however, it is important to determine the appropriate methodology, technique and practice to achieve this objective, and such technique and practice should be standardized, systematic and reliable. In this respect, CMAC has developed substantial experience with its technical survey, which is also mentioned in the Area Reduction Policy, which aims to identify and categorize different types and levels of landmine and UXO threats. Through this practice, sizeable area of land formerly suspected of being contaminated can be released in a systematic and reliable way.

Recognizing that landmine and UXO problem is a serious challenge for the Royal Government of Cambodia, both in terms of physical and economic contexts, the Royal Government is committed to addressing this high priority issue by setting an ambitious vision to achieve a zero-victim state by 2012 and zero impact by landmines and UXO by the year 2020. However, in practical term, based on over ten years of experience, with the current resources, technology and methodology, the set vision is truly a serious challenge for the mine action operators. It is very important that Cambodia, as well as the international community who are obliged by the International Convention on Landmines, to work very hard, consistently and collectively to find innovative ways and provide sufficient resources to achieve the vision.



Today, mine action environment is changing as the deadlines of the Ottawa Convention are nearing for many countries and after many years of funding flowing into mine action worldwide. In Cambodia, particularly for CMAC, several emerging factors are having an impact, be they negative or positive, on CMAC planning and the way of conducting business. Factors such as new funding arrangements (such as that through UNDP), the concept of result rather than process, changing policies and priorities of several key donors, latest developments of mine action in the region and around the world, advancement in technology, and the Royal Government's pressure to quickly reduce the landmines and UXO problem are concretely having an impact on CMAC decision on the way forward and future of the organization. Be it internal or external pressure, CMAC management realize that CMAC has to maintain its competitive advantages if it were to maintain donor confidence and sustainable level of funding.



Due to the changing environment in mine action, CMAC has to take bold steps and tough decisions to make reforms of its organizational structure, the operational team structure and missions, to redefine mine/UXO clearance techniques and methods, and introduce new initiatives in operations as opportunities emerge and the circumstances favor. While some measures are drastic and immediate and others modest and gradual, they all aim to improve the overall management, quality, efficiency and productivity of the organization without the compromise with safety.

## 2. 2006 OVERVIEW

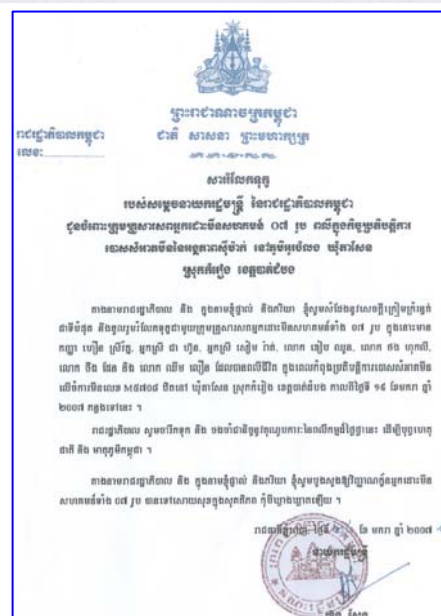
### 2.1. Legal Status of CMAC

#### Article 1:

The Cambodian Mine Action Centre has been established hereinafter referred to as CMAC. CMAC is a public administrative institution with legal entity placed under the responsibility of the Prime Minister of the Royal Government of Cambodia.

It is clearly stated in the Royal Decree on the Legal Status of Cambodia Mine Action Centre (CMAC) in August 2001 that CMAC is a national institution which is placed under the responsibilities of the Prime Minister of the Royal Government of Cambodia.

During the period of writing this annual report 2006, **Samdech Prime Minister Hun Sen** issued an official condolence letter on behalf of the Royal Government of Cambodia, himself and his family to share his deepest sympathies over the tragic death of seven CMAC deminers who lost their lives in Battambang on 19 January 2007. This revealed Samdech Prime Minister's commitment and carefulness to CMAC deminers who work tirelessly to protect people from the appalling legacy of past conflict.



Condolence letter of Samdech Prime Minister Hun Sen

## 2.2. Corporate Management

In 2006, it was a big change in UNDP funding mechanism which moved from General Trust Fund to Clearing for Results Project or output based project.

Effectiveness, efficiency, safety and transparency were still in demand in the project framework. However, CMAC management was ready to set up an optimal vision to meet this new challenging environment by strengthening its operations strategies and methodologies at the field level. The cost minimization was also a key principle for changes, thus CMAC management has been focusing on a strong interest



Samdech Prime Minsiter **Hun Sen** in the Celebration Ceremony of CMAC Headquarter and Handover Ceremony of Demining Equipment Phase IV donated by the Government of Japan to CMAC on 27 June 2005

with human resource management which CMAC calls resource-based human resource management, in which human resources are viewed as the basic of competitive advantage. This means that CMAC achievement is not only derived from the formal reorganization and reshaping of work, but it is also powerfully derived from the workforce in terms of the training and expertise available to the organization, the adaptability of employees which permits the organization strategic flexibility, and the commitment of employees to the organization's work plans and goals.

The organizational culture and behavior changes has been linked to changes in mine action with the impact of globalization leading to the need for better service, cost effectiveness, flexibility, responsiveness and quality. With strong commitment to these qualities, it is not only having an impact on CMAC as an organization, but on the overall cost and productivity of demining operations. Despite some foreseen and unforeseen problems of financial shortfalls, CMAC was able to maintain a lower cost at a reasonable level. The changing environment, policies and funding mechanisms and levels in mine action as well as internal drive to achieve efficiency and cost effectiveness have made this possible.

Strategically, the rolling Five-Year Strategic Plan which continues from the original Five Year Plan 2003–2007 has served a clear vision and provided an indicative direction in mine action for CMAC. Entering the fourth year of implementation, CMAC proved to be on the right track towards significantly contributing to the vision landmines and UXO impact free set by the Royal Government of Cambodia. The Work Plan 2006, through a bit humbly set to meet the funding situation, reflects CMAC's effort to adhere to the Strategic Plan. Based on the operational progress achieved in year report, it was reasonable to assume that the level of productivity must satisfactorily reach the set in the Five-Year Strategic Plan while the level of cost is significantly reduced.

As part of CMAC's commitment to good governance, transparency and cost effectiveness, a number of audits were conducted each year on different projects implemented by CMAC. CMAC's proof of good governance, efficiency and transparency was reflected in several recent audits reports by different well-known audit firms such as PricewaterhouseCoopers, KPMG and Ernst & Young, which have expressed satisfactory opinion on the overall management of CMAC, with some rooms to be



improved. The implementation of ISO 9001-2000 was another good example of CMAC’s strong commitment to quality management system, which is the backbone for a successful organization.

In 2006, CMAC management made tireless efforts to strengthen CMAC and built up its capacity to meet the changing environment in mine action. Effective fund raising, project management, promotion of partnership and ownership, national and international coordination and relations, internal capacity building, in-house management issues, safety and quality of demining, financial management and effective deployment (to suit the resources available) – these were some of the critical tasks which consume a great deal of the management time. As a learning organization, CMAC management will constantly seek for better ways for organization, by defining an appropriated policies and work practices to “fit” the generic strategies of cost reduction, quality enhancement and safety through innovation of new demining technologies and methodologies.

One important milestone in CMAC’s collaboration and partnership effort in mine action was the CMAC – MAG Cooperation Agreement whereby CMAC seconded 3 CMAC’s MDD team to MAG in support of MAG’s humanitarian demining effort. This cooperation agreement indicates not only the importance of MDD as a tool in mine action and the credibility of CMAC’s MDD program but also the partnership, cooperation and coordination between demining operators in Cambodia, which is one of the prerequisites to mine action success in this highly contaminated country.

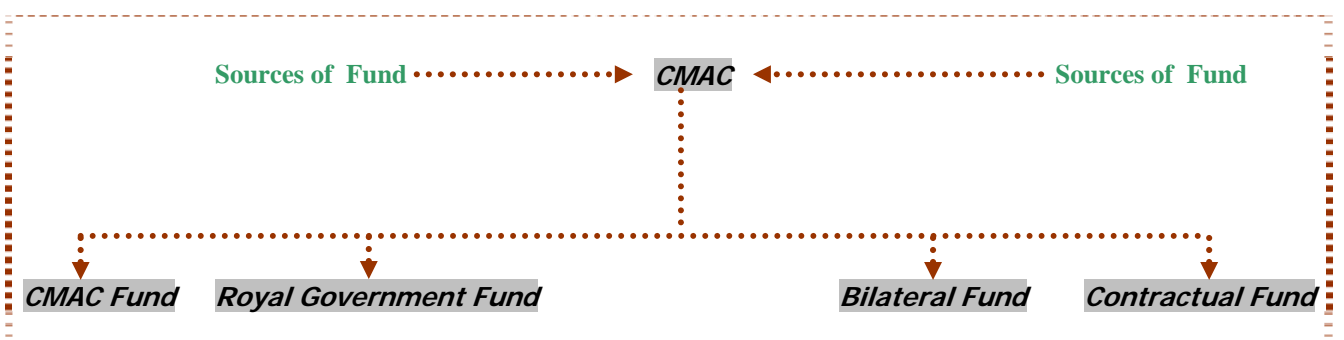
In strong efforts to improve demining technologies and methodologies, CMAC was committed to bringing in the most advanced technologies to be employed in mine action. Several test and research projects were carried out in August 2006 at CMAC Centre for Training and Research &Development in Mine Action and Explosives Remnants of War in Siem Reap, including test of different types of mine detectors (including new types of detectors), test of mechanical brush cutters (Komatsu and Hitachi), trial of new search drill, which are expected to help increase demining productivity and efficiency. Whereas the Explosive Harvesting Research Program at CMAC Training Centre in Kampong Chhnang Province was a successful project which was able to support 7.6% of TNT in late 2006 over the total explosive consumption in CMAC.

### 2.3. Financial Management

In general, financial situation in 2006 was stable. It was able to sustain the operational activities at the field even though budget flows of some projects were delayed or came late.

It was a little bit difficult to manage some projects whose budget transaction was delayed or came late. This issue, however, could be solved smoothly without interrupt to the field operations of each project. The budget of each project was carefully managed and strictly controlled by using sunsystem software as a recording and controlling tool.

The fund from various sources was separately classified: *CMAC Fund, Royal Government Fund, Bilateral Fund and Contractual Fund.*



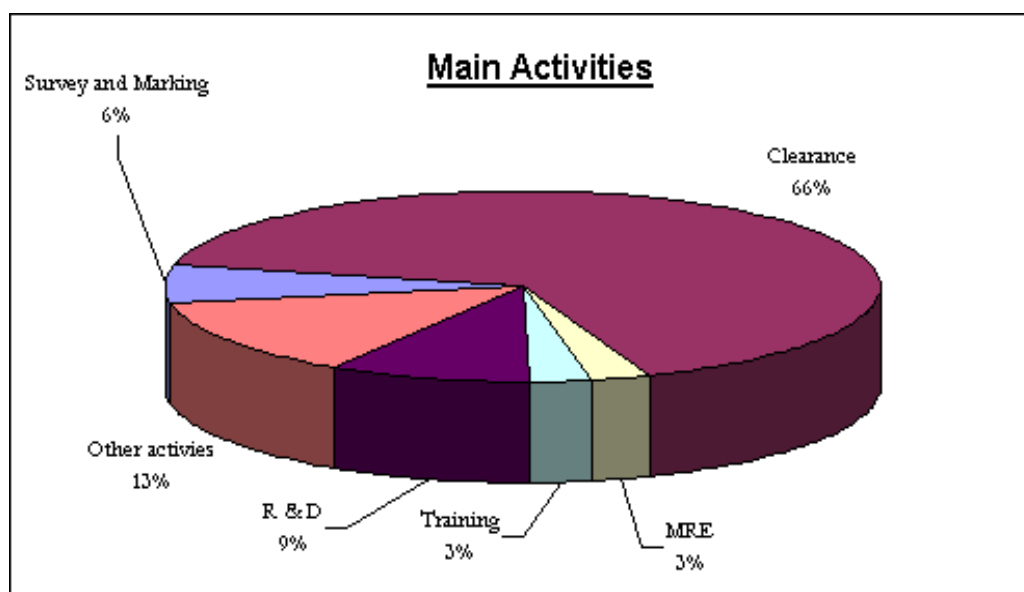
**Financial Report**  
**Period from 01 January to 31 December 2006**

**1. Presented by Donors' project:**

No.	Project Title	Expenses
1	Integrated Mine Action in Development project - AustCare *	146,079.93
2	Social Affair for Training Centre - Rotary International	3,000.00
3	Land Clearance & Build School (Osampor) - Peace Boat*	93,909.82
4	Mine Clearance for Access Road (Koh Ker) - Peace Boat	22,446.49
5	Administrative support to EOD project - JMAS	6,742.84
6	EOD Clearance & CBURR project - JMAS *	50,102.72
7	Community Base Demining project - JMAS *	157,326.71
8	EOD Clearance & CBURR project - JMAS *	99,068.55
9	Humanitarian Demining DU2 project - JPN (Grass Root)	917,577.76
10	Humanitarian Demining DU4 project - JPN (Grass Root) *	733,807.64
11	Research & Development project - JPN *	621,376.54
12	Mine Clearance project at DU1 - NPA	672,782.77
13	Young Intern Program - NPA *	4,731.69
14	Mine Clearance (Contract) by MDD - MAG *	191,514.72
15	Clearing for Result - UNPD	3,450,000.00
16	Mine Clearance (Contract/Development) projects - Agencies	15,601.78
17	Administrative Support project - RGC **	250,633.47
18	CBMRR project - UNICEF	44,663.68
19	Humanitarian Demining (Pailin) - USA *	1,098,352.92
20	Humanitarian Demining (Pailin) - USA *	705,434.56
<b>Total</b>		<b>9,285,154.59</b>

**Note:** \* crossing the year  
\* \* bearing liability

**2. Presented by Main Activities:**



## 2.4. Logistics and Human Resource Management

To run field operations smoothly, it was very important to focus and consider on logistics and human resources management. Logistics responsibilities covered the areas of *logistics support, maintenance and transportation, assets control and management*, whereas human resources management focused on *health care and human resources development and management, etc.*

### 2.4.1. Logistics Section and Procurement

Some of the key achievements of Logistics Section during the year could be illustrated stated below.

- Reconciled the stock taking results for the year 2005 for expendable and non-expendable store, produced final stock take report and submitted it to Chairman of the Property Survey Board, and distributed to Demining Units and concerns departments and offices,
- Prepared list for fixed disposal and submitted to the Property Survey Board for approval,
- Coordinated with Finance Department to register new received fixed assets donated by UNICEF (12 items), NPA (10 items), Hitachi Tierra (01items) and Japan Grand Aid (Phase IV, 1,670 items), JICA (6 items) and 65 items purchased by Demining Unit 6 into SunSystem, and disposed broken assets from Fixed Assets Register List including 11 mine detection dogs and 40 vehicles,
- Implemented the process of store management through SunSystem (Inventory Control Module) as an initial stage for Accrual Based Accounting System and introduced this system concept to Demining Units,
- Strengthened the implementation of Re-supply system to Demining Units and to operation sites as well, and coordinated with concerned Department to equip new establishment and re-structured teams,
- Provided mine detectors maintenance services to all Demining Units. In 2006, Mine Detector Office repaired 1,093 set of mine detectors including 1,073 F1A4 detectors and 20 deep search detectors,
- Identified and discussed with finance department on the possibility of General Stock creation,
- Conducted surprise check on explosives used by mobile teams and evaluated the requirement of explosives to support CMAC operations,
- Coordinated with Golden West (Explosive Harvesting Program) in order to get recovered explosives 3,500 each, 100g per each, to support demining operations of CMAC,
- Conducted spot check on store management and utilization at demining units,
- Regularly updated the fixed assets movement, its status and users into SunSystem based on reports and stock take results,
- Coordinated with Operations Department to establish the procedures for Safety storage, utilization and transportation of explosive,



- Coordinated with Operations Department to conduct test and evaluation of new mine detector (Minelab-F3) and provide equipment and services support for test and evaluation demining related equipment project support by the Government of Japan,
- Conducted stock taking for the year 2006 on expendable and non-expendable stores for the whole CMAC.
- Coordinated on custom clearance for donated equipment and purchased equipment/materials including mine detection dogs, mine detectors, spare parts and ties, etc.
- Provided support services on fuel utilization contract with tax exemption, suppliers contracts and visa arrangement for technical advisors.



#### 2.4.2. Maintenance and transportation

Transportation is the biggest component of CMAC operation and as such constitutes the largest cost items in the inventory. The cost is cumulative in spare parts, fuel and maintenance costs. In order to strengthen and improve the capability and quality of vehicle and heavy machine maintenance toward cost effectiveness, the maintenance procedures and responsibility of central workshop were reformed and the staff was restructured. Under this reform, central workshop is responsible for brush cutter maintenance, service C and heavy repair and maintenance all vehicles of the Demining Unit 2. In addition, a request for Workshop Management Advisor, Project Type Technical Cooperation, was submitted to the Government of Japan by the Royal Government of Cambodia.



At the headquarter level, the maintenance and transportation section performed all the best to take care the transport mean allocated to support headquarters activities and repaired vehicles to support new projects including research and development (Test and evaluation project support by the Government of Japan), JMAS project (Community-based Demining Teams) and Technical Survey with new concept. Specifically, in 2006, there were two projects established and planed to implement at the beginning of 2007. Therefore, 27 vehicles were upgraded to support these new projects and for replacement the unserviceable vehicles from Demining Units.



The surprise check on vehicles maintenance and utilization by Demining Units was conducted by Maintenance and Transportation Section. In addition, the flow chart and vehicle repair processes/procedures at headquarters was revised and implemented. The Maintenance and Transportation Section involved in disposal process of the broken and un-repairable vehicles of CMAC.

### 2.4.3. Medical and Health Support

Medical staffs committed their best effort to provide hygiene education and health promotion, consultation and treatment in order to improve CMAC staff health, especially the deminers who are working on the minefields in the remote areas.

The disease statistics, suspicion of disease 80%, and mine and UXO accident can be summarized below.

No.	Description	2004	2005	2006
1	Medical Consultations, cases	52,382	41,825	39,920
2	Hospitalized, case	271	272	210
3	Infirmary rest, case	435	328	305
4	Malaria, case	183	104	67
5	Mine/UXO accident	14	11	8

As mentioned in the table above, in 2006, the medical consultation was decreased by 23.8% and 4.6% compared to 2004 and 2005 respectively. At the same period malaria was decreased by 63.39% compared to 2004 and 35.58% compared to 2005, and CMAC staff injured by mine and UXO was significantly decreased by 42.88% and 27.27% compared to 2004 and 2005 respectively.

CMAC has deployed 51 medical staff with various education level including doctors, medical assistants and nurses. With the collaboration and support from US Embassy, 31 CMAC staff (Medics) from different demining units were trained on basic and advanced medical course conducted by the US trainers/facilitators at Training Centre, Kampong Chhnang. With this training



course, the capacity of the medics was upgraded and their works were improved. In addition, 315 field staff from different demining areas were trained on First Aid and MEDEVAC refresher course and disease prevention methods conducted by CMAC Medical Officers and Instructors.

Health and safety promotion was one of the important activities of Medical Section. The various activities implemented in 2006 were as follows:

- Hygiene for food and site accommodation, Anthelmintic treatment for all field staff,
- Malarial prevention through spreading chemical solution at site accommodation weekly and treating mosquitoes net for field staff 2 times per year,
- Monthly check and refill first aid kit for all platoons and teams,
- Conducted quarterly MEDEVAC exercise at each mine field,
- Conducted medical check to ensure the health of staff and provided physical examination for 75 staff,
- Published health flash for CMAC medics and,
- Conducted medical meeting to evaluate the activities and results and find out the effective and efficient way for further improvement.



#### 2.4.4. Human Resources Management

##### 2.4.4.1. Staff Deployment

CMAC, in 2006, deployed 2,365 staff including 2,175 is permanent staff and 190 SSA staff. These staff was deployed in various locations and could be summarized, as follows:

No.	Location/ Operation Site	Permanent Staff	SSA Staff	Total (Dec 2006)
1	Headquarters-PNP	103	25	128
2	Demining Unit1	310	20	330
3	Demining Unit2	718	44	762
4	Demining Unit3	453	27	480
5	Demining Unit4	258	13	271
6	Demining Unit6	244	20	264
7	Eastern Regional Office	24	10	34
8	Training Center	40	20	60
9	R&D Project	25	11	36
		2,175	190	2,365

The number of staff was slightly fluctuated from month to month throughout the year starting from 2,264 staff in January to 2,401 staff in August 2006.

##### 2.4.4.2. Staff Re-structure

In 2006, CMAC re-structured their resources, staff, to fit with the requirement of demining environment in Cambodia. In the process of re-structure, fund



availability and the effective and efficient use of those limited fund were taken into consideration in order to minimize the productivity cost.

- Re-arranged staff and their positions to meet with teams restructuring and operation requirement, including re-arranged staff and position of one (1) demobilized site in Demining Unit 6 to 3 Mobile Platoons, converted staff of 14 CMT and 4 MRT teams to 13 CMC (Community Mine Clearance Teams) and restructured MAT to become MRE (Mine Risk Education and Reduction Team),
- Re-arranged staff of 4 demobilized Mobile Platoons to fill up the vacancies post of other Mobile Platoons, especially platoons operated in bilateral projects,
- In the purpose of reducing the administration cost, Demining Unit 5 was demobilized, and the teams operated in Pursat were controlled and managed by Demining Unit 2,
- Re-arranged staff and position to support the establishment of EOD Eastern Regional Office in order to support ERW clearance activities at eastern part of Cambodia, in which explosive remnants of war were highly affected,
- Established 4 Community-Based Demining Teams including one CBD team for Grass-root Project in Preah Vihear Province, 2 CBD teams for JMAS Project in Battambang Province and one CBD team for AusCARE Project in Banteay Meanchey,

#### 2.4.4.3. Staff Termination and Death

- In 2006, 106 staff were terminated from CMAC due to different reasons including 41 staff abandoned their post, 32 staff resigned, 3 staff were dismissed through disciplinary action, 12 staff became disable people (8 staff fell in Chronic illness and 4 staff were injured by mine/UXO incident), 4 staff retired and 14 staff were terminated due to the completion of the projects,
- 13 staff died in 2006 as results of traffic accident (one staff), suicide (one staff) and illness (11 staff). However, no staff died by mine and UXO incident in 2006.
- CMAC provided financial support to staff who are retired, disabled and died in accordance with CMAC's Human Resources Policy and Procedures. In 2006, CMAC paid total amount of US\$ 47,941 to support those staff.

#### 2.4.4.4. Staff Training and Motivation

CMAC stresses the importance of staff capacity building, professionalism and disciplines as key human resource management and development strategies. 62 courses were conducted throughout the year with 911 trainees. In term of staff quantity, 738 staffs were trained in 2006 including 585 staffs trained by CMAC, 149 staffs trained by external



partners and 4 staffs sent for oversea training. As nature of re-fresher training course or several courses per subject, one staff was able to participate more than one course per year.

The detail courses and trainees information was presented below.

- Coordinated with Demining Units and collaborated with Training Center to conduct 48 courses for 753 trainees from various Demining Units,
- Coordinated and facilitated with education centers and organizations to conduct final MDD Workshop, Human Resources Management and Field Epidemiology for Mine Action for 24 trainees from various Demining Units and Headquarter,
- Coordinated and facilitated with US 1st Bn, 1st SFG(A) to conduct training courses on mine field management, advanced Trauma Care, wheel vehicle and logistics management and advanced EOD for 128 trainees from various Demining Units especially from Demining Unit 3, which is fund supported by the US Government,
- Sent staff to attend 4 International Training Courses on information management for mine action in Geneva, Switzerland and mine action senior manager course in Virginia, US (6 trainees).
- Coordinated with 61 new graduate students to apply their knowledge and practices on various areas including human resources, administration, finance, GIS and computer networks. In addition to this, one Canadian volunteer was approved to contribute her efforts and shares experiences in the field of Public Relation,

There are different ways to motivate staff. To provide a chance to get training is one of motivation opportunities for CMAC's staff. In 2006, there are 26 staffs were promoted by increasing the salary scale, 13 staffs were allowed to take leave without pay and one staff got maternity leave. 58 SSA staffs were changed to permanent staff and/or from one position to another similar position. 111 staffs were promoted to a higher rank.



#### 2.4.4.5. Personnel Database

CMAC in collaboration with system developer supported by JICA Technical Advisor, has developed a Personnel Database System including the establishment of position code, sub-location and main location for human resources management. The system is expected to be implemented at the end of the year 2007.

## 2.5 Operational Overview

### 2.5.1 Integrated Work Plan 2006

In 2006, CMAC planned to clear a total area of 22,347,500 m<sup>2</sup>. Of these approximately 252 sites would be cleared for large scale development. These included 45 sites for

resettlement, 48 for resettlement and agriculture, 86 for agriculture, 44 sites for rural roads (equivalent to 78,089 m of road), and the remaining for water canals/irrigation, schools, water ponds, pagodas and others. This clearance activity was expected to benefit 173 villages which were located in the high casualty areas. In other terms, this clearance effort would benefit 3,836 families directly, 25,806 families indirectly, and a total of 2,365 school children. Approximately 154,551 people were expected to benefit from CMAC demining operations in 2006. In addition to these, CMAC planned to release landmine/UXO threats from approximately 300 small-scale development sites treated as risk reduction tasks. This would be equivalent to approximately 3,608,000 m<sup>2</sup> of high casualty areas. At the same time, CMAC planned to collect and destroy approximately 123,500 UXO.

### 2.5.2 Clearance Progress

As a leading demining organization in Cambodia, CMAC continues to make every effort to increase its demining productivity to release as much land as possible back to productive use by the communities. From 1992 to December 2006 CMAC achieved the following operation outputs:

- Number of minefields cleared: 3,263
- Cleared 172,048,889 m<sup>2</sup> of contaminated land
- Area reduction achieved: 22,254.98 ha
- Found and destroyed 346,796 anti-personnel mines
- Found and destroyed 6,573 anti-tank mines.
- Found and destroyed 1,141,172 UXO's,
- Found 31,536 kg of small calibers, and
- Unearthed 358,161,994 fragments.

In respect to the clearance in 2006 CMAC achieved as follows:

- Number of minefields cleared: 585.
- Cleared 26,772,625 m<sup>2</sup> of contaminated land.
- Area reduction achieved: 16,963.98 ha.
- Found and destroyed 35,806 anti-personnel mines.
- Found and destroyed 1,000 anti-tank mines.
- Found and destroyed 113,296 UXOs,
- Found 5,236 kg of small calibers, and
- Unearthed 26,109,554 fragments.

It is important to note that in addition to the above progress CMAC also made remarkable accomplishments and produced significant tangible and intangible outputs in other areas such as mine risk education, minefield information/survey, training and research and development in mine action.

#### Mine/UXO Risk Education Activities:

Activities	Achievements
Number of villages reached	3,648
Number of sessions delivered	3,598
Households visited	64,173
Total number of people attending mine risk education	275,118

It is also worthwhile to note that in 2005 the productivity reached just over 22 km<sup>2</sup> for twelve months. In 2006, the total productivity for a twelve-month period reached nearly 27 km<sup>2</sup>. This productivity increase is a significant achievement to be remarked after a series of reforms and restructuring in CMAC's operations and management. The explanation for the significant increase in productivity includes sound corporate and operational management, effective use and integration of toolboxes, effective minefield management and increased use of mechanical system such as brush cutters.

However, with respect to the increase in the clearance targets, it is very important to note that the actual achievements of the targets on the grounds depend on a variety of factors. The weather conditions, terrain, and other disruptions may be the affecting factors in this respect.

### **2.5.3 Demobilization of DU 5 and Establishment of ERO**

Thanks to the improvement of road infrastructure in the western part of Cambodia, CMAC identified an opportunity to save costs by demobilizing Demining Unit 5 Head Office based in Pursat. Subsequent to this mobilization, teams operating in Pursat were placed under the management and control of Demining Unit 2 in Battambang. This cost-saving exercise was part of CMAC's constant effort to improve cost-efficiency and respond to the changing requirements and situations on the ground.

At the same time, on 10 January 2006, a new Eastern EOD Regional Office (ERO) was established to be a central point of UXO clearance and risk education activities in Kampong Cham province. This Office was established to manage and supervise ERW activities in eastern provinces such as Kampong Cham, Prey Veng, Svay Rieng, Kratie, Stung Treng, Mondul Kiri and Ratanak Kiri to respond to the community requirements for response to explosive remnant of wars in these areas. As the economic and development activities are starting to take roots in these provinces, including mineral exploration, it is expected that the economic and demographic boom in the area will increase the level of threats posed by the presence of ERW's in the areas.

### **2.5.4 Establishment of MRER and CMC Teams**

Another aspect worth mentioning is the conversion of the former mine awareness teams, which delivered pure mine awareness education, to be mine/UXO risk education and reduction (MRE) teams. The MRE team is a multi-skill team which carries out risk education as well as risk reduction by disposing of UXO as they collect from the communities they visit. CMAC's partners, including UNICEF, HIB, Austcare and NPA, have contributed a great support to this effort. The key principles behind establishing these MRE teams are flexibility, responsiveness and reliability. This means that these teams do not only talk (provide awareness education), but they also do the action (collect and destroy UXO).

In an effort to increase the efficiency and effectiveness to provide quick response to the requests for risk reduction and small scale development by the affected communities, in 2005 CMAC took a bold initiative to reform its operational teams by conducting trial of a new team structure called Community Mine Clearance (CMC) Team. The purpose was to design an appropriate and reasonable team structure to replace the Community Mine Marking Teams (CMT) and Mine Risk Reduction Teams (MRT), taking into account past experience, nature of problems and tasks, mobility, appropriateness of team structure, and other factors. The trial proved that the new

concept was appropriate, more efficient and more responsive, and therefore recommended the establishment of the CMC teams to replace the CMT and MRT teams.

A CMC Team consists of 9 people: 1 Team Leader, 1 Senior Member and 7 Members. The task of the CMC team is to conduct small scale clearance of land up to one hectare (10,000 m<sup>2</sup>) to provide risk reduction and support development. These Teams clear minefields identified, prioritized and selected by PMAC/MAPU, put up long term marking, as well as respond to the risk reduction tasks requested by the communities on an emergency basis.

Through one year of operations on the ground, CMAC realizes that the CMC concept is very effective and efficient in terms of deployment and flexibility response. The CMC teams are also trained in UXO search and demolition and are equipped with UXO detectors. So, in addition to clearing minefields, these teams are also capable of clearing UXO fields. In addition to the multi-skills, the CMC team structure allows great flexibility and efficiency in small scale and rapid deployment, therefore they are very much appreciated by donors and partners for their quick response.

### 2.5.5 ERW Risk Reduction

The explosives remnants of wars scattered virtually everywhere in the country after the three-decade long conflicts and heavy US bombing continue to pose fatal threats to millions of civilian population. The evidence of the magnitude of the ERW problem lies with the high casualty rate that Cambodia suffers from. The attractive shape and scrap metal trade for scarce cash makes these ERW one of the most dangerous killers in post-war Cambodia. Furthermore, with the expanding economic and commercial activities as a result of road links and mining contracts in the eastern provinces, it is expected that the response to the ERW problem needs to be increased.

Due to this emerging demand, CMAC plans to expand its EOD capacity in the eastern provinces to respond to the growing economic and development activities in the areas. EOD skill is yet another challenge since this is a very highly technical field compared to landmine clearance and disposal. With this challenge in mind, CMAC has made every effort to strengthen its EOD capacity through training, on-the-job training, exchange of experience and publication of EOD Handbook.

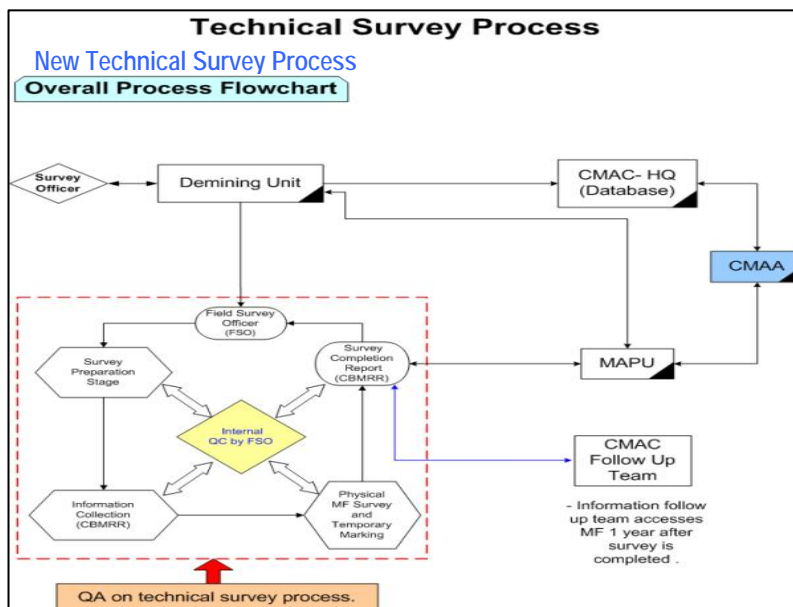
Similarly, the recent ERW Study conducted by CMAA and NPA with the financial support by the US State Department stresses the importance of the increased EOD response and the important role of CMAC in the long term EOD operations, in conjunction with other key players such as the National Police and the Armed Forces. This study has become the basis for the National EOD Strategic Plan, which recognizes CMAC as a long term key player in EOD operations. The Plan also calls for the establishment of the Centre of Excellence for EOD, and the existing CMAC's Training Centre is expected to be utilized for this purpose.

Today, as CMAC strives very hard to take every effective measure to respond to the UXO problem, EOD tasks no longer solely belong to the EOD teams. Even though the EOD teams still play the main role in the EOD response, other teams such as CMC and MRE teams also play a very important role in this field of operations. Following a series of reforms and improvements, the CMC and MRE teams have been equipped with skills and EOD gears to perform UXO search and demolition activities. Their multi-skills and tasks have significantly strengthened CMAC's capability and flexibility to respond

to different EOD task nature, requirements and size. CMAC also trained 4 explosive detection dogs (EDD) in 2006. The training shows very positive results and big operational potential for the EDD, and they are due to be trialed in real UXO fields in 2007. In addition to these teams, the local UXO network, known as Community-Based UXO Risk Reduction (CBURR), also plays a very important role as the local network to facilitate information flow and UXO risk education. The CBURR networks have played a very important role in ensuring that the communities have a strong residual capacity to collect and pass on mine/UXO information, provide UXO risk education, and support UXO risk reduction and community development planning. Strengthening the local police to be the UXO focal point is also an effective strategy to involve the local communities and authorities to tackle the UXO problem. In this respect, CMAC has provided training to hundreds of police officers from high impact and high casualty districts identified through the CMVIS casualty reports.

### 2.5.6 Technical Survey: The New Concept

The primary aim of CMAC's technical survey is to collect and verify landmine and UXO contamination information to quickly and reliably identify and classify the contaminated areas, level of risks and to enable the clearance requirements to be more clearly defined. CMAC has been implementing technical survey since 2002, and the concept of CMAC's technical survey has evolved ever since. Through experience and practice in the field, and to respond to the national strategy of accelerated area reduction, CMAC has sought different measures to improve its technical survey capability and efficiency in order to identify the real threats and release non threat and low threat areas.



In order to speed up technical survey information collection, CMAC redefined its technical survey concept and process in late 2006. In this new concept, technical survey utilizes the community-based mine risk reduction network members as the moderator of information by using all existing sources of information within their community and by coordinating with key informants as well as the local authorities to ensure that the obtained information is verifiable and reliable. While the new concept of technical survey involves a lot of inputs from the local authorities and the CBMRR, its outputs (mine/UXO contamination maps) are distributed more widely to the village authorities, PMAC/MAPU and CMAA for planning and prioritization purposes. Land released through this process can also be removed from the contamination map in the national database.

CMAC technical survey is designed to produce three main outputs. Firstly, it aims to provide a sustainable mine action information tool at the community level by providing

appropriate training to the Community-Based Mine Risk Reduction (CBMRR) members and their volunteers on how to regularly and systematically update the landmine and UXO problem within their community on a provided map. A similar training is also provided to the Provincial Mine Action Committee (PMAC) members for the same purpose - updating and using the map for the planning and prioritization purpose. This effort can naturally strengthen the communication and cooperation between the affected community (CBMRR) and local authority (PMAC) for both prioritization and planning processes. Secondly, the technical survey defines a new road map for the affected community by identifying the real threat of landmines and UXO and classifying the level of threats and technical requirements for subsequent clearance operations. Thirdly, this effort frequently reduces a significant size of suspected landmine and UXO areas previously identified by the Impact Survey. The released areas, through the process called area reduction, can be recorded and mapped in a systematic and professional manner.

In 2006, CMAC's technical survey teams achieved a total of 16,963.98 ha of area reduction from the Level One Survey records of suspected areas. In addition, they found a contaminated area of 9,097.11 ha outside the Level One Survey.

### **2.5.7 The Mine and Explosive Detection Dogs (MDD and EDD)**

Mine Detection Dog has become one of the most important and effective demining tools in the recent years, and many demining organizations are becoming more and more confident in utilizing dogs to support demining activities. CMAC has established and sustained an effective operational MDD program, and has extended this service to MAG to support MAG's demining operations in Cambodia.

In 2005, CMAC established the long-leash dogs in addition to the existing short leash dogs in order to diversify the search patterns to respond to different types of terrain and minefield conditions. Two new teams became operational in 2006, increasing the total number of teams to 4.

The indication of effectiveness and efficiency is highlighted by MAG's continued and increased utilization of CMAC's MDD. In 2006, MAG hired a third team from CMAC to support their operations. Their productivity significantly increased with the use of these dogs.

CMAC has a clear vision to expand and strengthen its capacity in the field of ERW in the coming years. As part of this commitment, CMAC has recently initiated to develop the new concept of Unexploded Ordinance Detection Dog (EDD), which will become another essential tool for UXO clearance operations. The current CMAC's EOD capacity has been focusing on collecting UXO on the ground mostly reported by the police and the communities. However, today there is a greater demand for underground UXO clearance for subsequent use of these UXO affected areas for economic and rehabilitation activities. CMAC's EDD has been developed and trained with the dedicated support by the Norwegian People's Aid (NPA) and its MDD Training Centre in Bosnia (the GTC). In 2006, CMAC started to train 4 explosive detection dogs (EDD) to further speed up the ERW clearance operations. CMAC plans to trial and put these dogs into operations in 2007 to evaluate their performance in the UXO fields. Once the EDD teams are fully operational, it is expected that they will contribute significantly to speed up the effort to clear UXO, which still lie in millions scattered underground across Cambodia and pose formidable threats to Cambodians. They will make joint efforts with the EOD, MRE and CMC teams to clear UXO fields.

### 2.5.8 Linking Mine Action and Development

CMAC has a long experience and can be considered a good model organization to link mine action and development. In order words, CMAC places a great attention on the post-clearance development of areas which have been cleared. This is processed, managed and monitored through its Socio-Economics Branch and Sections, and socio-economic impacts and beneficiaries are crucially considered in CMAC's Integrated Work Plans.

In 1999, CMAC introduced the concept of the Land Use Planning Unit (LUPU) and established the Socio-Economics Sections at the Demining Units and the Headquarters. The purpose was to decentralize minefield selection to the local and provincial authorities to enable and empower them as well as development organizations and partners to secure a fair and transparent mine clearance planning process to ensure the proper use of land cleared for humanitarian and development purposes. The LUPU was an ad hoc provincial body created by a provincial sub-decree and placed under the authority of the Provincial Rural Development Committee (PSC) and the provincial sub-committee on the use of land in mine areas. In September 2000, a sub-decree of the Royal Government of Cambodia (RGC) established Cambodian Mine Action and Victim Assistance Authority (CMAA), and the LUPU mechanism was revised to become the Provincial Mine Action Committee (PMAC), and the Land Use Planning Unit (LUPU) became the Mine Action Planning Unit (MAPU). Today, CMAC strictly follows the PMAC/MAPU process in minefield prioritization and selection for clearance. Through this process, socio-economics of mine action is key and land to be cleared is targeted for subsequent development.

CMAC also has long experience working with development partners such as Austcare, CARE International, NPA, Peace Boat, Rotary Club, and ZOA. In addition to clearance support, these organizations provide development support to the mined communities to re-activate their livelihood, improve their living conditions, enhance their social integration and raise their esteem and value. These activities have contributed enormously to the Royal Government's effort to poverty reduction and eradication.

### 2.5.9 Research and Development Activities

The challenges in mine action in Cambodia and worldwide require CMAC to maintain competitive advantages through improved technology and methodology. As highlighted in the section on how technology can assist in mine action, CMAC has long experience with using machines to assist demining activities. In this respect, CMAC recognizes the importance to acquire and maintain a residual mechanical demining capacity through quality training and research and development activities. Today in the changing and competitive mine action environment, CMAC regards research and development as a very important component in its mine action.

In 2006, CMAC carried out a number of research and development projects including the continued Explosive Harvesting program supported by the US Government, the Project for Research and Development of Mine Clearance Related Equipment supported by the Government of Japan, the Sifting Bucket Testing Project, the Magnet Test Project, etc. The Project for Research and Development of Mine Clearance Related Equipment was a major project conducted in the reporting period, bringing 3 demining machines, 3 GPR mine detectors and 1 buggy for detector mounting.



In addition, CMAC has also established high standard and quality test facilities in Siem Reap and in Kampong Chhnang, able to house test and evaluation of mines and UXO detectors of various types and depths (up to 12 metres deep). The construction of these test facilities were supported by the Japanese and US Government. These test facilities will be able to house and accommodate any types of tests. In addition to the facilities, CMAC also upgraded the skills and experience of its staff to plan, manage, and carry out quality test and evaluation of mine clearance related equipment.

#### 2.5.10 Center for Training and Research & Development in Mine Action and Explosive Remnants of War

This newly constructed centre lies on the twelve-hectare plot of land about 20 km from Siem Reap town on the National Road 6. This centre houses the regional demining unit headquarters, training, research and development facilities, and a landmine and ERW showroom, which will eventually become the landmine and ERW museum in the future.

Once all facilities are completed and the centre is operational, which is expected to happen in 2007, this centre will become the hub of mine action in Cambodia: headquarters for demining operations, training and R&D centre, and landmine and ERW showroom to promote landmine and ERW awareness and risk education. It is also expected that by opening this showroom to the public, especially foreign tourists,



Demining Unit 4 Headquarters in Siem Reap

the centre will enhance their awareness of the landmines and ERW problem in Cambodia, thus making contributions to the efforts of addressing this problem.

As for the R&D facilities, CMAC will use this centre to promote the research and development of all landmine/UXO clearance related equipment. This will be realized through the conduct of test and evaluation of mine/ERW clearance related equipment. CMAC constructed very professional test lanes for mine detectors, both handheld and vehicular, which have already been used to test mine detectors developed and manufactured by Japanese companies and research institutions. CMAC will open this test facility to other research and development organizations which want to test and evaluate their equipment.

## OPERATIONAL ACHIEVEMENTS

### 1. OPERATIONAL DEPLOYMENT

In 2006, there were a number of changes in the operational strength. Two mobile platoons (104 and 123) were demobilized on 13th January 2006, and three normal platoons (35, 37 and 38) of site 4 in DU6 were converted into 3 mobile platoons (142, 143 and 144) on 17th January 2006. Some mobile teams were also transformed, and as a result, new teams were born. For instance, the CMT teams (Community Mine Marking Teams) and MRT teams (Mine Risk Reduction Teams) were demobilized and completely converted into the Community Mine Clearance Teams (CMC) in early January 2006, and 6 MAT teams (Mine Awareness Teams) were reformed into the Mine Risk Education and Reduction Teams (MRE) at the end of January. The purpose of the transformation of these teams was to respond to the changing field requirements, the nature of tasks, and the increasing demand for multi-skills and flexibility. The changes also aimed to gain more efficiency and effectiveness in responding and intervention to the urgent tasks on time to the community needs as required. The concept and process of the technical survey was also modified to meet the increasing demand for accelerated area reduction and technical survey process. The following table shows the number of teams deployed throughout the reporting year.

N.	MINE ACTION TEAMS	Number of Teams Deployed in 2006											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Demining site	1	1	1	1	1	1	1	1	1	1	1	1
2	Normal Demining Platoon (NP)	3	3	3	3	3	3	3	3	3	3	3	3
3	Mobile Demining Platoon (MP)	38	38	38	38	38	38	38	38	36	36	36	36
4	Explosive Ordnance Disposal Team (EOD)	21	21	21	21	21	21	21	21	21	21	21	21
5	Technical Survey Team-Small (TST-small)	19	19	19	19	19	19	19	19	19	19	19	19
6	Community Mine Clearance Team (CMC)	13	13	13	13	13	13	13	13	13	13	13	13
7	Mine Risk Education and Reduction Team (MRE)	6	6	6	6	6	6	6	6	6	6	6	6
8	Community-Based Mine Risk Reduction (CBMRR)	23	23	23	23	23	23	23	23	23	23	23	23
9	Community-Based UXO Risk Reduction (CBURR)	13	13	13	13	13	13	13	16	16	16	16	16
10	Short Leash Mine Detection Dog Team (SLD)	10	10	10	10	10	10	10	10	10	10	10	10
11	Long Leash Mine Detection Dog (LLD)	2	2	2	2	2	2	2	4	4	4	4	4
12	Mechanical Brush Cutter (BC)	26	26	25	25	25	25	25	25	25	25	25	25
13	Technical Survey Team-Large (Large-TST)	4	4	4	4	4	4	4	4	4	4	4	4
14	Community-Based Demining Platoon (CBD)	1	2	2	2	2	2	2	5	5	5	5	5

### 2. PROJECT MANAGEMENT

CMAC's management of mine action activities has taken the form of projects. This is because of the nature of funding, timeframe and specific activities the funding is earmarked for. In this respect, project management has become the core emphasis, and cost efficiency has been the centre of the talk.

There are three types of funding channeled to CMAC: multi-donor funding through the UNDP to support the Project “Clearing for Results”, the direct single-donor funding to CMAC through Bilateral Projects for humanitarian demining, and direct contracts with private companies through the Contractual Service Unit. All funding (through all channels) to CMAC is earmarked for the agreed specific activities within a specific timeframe. It is therefore very important to manage the projects effectively considering the differences in reporting formats and requirements, audits, human resources and logistics. The following projects were implemented in 2006:

PROJECT TITLE	DONOR/PARTNER	PROJECT LOCATIONS
The Integrated Demining and Development Program	Netherlands/NPA Cambodia	DU1, Banteay Meanchey
Integrated Mine Action and Development Program	Australia/Austcare	DU1, Banteay Menchey
The Project for Supporting Humanitarian Demining Activities in Battambang Province	Grassroots-Japan	DU2, Battambang
The Community-Based Demining (CBD)	Japan/JMAS	DU2-Battambang
Humanitarian Mine Action Project	USA	DU3, Pailin and Samlot (Battambang)
The Project for Supporting Humanitarian Demining Activities in the Provinces of Kampong Thom, Oddar Meanchey and Preah Vihear	Grassroots-Japan	DU4, Kampong Thom, Preah Vihear and Oddar Meanchey
Mine/UXO Clearance for Access Road from Koh Ker to Kampich Village	Peace Boat, Japan	DU4, Preah Vihear
Humanitarian Demining	Germany	DU6, Siem Reap & Oddor Meanchey
The Research and Development of Mine Clearance related to Equipment	Japan/JICS	Siem Reap/Battambang
UXO Clearance Activities and CBURR Project	Japan/JMAS	Prey Veng, Svay Rieng & Kandal
UXO Clearance Activities and CBURR Project	Japan/JMAS	Kg. Speu, Kampong Cham, Prey Veng, Svay Rieng & Kandal
Graduate Exchange/Internship Program	NPA	CMAC HQ and Training Centre (Kg. Chhnang)
Explosive Harvesting Program (EHP)	USA/Golden West	CMAC Training Center (Kg. Chhnang)
Provision of MDD and Technical Assistance	NPA/GTC-Bosnia	CMAC Training Centre (Kg. Chhnang)

#### CONTRACTUAL SERVICE UNIT:

PROJECT TITLE	DONOR/PARTNER	PROJECT LOCATIONS
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Battambang and MAG targeted zone
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Samlot, Ratanak Mondul, (Battambang) and Pailin
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Preah Vihear and MAG targeted zone
SEA-UNION CONSTRUCTION (Cambodia) Co. Ltd	Private Company	HQ-Phnom Penh
Liberty Mining International (LMI) Pty Ltd	LMI	Ratanakiri province
The Cambodian Airport Management Service	Phnom Penh Airport	HQ-Phnom Penh

The involvement of UNDP with mine action and with CMAC in particular occurred since the UNTAC era after the emergency phase in 1992-3 when the United Nations Secretary General requested UNDP to assist the Royal Government in the administration of the demining program in Cambodia as set out in its agreements. Today, UNDP is still committed to continue to work towards fulfilling the mandate set by the Government of Cambodia to achieve the ninth goal of the Millennium

Development Goals. UNDP was CMAC's primary source of funding, approximately 5 to 6 million dollars through the Trust Fund, for several years until the mine action funding environment changed toward a more bilateral mode in the recent years. As a result, financial contributions channeled to CMAC through the UNDP Trust Fund decreased considerably.

Until 31 December 2005, the UNDP managed a multilateral funding mechanism in the form of a Trust Fund, which gave CMAC greater flexibility in supporting different elements of its operations in addition to clearance. As the Trust Fund came to conclusion on 31 December 2005, in a new approach to mine action UNDP has signed with the Royal Government a new Two-Phased Project Document whereby the first phase allows UNDP to directly give mobilized fund, attached with specific input/output conditions under the project called "Clearing for Results", to CMAC to support its demining activities. The second phase, when practical, would call for open bidding by all qualified operators for mine action fund that UNDP mobilizes from donors. In 2006, UNDP supported CMAC with a total amount of 3.45 million USD, the fund coming from major donors such as Australia, Canada and UNA-USA's Adopt-A-Minefield. Other bilateral funding, in the form of bilateral projects, continues to play a vital role in supporting CMAC's demining program and has contributed a significant portion to the total funding to CMAC. Bilateral projects are implemented and managed by CMAC directly with the donors. External audits are conducted at the end of each project, which usually last for 12 months. However, the timeframe of each project may vary from each other depending on the donor's fiscal year.

### 3. ALLOCATION OF MINE ACTION TEAMS

In accordance with the high priorities determined by the Royal Government through the MAPU/PMAC process, and to support the community development activities implemented by development agencies, CMAC has been concentrating its mine action efforts in the high priority areas to conduct full clearance of landmine areas in order to reduce potential mine/UXO casualties and support development efforts. In response to the high casualty rate and active economic and development activities in the areas, most of CMAC's operational clearance teams were deployed in the north-western provinces where mine clearance is most needed. Intervention teams, especially the EOD, were deployed in both western and eastern provinces where UXO still causes a severe impact on the people. The table below illustrates the team deployment as of November 2006.

Demining Unit (DU) /Locations	Mine Action Teams													
	SITE	NP	MP	EOD	TST-Small	CMC	TST-Large	MDD-SL	MDD-LL	BC	CBD	MRE	CBMRR	CBURR
DU#1(Banteay Meanchey)			5	3	4	3		1	2	5	1	1	5	
DU#2(Battambang and Pursat)			12	2	7	5	2	4	2	11	3	2	13	
DU#3 (Pailin and Samlot district)			10	2	4	2	2	3		4		1	5	
DU#4 (Kg. Thom, Preah Vihear, Oddar Meanchey)			6	2	2			2		3	1			
DU#6 (Siem Reap & Oddar Meanchey)	1	3	3	2	2	1				2		1		
CMAC HQ (Phnom Penh)				5		1								8



Eastern EOD Regional Office (ERO)				5		1						1		8
Total teams deployed in 2006	1	3	36	21	19	13	4	10	4	25	5	6	23	16

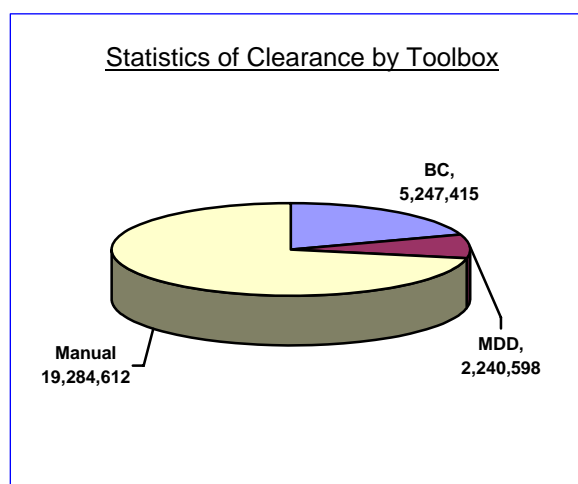
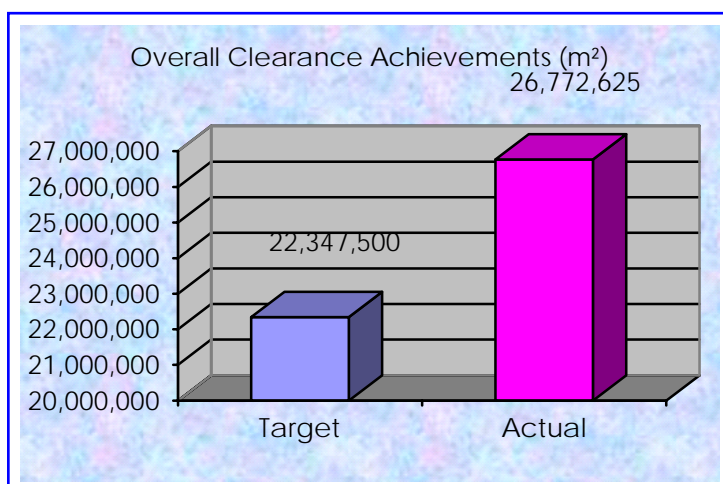
#### 4. SUMMARY OPERATIONAL ACHIEVEMENTS

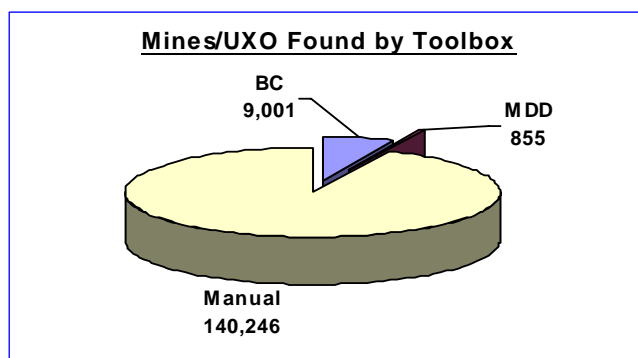
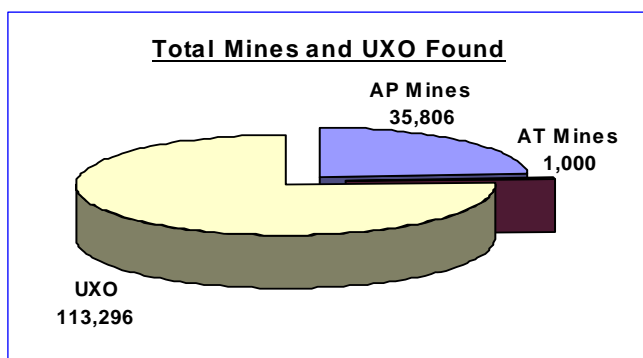
With continuous efforts and commitment to safety, high productivity and efficiency, like the previous year, in 2006 CMAC made a remarkable progress in its demining operations aimed to meet the zero-victim vision of the Royal Government of Cambodia. The following tables illustrate a summary of the mine/UXO clearance outputs for the reporting year.

##### 4.1 OVERALL DEMINING ACHIEVEMENTS

Description	Actual	IWP Target in 2006	Percentage (%)
<b>Clearance and Marking:</b>			
Total area cleared – m <sup>2</sup>	26,772,625	22,347,500	119.80
Total number of minefields cleared	585		
Minefields marked in linear meters – m	2,032,983	1,860,000	109.30
Vegetation clearance by brush cutters – m <sup>2</sup>	8,409,575	7,550,000	111.38
Excavation of the beam soil by brush cutters – m <sup>3</sup>	119,563		
Found and destroyed:			
- AP mines	35,806		
- AT mines	1,000		
- UXO	113,296		
- Small Calibers – kgs	5,236		
Fragments unearthed (pieces)	26,109,554		
Number of tasks responded by EOD & MRE teams	9,379		
<b>Technical Survey:</b>			
Number of villages surveyed	59		
Total area in Level One Survey (L1S) – ha	22,005.44		
Total area reduction from L1S – ha	16,963.98		
Contaminated area found outside L1S – ha	9,097.11		
Total contaminated area after TS – ha	14,138.57		
Confirmed minefields – m <sup>2</sup>	10,740.70		
Suspected minefields – m <sup>2</sup>	1,368.50		
Residual minefields – m <sup>2</sup>	2,048.60		

#### Charts of Overall Demining Achievements





#### 4.2 MARKING ACHIEVEMENTS

Status of Minefield	Achievement		
	Completion	Long Term Marking	Short Term Marking
Total number of minefields cleared	585		
Minefields verified and marked by small and large TST		293	513
• Confirmed Minefields		198	289
• Residual Minefields		36	116
• Suspected Minefields		59	108

#### 4.3 OVERALL OPERATIONAL ACHIEVEMENTS BY PROJECT

Name of Projects	ACHIEVEMENTS										
	Area Cleared (m <sup>2</sup> )	Vegetation Cutting (m <sup>2</sup> )	Excavated (m <sup>3</sup> )	Marked (m)	Area Reduction (ha)	AP Mines	AT Mines	UXO	Small Calibers (Kgs)	EOD Tasks	Fragment
UNDP	8,201,334	3,158,841	47,822	934,118	5,489.52	9,902	190	30,667	1,117	1,583	6,811,088
NPA	1,795,336	554,473	25,029	191,973	-	9,079	281	9,559	1,079	754	3,062,293
GRT-DU2	3,733,743	1,284,999	2,328	94,106	-	5,545	328	13,255	535	824	2,880,909
USA-DU3	4,900,725	1,334,211	38,305	641,949	11,455.33	7,066	61	9,978	468	1,318	8,766,695
GRT-DU4	4,181,272	996,237	4,129	108,249	-	696	20	8,790	758	988	2,927,913
JPN-JMAS	214,982	-	-	-	-	1,031	64	31,155	755	2,993	386,916
GMN-DU6	3,093,891	1,080,814	1,950	43,926	-	1,848	48	8,195	520	737	853,867
AUSTCARE	441,519	-	-	18,662	-	419	6	154	-	-	396,614
Peace Boat	196,168	-	-	-	-	10	-	11	-	-	23,259
UNICEF	13,655	-	-	-	-	210	2	1,532	4	182	-
<b>TOTAL:</b>	<b>26,772,625</b>	<b>8,409,575</b>	<b>119,563</b>	<b>2,032,983</b>	<b>16,944.85</b>	<b>35,806</b>	<b>1,000</b>	<b>113,296</b>	<b>5,236</b>	<b>9,379</b>	<b>26,109,554</b>

#### 4.4 MINE RISK EDUCATION ACHIEVEMENTS

Activities	Achievements
Number of villages reached	3,648
Number of sessions delivered	3,598
Households visited	64,173
Total number of people attending mine risk education	275,118

## 5. ACHIEVEMENTS BY CORE ACTIVITY

### 5.1 MINE/UXO RISK EDUCATION AND REDUCTION

CMAC realizes that an effective MRE is based upon careful and ongoing assessment of the needs of the affected communities with involvement of existing community structures and local authorities in prioritizing tasks for mine action programs. The planning of MRE should be linked to demining, victim assistance and community development program planning. Based on this guiding principle, CMAC long-term strategy for mine/UXO risk education is to gradually transfer skills and knowledge to the local communities. The CBMRR and CBURR programs are proof of translating this concept into practice, whereby the affected communities are empowered to recognize, manage and address the mine/UXO problem on their own terms, through task identification and prioritization, with the support from the demining operators and development partners through the PMAC/MAPU process.

In this respect, CMAC has always encouraged and provided capacity building to the communities to be more active in addressing their community issues related to the landmines and UXO so that this exercise will eventually be taken over by the communities themselves. This proactive effort requires expanded community roles, commitment and experience, and this can be achieved through strengthening their capacity in both technical knowledge and means of communication with mine action operators and development partners. Through such an exercise, a sustainable residual mine and UXO risk reduction capacity can be established, which becomes the backbone resource to realize the Royal Government's vision of zero victims and zero impact.

The significant drop (by around 50%) in the number of casualties in 2006 is a positive sign of impact delivered by mine action efforts and deserves praise. There are several factors which can explain this phenomenon. In a larger context, law enforcement by the authorities, for instance on scrap metal business and land grabbing, is the legal factor which has delivered a positive result. Good coordination and effective control mechanism at the provincial and grassroots levels also help. Mine/UXO action response and clearance capacity delivered by all operators is another contributing factor. In general, collective efforts and combined factors have contributed to the sharp drop in casualties. On CMAC's part in a narrower context, a multi-tool approach to mine/UXO risk education and reduction has been applied. It is undeniable that the MRE teams (once mine awareness teams), CMBRR and CBURR are making a positive impact on the communities in terms of risk reduction, risk education, community integrated planning, and internal capacity of the communities to address landmines and UXO threats. However, from the multi-tool perspective, CMAC no longer sees the above MRE tools as the only applicable risk education and reduction tools. Though the MRE teams, CBMRR and CBURR still remain the principal players in mine/UXO risk education and reduction, CMAC



also utilizes other tools such as EOD and CMC in the risk reduction efforts. These teams have been trained, equipped and tasked to perform risk reduction duties including quick responses, interventions, and delivery of awareness education to the affected communities. In addition, the local authorities, such as village chiefs and the police, also play an indispensable role in this area.

In respect to the UXO issue, CMAC's CBURR networks have played a very important role in ensuring that the communities have a strong residual capacity to collect and pass on mine/UXO information, provide UXO risk education, and support UXO risk reduction and community development planning. Strengthening the local police to be the UXO focal point is also an effective strategy to involve the local communities and authorities to tackle the UXO problem. In this respect, CMAC has provided training to hundreds of police officers from high impact and high casualty districts identified through the CMVIS casualty reports.

The conversion of the former mine awareness teams, which delivered pure mine awareness education, to be mine/UXO risk education and reduction (MRE) teams has yielded very positive results. The MRE team is multi-skilled and carries out risk education as well as risk reduction by disposing of UXO as they collect from the communities they visit. CMAC's partners, including UNICEF, HIB, Austcare and NPA, have contributed a great support to this effort. The key principles behind establishing these MRE teams are flexibility, responsiveness and reliability. This means that these teams do not only talk (provide awareness education), but they also do the action (collect and destroy UXO).

The scrap metal trade is quite a profitable business and is widespread in Cambodia. Attractive scrap metal prices attract many poor Cambodians to put themselves into a dangerous, sometimes fatal business venture. Many scrap metal dealers do not know about or pay much attention to the danger caused by the UXO they buy and sell. Abundant UXO scattered across the country and their sensitive conditions worsen the situation and make the people extremely vulnerable to risks. As a result, the UXO that people collect for a small income as they sell the metal have taken many lives or put people on the verge of death or injury. Yet, it is not easy to stop this activity. Recognizing this deadly phenomenon, CMAC with the expected support from UNICEF, will launch a pilot project called "UXO Risk Reduction through Scrap Metal Dealers (URSMD)" which aims to educate the villagers and scrap metal dealers about the dangers of the metal they collect and how they can cooperate with CMAC or other operators and authorities to avoid fatal accidents caused by this business.

### 5.1.1 Community-Based Mine Risk Reduction (CBMRR)

#### Resources Deployed:

Community-Based Mine Risk Reduction Program:

- 05 Provincial Coordinators (5 personnel)
- 18 District Focal Points and 1 Assistant (19 personnel)
- 434 Mine/UXO committee representatives or volunteer networks (434 persons)



## 5.1.1.1 Deployment

## A. CBMRR-Provincial Coordinators

Category	Target Province				Total	Donors
	BMC (DU1)	BTB & PST (DU2)	PLN (DU3)	OMC (DU6)		
Provincial Coordinators	1	2	1	1	5	UNDP, UNICEF, NPA & USA
<b>Grand Total</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>5</b>	

## B. CBMRR-District Focal Points

Target Districts	Target Provinces								Donors
	BMC (DU1)		BTB & PST (DU2)		Pailin (DU3)		OMC (DU6)		
	Male	Female	Male	Female	Male	Female	Male	Female	
Pailin					1				USA
Samlout						1			USA
Salakrao & Asst					2				USA & UNICEF
Kamrieng			1						UNDP & UNICEF
Phnom Proek			1						UNDP & UNICEF
Sampovl Loun			1						UNDP & UNICEF
Bavel			1						UNDP & UNICEF
Moung Russei			1						UNDP & UNICEF
Kas Krolor				1					UNDP & UNICEF
Ratanak Mondul			1						UNDP & UNICEF
Veal Veng			1						UNDP & UNICEF
Phnom Krovinh			1						UNDP & UNICEF
Samrong							1		UNDP & UNICEF
Banteay Ampil							1		UNDP & UNICEF
Ou Chrov	1								NPA
Svay Chek	1								NPA
Thmar Pouk	1								NPA
Malai	1								NPA
<b>Grand Total</b>	<b>4</b>		<b>8</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>2</b>		

## C. CBMRR-Mine/UXO Committee Representatives (Volunteer Networks)

Target Districts	District Level		Commune Level		Village Level		Total
	Male	Female	Male	Female	Male	Female	
Pailin	1	1	5	1	8	2	18
Salakrau	2		8		25	9	44
Kamrieng	2		7	3	13	3	28
Sampov Loun	2		4	4	10	2	22
Phnom Proek	2		7	3	16	2	30
Samlout	2		2	2	11	5	22
Bovel	2		4		14	2	22
Moung Reusei	2		6		14		22
Kas Kralor	1	1	5	3	9	3	22
Malai	2		5	1	13	3	24
Rattanak Mondul	1	1	5	1	9	7	24



Ou Chrov	2		6		13	1	22
Thmar Puok	2		4		16		22
Svay Chek	2		4		11	1	18
Veal Veng	2		5	1	8	8	24
Phnom Kravanh	2		6		7	9	24
Samrong	2		3	1	8	8	22
Banteay Ampil	2		3	3	8	8	24
<b>Grand Total</b>	<b>33</b>	<b>03</b>	<b>89</b>	<b>23</b>	<b>212</b>	<b>74</b>	<b>434</b>

**5.1.1.2 Key Activities and Achievements**

**Objective One:**

***To establish an effective and sustainable community-based mine risk reduction network at district, commune and village levels.***

- 25 of 40 new target villages were selected in Ratanak Mondul District of Battambang, Phnom Kravanh and Veal Veng Districts of Pursat, Samrong and Banteay Ampil Districts of Oddar Meanchey province through the PLA processes.
- 125 target village maps were updated, taking account of all main information sources in the PRA village profiles. The updated information was introduced back to the villagers.
- 434 Mine/UXO Committee representatives attended refresher courses twice, organized by District Focal Points based in each target district under supervision and observation by the CBMRR's Provincial Coordinators.
- 09 low priority villages (04 villages in Pailin, 03 villages in Battambang, and 02 villages in Banteay Meanchey) were phased-out, and 14 new high priority villages were selected to replace the phased-out villages. There were 143 target villages in 56 communes in the reporting year.



**Objective Two:**

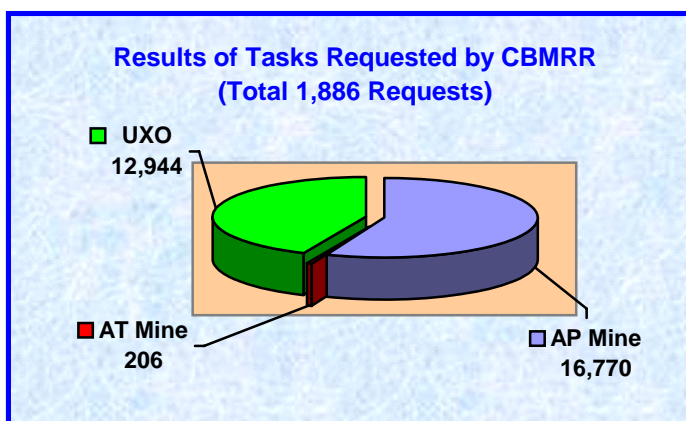
***To facilitate the access of mine/UXO affected communities to appropriate mine action activities, victim assistance and community development responses.***

**A. Link with mine action intervention services**

- In total, 1,886 requests of Mine & UXO action interventions were sent by CBMRR network to the mine action intervention teams. These requests led to the collection and destruction of 16,770 AP mines, 206 AT mines and 12,944 UXO. The requests for interventions were responded by small intervention teams such as MRE, EOD and CMC as well as conventional platoons, CBD platoons, MDD and brush cutters teams. Requests for interventions were also responded by Halo Trust (26

requests) and MAG (2 requests), which indicates a wide use of CBMRR's services and good coordination and cooperation on the ground between the CBMRR and different mine action operators.

- The responses to the above requests generated the following socio-economic outputs: safe land for 13 schools, 19 roads, 8 pagodas, 11 ponds, 6 access paths to water resources, 104 plots of land for resettlement and agriculture and 31 tasks for risk reduction.



### B. Link with victim assistance services

- The CBMRR staff assisted with the evacuation of 19 landmine and UXO victims in the districts and municipality of Malai, Svay Chek, Thmar Puok, O Chrove, Phnom Proeuk, Bavel, Salakrao and Pailin to the local hospitals, the Emergency Hospital in Battambang and hospitals in Thailand by Emergency, KAMA and CMAC.
- 147 existing and new amputees in CBMRR target areas in Battambang and Banteay Meanchey provinces were facilitated to receive and have their artificial limbs repaired at the ICRC.
- 29 old and new wheel chairs and 44 old and new crutches were provided and repaired by CRC, ICRC and FRA to the amputees in Phnom Malai, Svay Check, Thma Puok, O Chrove, Kamrieng, Phnom Preuk, Sampov Lune and Samlot districts.
- In addition, the CBMRR also assisted the local villagers to have access to and receive the following support and emergency relief:
  - 278 poorest/disabled families in O Ro-el, Phnom Koy, O Chheukram villages of Pailin and O Doemchek, Tatoak, Kampong Lpove villages of Samlot district, Battambang received emergency charity relief support from the CRC; this included 1,570 kgs of rice, 772 mosquito nets, 26 blankets, 261 scarves, 43 tarpaulins and 292 sarongs.
  - 60 pairs of clothes and 60 satchels were provided by CVD to poorest/disabled students in Phnom Koy village, Steung Kach commune, Khan Salakrao, Pailin.
  - CVD supported a voluntary teacher \$50 per year in order to teach 60 out-of-school children in Phnom Koy village, Khan Salakrao, Pailin.
  - 06 household kits were provided by CRC to 06 families victimized by fire in O Sampore-II village, Banteay Meanchey province.

### C. Link with community development services

- 08 primary schools in Veal Veng, Kamrieng, Rattanak Mondul, Bavel and Svay Chek Districts were built by HRDD, UNICEF, Peace Boat/JAPAN, LWF, WVC, ADB, Cell Agrith and Mekong.
- 61 portions of laterite roads, located in Malai, O Chrov, Kamrieng, Phnom Preuk and Sampovlune Districts, were repaired and constructed by SEILA, Village Association, WFP and ASK.
- 204 latrines were provided by LWS, Peace Boat and CRS for school students, poorest villagers and disabled families in Phnom Proek and Malai Districts.

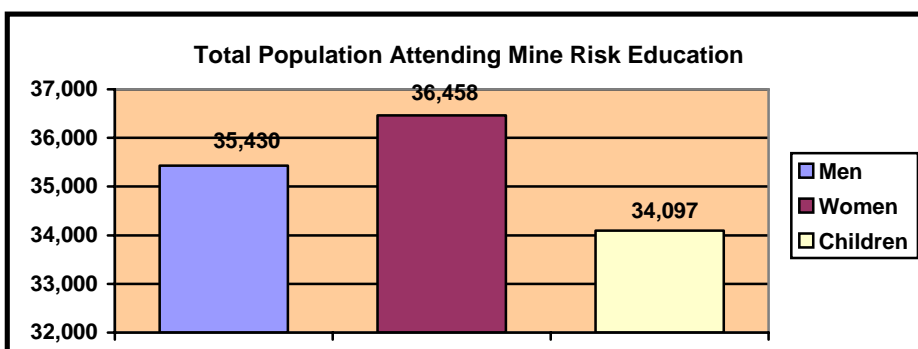
- 102 pump wells in Kamrieng, Rattanak Mondul, Kas Kralor, Sampovlune, Bavel, Svay Chek, Thma Puok, O Chrove, Malai and Phnom Kravanh Districts were provided by JMAS, Cherapheap Kampuchea, HI, WVC, EU, OEB, CMAC, DDSP, WFP, ADB, JSC and Samaritan's Purse.
- 02 health centers located in Malai and O Chrov Districts were built by SEILA program and CHO for public welfare and AIDS services.
- 541 water jars were provided by CARE for 541 poorest/disabled families in Thnal Kaeng, Krachab, Borhuy-Chheung, Suon Ampov-Keut villages, Pailin Municipality.
- 1,112 bottles of water were provided by CARE for 1003 poorest families in Boeng Prolit, Bar Taingsu, Thnal Kaeng, Krachab, Borhuy-Chheung, Suon Ampov-Keut villages, Pailin Municipality.
- 50 bags of fertilizers were donated by SEADO for 50 poorest and disabled families in Slakram village, Slakram commune, Svay Chek District of Banteay Meanchey Province.
- 4,842 kgs of rotation-crop (maize and soy bean) were provided by World Vision and ADMAC for 104 poorest/disabled families in O Andoung, O-Ro-el and Bos Saam villages, Khan Salakrao, Pailin Municipality.
- 01 water pump machine was provided by CRC to disabled family at O-Ro-el village, Sangkat Steung Katch, Khan Salakrao, Pailin.
- 01 water canal of 2,000 meters in length in Phnom Koy village, Khan Salakrao was built by local community, facilitated by CBMRR mine/UXO committee representatives.
- 67 cottages were built by SEADO, JSC, Samaritan's Purse for widows, disabled people and villagers whose houses were damaged by fire in Poipet Commune, O Chrove District of Banteay Meanchey Province.
- 08 ponds in Moung Russei, Rattanak Mondule, Phnom Kravanh and Malai Districts were dug and sponsored by Japanese NGO's, HI, and WVC.
- 20 pig banks were provided by Cell Agrith for 30 poorest/ disabled families in Phtas Rong Village, Phnom Kravanh District, Pursat Province.
- 28 cow banks were provided by Cell Agrith, SEADO, Trauma Care and ADA for 22 poorest/disabled families in Kamrieng, Svay Chek, Samlot and Phnom Kravanh Districts.
- 1,200 fingerlings were provided by DANIDA for 12 poorest/disabled families at Roveang and Ang krong Villages, Rokar Commune, Phnom Kravanh District, Pursat Province.
- 121 mosquito nets were distributed by RACHA for 121 families at Roveang Village, Samrong Commune, Phnom Kravanh District, Pursat.
- 270 family heads in Phnom Kravanh District of Pursat were trained in the techniques/skills in animal raising by Cell Agrith.
- 1,503 biological water filter containers were provided by CARE to 2,726 families in Krachab, Bor Taingsu, Borhuy-Chheung-Tboung, Srae Antak, Boeng Prolit, Koun Damrei, Thal Kaeng and O Andoung Villages of Khan Salakrao and Pailin, Pailin Municipality.
- 02 widow families in O-Ro-el Village were provided a micro-credit loan of \$175 per family by CRC to support their groceries.

### **Objective Three :**

***To maintain and improve the public information campaign to raise awareness among the mine/UXO affected communities.***

The CBMRR Mine/UXO Committee Representatives (volunteer networks) have an important role of making their community safer through providing the education on mine/UXO risks to the specific groups in their targeted locations. Throughout the year, they produced the following outputs:

Total villagers reached	105,985
Children	34,097
Men	35,430
Women	36,458
Total households visited	30,325



- In October, a new project concept called "UXO Risk Reduction through Scrap Metal Dealers, (URSMD)" was developed. It aims to strengthen the enforcement of the "Ban Landmines" and "Law on the Management of Weapons, Explosives and Ammunition" by providing mine/UXO awareness education to villagers through the scrap metal dealers as well as to obtain timely reports on UXO from the scrap metal dealers. That project will be piloted for six months (January to June 2007) by selecting 2 affected districts in Kandal province (Angsnuol district) and Kampong Speu province (Chbar Mon district).

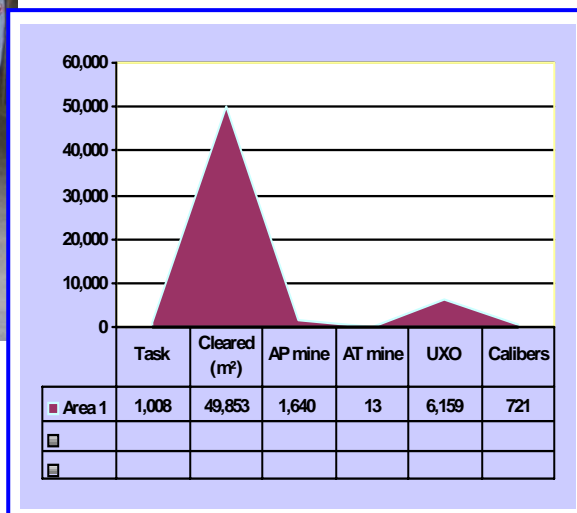
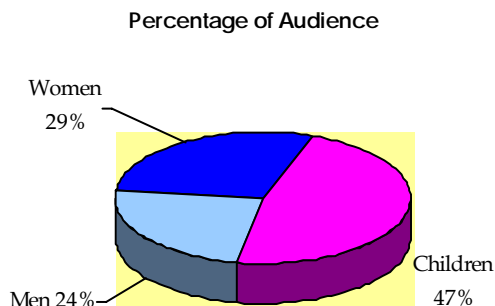


### 5.1.2 Mine Risk Education and Reduction Teams (MRE)

During the reporting period, CMAC deployed the following MRE teams:

Deployment	No. of Teams	Male	Female	Total	Province	Donors
MRE in DU#1	1	3	1	4	Banteay Meanchey	NPA
MRE in DU#2	1	3	1	4	Battambang	UNDP & UNICEF
MRE in DU#2	1	3	1	4	Pursat	UNDP & UNICEF
MRE in DU#3	1	3	1	4	Pailin	UNICEF & USA
MRE in ERO	1	3	1	4	Kampong Cham	UNDP & UNICEF
MRE in DU#6	1	3	1	4	Oddar Meanchey	UNDP & UNICEF
<b>Grand Total</b>	<b>6</b>	<b>18</b>	<b>6</b>	<b>24</b>	<b>6 Provinces</b>	

To respond to the community requirements for both mine/UXO risk education and risk reduction in their communities, CMAC deployed 6 mobile mine/UXO risk education and reduction teams (MRE) to provide mine and UXO risk education to villagers as well as



collect and destroy UXO as per request by the community they visited. Structurally, one MRE team consists of 4 persons, including 2 mine risk education experts and 2 EOD experts. One of their primary duties is to deliver mine risk education messages to people living in high risk areas and villages. The delivery of mine risk education messages is conducted through day and night presentations and household visits. During the reporting period, the MRE teams achieved 143.34% of the target villages and 144.44% of the target sessions for the period. Another primary duty is to collect and destroy UXO reported by the communities they visit. In addition, they also conduct limited clearance of mine/UXO suspected areas for risk reduction and to provide safe access to resources and facilities, such water sources, schools, pagodas, health centres, etc. The table and charts enclosed briefly illustrate the achievements made by MRE teams during the reporting period. It should be noted from the table below that within the reporting period, a significant number of mines and UXO were collected and destroyed, in addition to the tens of thousands of villagers who received mine/UXO risk education. With such important significance, the MRE teams have increasing role in the risk education.

• Village Reached	507	• Tasks Responded	1,008
• Session Reached	520	• Cleared (m <sup>2</sup> )	49,853
• Household Visited	13,398	• Found & Destroyed	
• Total Village Population	297,364	- AP mines	1,640
• Audience	66,640	- AT mines	13
- Men	16,010	- UXO	6,159
- Women	19,241	• Small Calibers (kgs)	721
- Children	31,389		

### 5.1.3 Community-Based UXO Risk Reduction (CBURR)

#### 5.1.3.1 Deployment

CMAC has a total of 16 CBURR District Focal Points located in high UXO casualty Districts in Kampong Speu, Kandal, Prey Veng and Svay Rieng. The identification of the districts where the CBURR DFP's operate is based on an assessment process mutually conducted by donors and CMAC and the deployment targets districts where the number of casualties is consistently high and where individual behaviors pose great concern and are prone to risks.



**Table:** Deployment of CBURR DFP's and Volunteer Networks

Provinces	Districts	DFP	Number of CBURR Volunteer Networks		
			Commune Level	Village Level	Total
Kampong Speu	Chbar Morn	1	3	22	25
	O Dung	1			
	Phnom Srouch	1			
	Samroang Tong	1			
Kandal	And Snoul	1	5	45	50
	Kandal Steung	1			
	Ksach Kandal	1			
	La Vea Em	1			
Prey Veng	Kampong Leav	1			
	Ba Phnom	1			
	Kampong Trabek	1			
	Preah Sdech	1			
Svay Rieng	Svay Chrum	1			
	Kampong Ro	1			
	Svay Teap	1			
	Romdoul	1			
<b>Total</b>	<b>16 Districts</b>	<b>16 DFP</b>	<b>8</b>	<b>67</b>	<b>75</b>

**Table:** Population in CBURR Target Areas

Provinces	Districts	Population in Target Areas			
		Commune	Village	Population	Households
Kampong Speu	Chbar Morn	5	56	43,313	8,051
	O Dung	15	251	117,396	20,568
	Phnom Srouch	12	126	90,392	15,886
	Samroang Tong	15	286	133,983	24,850
Kandal	AnG Snoul	16	307	110,158	19,089
	Kandal Steung	23	154	92,855	16,951
	Ksach Kandal	18	93	122,283	24,211
	La Vea Em	15	43	70,792	14,134

Prey Veng	Kampong Leav	8	44	58,804	12,284
	Ba Phnom	9	108	85,714	18,045
	Kampong Trabek	13	122	122,613	24,904
	Preah Sdech	11	145	121,190	23,888
Svay Rieng	Svay Chrum	17	168	150,282	29,206
	Kampong Ro	12	87	67,467	13,808
	Svay Teap	11	86	66,570	13,386
	Romdoul	10	78	53,138	11,040
<b>Total</b>	<b>16 Districts</b>	<b>210</b>	<b>2,154</b>	<b>1,506,950</b>	<b>290,289</b>

### 5.1.3.2 Achievements

CBURR District Focal Points (DFP) worked closely with the CBURR volunteer networks and the local authorities, where volunteer networks do not exist, in delivering UXO risk education to vulnerable groups and individual villagers by visiting households to assess their needs for UXO action, collect information about the risks and UXO contamination, and identify EOD tasks to be reported to the intervention teams for appropriate action to address the UXO threats in their communities. These CBURR DFP and volunteer networks



closely work with intervention teams such as EOD, MRE and CMC for quick response and interventions. During the reporting period, the CBURR made the following accomplishments:

• Number of visits to villages	3,141
• Sessions delivered	3,078
• Households visited	20,450
• Number of participants	102,493
- Men	33,135
- Women	29,394
- Children	39,964
• Total requests for interventions	2,340
- AP mines	942
- UXO	20,530

It should be positively noted that the casualty rates in the provinces of Svay Rieng, Kandal and Prey Veng, where 12 CBURR networks operate, dropped over 50% compared after the deployment of the CBURR in the high casualty districts. The reasons of the decrease in casualties can be roughly explained as follows:

- ⊙ Improving the status of socio-economic growth in the areas after UXO clearance that benefits the people in their farming business. Therefore, fewer people take risks to go into the scrap metal business.
- ⊙ Quick response to the UXO tasks requested by CBURR and the local authorities.
- ⊙ The CBURR expanded their UXO risk education activities to the UXO affected communities and directly delivered UXO risk education messages to the isolated areas.





- The local police, through training by CMAC and coordination with CBURR, are more involved in enforcing the laws on scrap metal business.

It should also be noted that starting from 2007 CMAC with support from UNICEF will launch a pilot project called "UXO Risk Reduction through Scrap Metal Dealers (URSMD)" which aims to educate the villagers and scrap metal dealers about the dangers of the metal they collect and how they can cooperate with CMAC or other operators and authorities to avoid fatal accidents caused by this business.

### 5.1.4 Mass Media Campaign

During the reporting period, the Mass Media Campaign played an important role within the public advertising and the media broadcasting systems to help reach the people in areas where CMAC's mobile teams are not available to deliver mine/UXO risk education directly. Educational TV spots are especially attractive to all-aged population as they involve popular actors, portray real daily life of the people, and educate people in a very simple but eye-catching way. For the education story, men and children are usually targeted as they are the most vulnerable people in the communities.

#### 5.1.4.1 Television and Radio Spot Production

- A new TV spot and a new radio spot, titled "*Children, Mine/UXO risk Activity and Consequences*" was produced, targeting children and a variety of activities which expose them to risks and accidents. Real children-amputees, who are currently under the care of OEB (Opérations Enfants de Battambang) based in Battambang, were selected to act in the spot, telling their true stories leading to the accidents and the consequences facing their post-accident lives.



- In addition, a TV spot and a radio spot were updated to incorporate new messages to make the spots more adaptive and appropriate in the current environment.

#### 5.1.4.2 TV Broadcasts (number of broadcasts)

TVK	TV Bayon	TVK Battambang	TVK Pursat	TOTAL
200	200	200	200	<b>800</b>

**5.1.4.3 Radio Broadcasts (number of air times)**

National Radio	Battambang	Pursat	Pailin	Phreah Vihear	Banteay Meanchey	TOTAL
300	300	300	300	300	300	<b>1,800</b>

**5.1.4.4 Billboard Production and Campaign**

- 5 new billboards were produced and erected in Preah Vihear and Oddar Meanchey Provinces. They contain education messages such as: "Ban landmines", "Consequences caused by improvised metal detectors", "Do not collect mines/UXO for selling", "Do not damage mine warning signs", and "Do not collect woods in mined areas", etc. In addition, 10 old billboards, with similar contents, were repaired.



**5.1.4.5 Re-Production and Compilation**

- 390 VCD, 30 video tapes and 90 audio tapes were re-copied
- 06 types of printed risk education materials such as poster, leaflet, notebook, t-shirts, and plastic bag were designed and developed for production. This was financially supported by UNICEF.

**5.1.5 NGO Campaign**

During the reporting period, a total of 51 staff (47 males 04 females) from CARE, CMVIS, OEB and Austcare received mine/UXO risk education. The NGO campaign aims to provide mine/UXO risk education to the local and expatriate staff who work in development NGO's, which are usually involved working in mine/UXO risk areas, so that they are aware of the mine/UXO problems, know how to avoid risks and dangers, have the confidence in approaching a mine/UXO affected community, and can disseminate the risk education messages to other who are



exposed to similar risks. New staff of these NGO's are usually briefed by CMAC's MRE Office before they are dispatched to the risk areas.

### 5.1.6 Field Monitoring

- In June, CMAA commissioned a field monitoring team consisting of officers and experts from CMAA, UNICEF, MoEYS, CMVIS and HI-Belgium team to conduct a monitoring and evaluation of the MRE team in Banteay Meanchey. The visit was focused on the new strategy of a more multi-skilled functioning in both provision of mine/UXO risk education and carrying out EOD, and limited clearance tasks so that to measure and evaluate this new strategy developed and innovated in January 2006.



### 5.1.7 Other Activities

- On 24 February 2006, all CBMRR staff and mine/UXO Committee Representatives were invited to celebrate the National Mine Awareness Day, which was organized by CMAA in Pailin Municipality. Similarly, MRE staff in Banteay Meanchey also attended the National Mine Awareness Day organized by JSC in Banteay Meanrith Village, Kork Romiet Commune, Thmar Puok District, Banteay Meanchey Province. Cambodia celebrates the National Mine Awareness Day every year on 24 February to bring up the level of awareness of the mine and UXO problem and also to discuss strategies to reduce and eliminate casualties caused by mines and UXO.
- In June, CMAC was invited to join in the field monitoring and evaluation of school Mine/UXO risk education activities "Student Centre" under a program run by the Ministry of Education, Youth and Sports at Thma Puok District, Banteay Meanchey Province.
- In November, 434 bicycles donated by NPA were distributed to all CBMRR mine/UXO Committee Representatives (Voluntary Networks) working in Banteay Menachey, Battambang, Pailin, Pursat and Oddar Meanchey Provinces. It was part of incentives and motivation for those volunteer networks and these bicycles also provide a means of transport for the volunteer networks to deliver their services to the communities.





### 5.2 SURVEY, MARKING AND AREA REDUCTION

Over the past 14 years, approaches to mine action have evolved and changed. In the early phases of mine action, focus was placed on clearing large scale of area for emergency and risk reduction purposes. As mine action methodology and technology improve, resources become scarce, and priorities change, mine action today is conducted in a slightly different way from the first day of demining operations. Today, information, obtained through (technical) survey, plays a crucial role in determining where to clear, how to clear and when to clear. This is particularly essential in the Cambodian context where abundant landmines were laid by all warring parties and factions (no records or reports) and availability of resources to clear these landmines remains a persistent and critical challenge.



Since there are no records of where the mines were laid, information on their locations has to be gathered by interviewing villagers and former soldiers and by gathering data on casualties. Very often it is more appropriate to conduct a technical survey when there is no immediate need to clear all the land. The objective in such circumstance



is to accurately identify, record, mark and fence the outer edge of the hazardous area, and by doing so release some land for productive use. The process through which the initial area indicated as

contaminated (during the general mine action assessment) is reduced to a smaller area is known as area reduction.

CMAC alike has developed an effective technical survey capacity and has been implementing it since 2002. The primary aim of CMAC's technical survey is to collect and verify landmine and UXO contamination information to quickly and reliably identify and classify the contaminated areas, level of risks and to enable the clearance requirements to be more clearly defined. In order to speed up technical survey information collection, CMAC redefined its technical survey concept and process in late 2006. In this new concept, technical survey utilizes the community-based mine risk reduction network members as the moderator of information by using all existing sources of information within their community and by coordinating with key informants as well as the local authorities to ensure that the obtained information is verifiable and reliable. While the new concept of technical survey involves a lot of inputs from the local authorities and the CBMRR, its outputs (mine/UXO contamination maps) are distributed more widely to the village authorities, PMAC/MAPU and CMAA for planning and prioritization purposes. Land released through this process can also be removed from the contamination map in the national database.



CMAC technical survey is designed to produce three main outputs. Firstly, it aims to provide a sustainable mine action information tool at the community level by providing appropriate training to the Community-Based Mine Risk Reduction (CBMRR) members and their volunteers on how to regularly and systematically update the landmine and UXO problem within their community on a provided map. A similar training is also provided to the Provincial Mine Action Committee (PMAC) members for the same purpose - updating and using the map for the planning and prioritization purpose. This effort can naturally strengthen the communication and cooperation between the affected community (CBMRR) and local authority (PMAC) for both prioritization and planning processes. Secondly, the technical survey defines a new road map for the affected community by identifying the real threat of landmines and UXO and classifying the level of threats and technical requirements for subsequent clearance operations. Thirdly, this effort frequently reduces a significant size of suspected landmine and UXO areas previously identified by the Impact Survey. The released areas, through the process called area reduction, can be recorded and mapped



in a systematic and professional manner. In response to the Royal Government's policy of accelerated area reduction, technical survey plays even a more crucial role in determining which area can be released to productive use based on a systematic and professional technical assessment. In addition, through the technical survey process, minefields or contaminated areas not previously recorded in the Impact Survey (Level One Survey) are also identified. This indicates the level of accuracy and depth of the technical survey, which fully and systematically collects, records and analyzes mine contamination problem in a given village.

### 5.2.1 Deployment

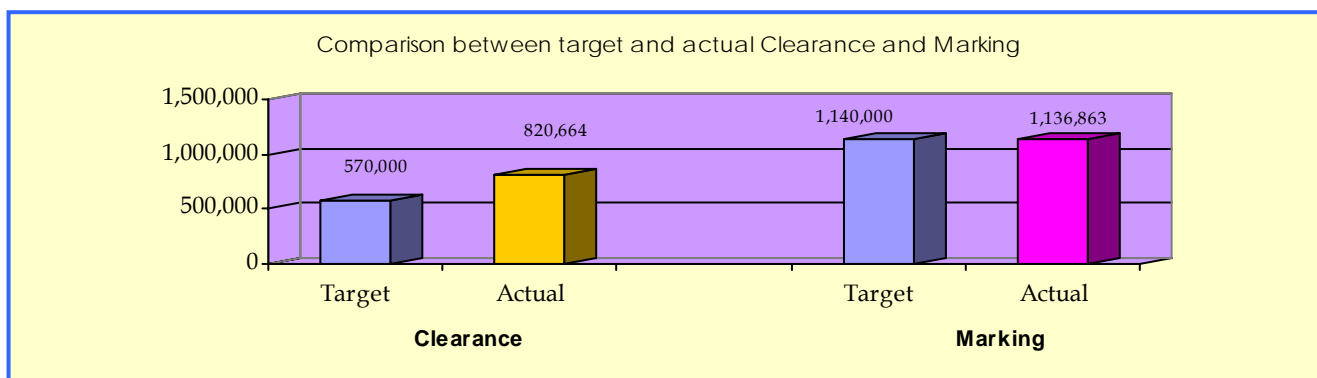
During the reporting period, CMAC deployed a total of 23 technical survey teams - 19 small teams of 5 members each and 4 large teams of 10 members each. The deployment of the small TS teams is spread out in all demining units to map and conduct minefield pre-clearance survey, marking and limited clearance for risk reduction. The deployment of the four large technical survey teams was concentrated on high casualty provinces such as Banteay Meanchey, Battambang and Pailin. Battambang and Pailin has been known to have the highest casualty rates of all provinces in Cambodia, therefore the technical survey strength has been particularly focused on these two areas.

### 5.2.2 Achievements

#### 5.2.2.1 Small Technical Survey Teams

During the reporting period, CMAC deployed 19 small TST teams throughout the 5 demining units. The major tasks of these teams are to map, survey, and mark minefields in preparation for clearance by other toolboxes. In addition, they also conduct limited clearance for risk reduction or other specific purposes.

⊙ Area cleared (m <sup>2</sup> )	<b>820,664</b>
⊙ AP mines found & destroyed	<b>166</b>
⊙ AT mines found & destroyed	<b>3</b>
⊙ UXO found & destroyed	<b>167</b>
⊙ Linear meter marked (m)	<b>1,136,863</b>
⊙ Number of minefields surveyed and marked	<b>203</b>
⊙ Fragments unearthed	<b>277,263</b>

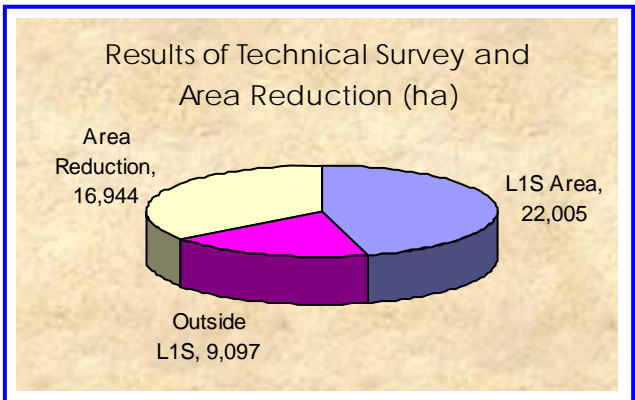
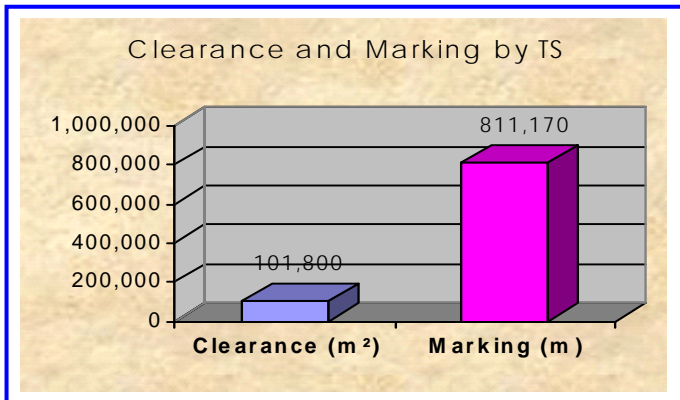
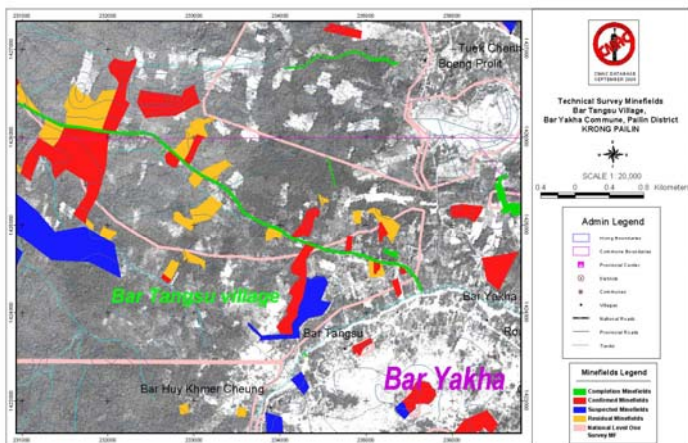


### 5.2.2.2 Large Technical Survey Teams

During this reporting period, 2 teams were deployed in DU2 Battambang and the other 2 in DU3 Pailin. One team was initially deployed in Banteay Meanchey, but due to the requirement to complete technical survey in Pailin, it was moved there. According to CMAC's new concept of technical survey, it is targeted that technical survey will be thoroughly and fully conducted in each province (starting from most heavily contaminated and highest casualty provinces such as Pailin, Battambang and Banteay Meanchey) to map out the total mine and UXO problem in the those provinces for area reduction and subsequent planning and prioritization.



The major tasks of the large technical survey teams include collection, verification and analysis of information obtained from the key informants as well as from the local authorities, communities and CMAC's CBMRR where they exist in the survey villages to identify contaminated areas from non-threat areas. The outputs of the technical survey will be mapped under the categories of confirmed minefields, residual minefields and suspected minefields. Non-threat areas initially identified as contaminated or suspected areas in the Impact Survey (Level One Survey) will be reduced from the contamination map and this is referred to as area reduction. Results of the technical survey are distributed to the village, CMAC's demining unit, PMAC/MAPU and CMAA for subsequent applications (planning and prioritization) and follow-up. Minefields identified through the technical survey process are also marked with permanent marking as information to the villagers and for subsequent identification and action.



One very important note about the technical survey activities in 2006 is the significant area reduction they achieved through the technical survey process in Pailin and Battambang. In total they surveyed 22,005.44 ha of area reported as contaminated in the Impact Survey (Level One Survey). Of this, they reduced a total area of 16,944.85 ha from the Level One Survey (area reduction), which means that this 16,944.85 ha is free from or of very low threat and can be returned to productive use. Without this technical process, this 16,944.85 ha would be otherwise fully cleared, squeezing on the already- scarce resources. This is indeed in line with the Royal Government's strategy of area reduction to return land to normal use. In addition, through the technical survey process, 9,097.11 ha of contaminated area was identified outside the Level One Survey records. This emphasizes the level of accuracy and depth of technical survey as well as its importance and applications in mine action. It also highlights the important characteristics and practicality of CMAC's technical survey as a key tool contributing to mine action.

Number of villages surveyed	<b>59</b>
Area in Level One Survey (before TS) - ha	<b>22,005.44</b>
Area reduction from L1S (after TS) - ha	<b>16,944.85</b>
Total contaminated area found outside L1S (after TS) - ha	<b>9,097.11</b>
Total contaminated area after TS (in L1S & outside L1S) - ha	<b>14,157.70</b>
Confirmed minefields – ha	<b>10,740.70</b>
Residual minefields – ha	<b>2,048.50</b>
Suspected minefields – ha	<b>1,368.60</b>
Area cleared by TS - m <sup>2</sup> (excluding admin area, etc)	<b>101,800</b>
AP mines found & destroyed	<b>335</b>
AT mines found & destroyed	<b>26</b>
UXO found & destroyed	<b>146</b>
Linear meters marked – m	<b>811,170</b>
Fragments unearthed	<b>66,359</b>

### 5.3 LANDMINE AND UXO CLEARANCE

#### 5.3.1 The Demining Platoon (Normal and Mobile)

The primary task of the demining platoons is to conduct full and large scale clearance of mine/UXO areas, both low-density and high density contamination minefields, to provide risk reduction and support resettlement, agriculture, community livelihood and development activities. The minefields cleared by the platoons are selected annually through the MAPU process, approved by the PMAC and integrated in CMAC's Annual Work Plan. Minefields



selected through this process are classified under two categories to meet the climate conditions of Cambodia: wet season minefields and dry season minefields. Spare minefields are also selected through this process to ensure smooth demining operations throughout the year.





See note below

From January to August of the reporting period, CMAC deployed 41 demining platoons; 03 normal platoons and 39 mobile, and from September to December, CMAC had only 39 demining platoons deployed as 4 platoons were demobilized due to internal reform and to meet funding situation. These platoons were deployed in all Demining Units, with 69% of the platoons deployed in 4 provinces of Battambang, Pursat, Pailin and Banteay Meanchey (western part of Cambodia along the Thai-Cambodia Border). The remaining resources were deployed in the provinces of Kompong Thom, Preah Vihear, Siem Reap and Oddor Meanchey.

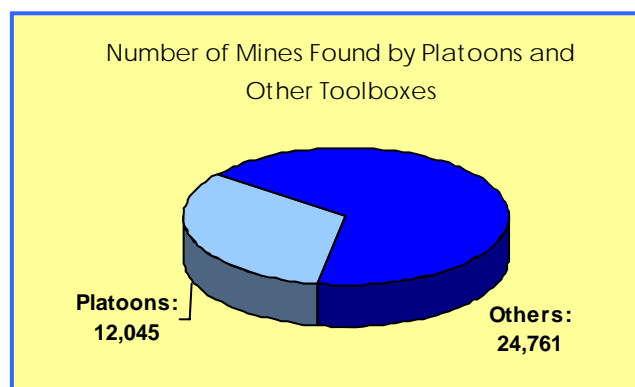
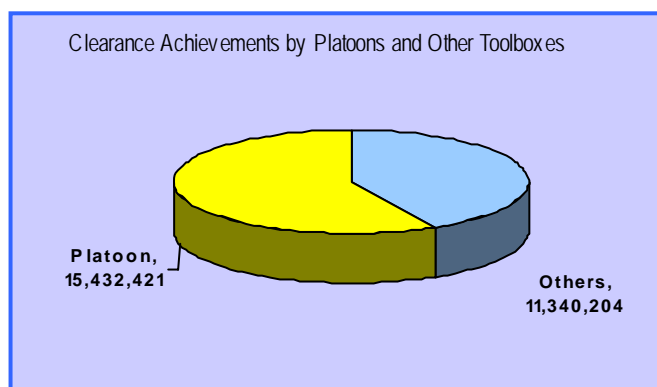
The demining platoons remain the workhorse of CMAC and produce the largest portion of clearance compared to other toolboxes. In 2006, the platoons alone cleared a total of 15,432,421 m<sup>2</sup> of area, which is about 57% of CMAC's total productivity of the year.

Demining platoons are either deployed alone or integrated with other toolboxes such as Brush Cutter teams and Mine Detection Dog teams in order to speed up clearance activities. The integration of toolboxes aims to make mine clearance more effective and efficient, as different minefield terrains are suitable for different toolboxes. For instance, if a minefield is covered with heavy vegetation, a brush cutter is needed to assist the platoon to remove the vegetation. A brush cutter is also needed in a complicated minefield contaminated with sensitive AP mines, especially Type 72. If, for instance, part of a minefield is contaminated heavily with fragments, an MDD team is useful. The integration helps CMAC select the right task for the right tool. It is also very important to manage the integration properly to avoid overlapping roles or downtime due to poor field management.

In addition, the demining platoons are also assisted by hand-held grass cutting machines, which play a very important role to remove light to medium vegetation in the minefields. These grass cutting machines are light and flexible, and they are suitable for most minefields. These hand-held grass cutting machines are also used with other teams such as MDD, CMC, etc.

**Note on the photos above:** 12 anti-tank mines were found near a villager's house in O Khmum Village, Sdao Commune, Ratanak Mondul District of Battambang Province. Six stacks of 2 TM-46 anti-tank mines each were found in 6 separate spots approximately 2 to 7 metres apart about 5 metres from the villager's house. The mines were initially discovered by the villager in two spots as he was clearing the land for cultivation, and the remaining were detected by CMAC. All mines were retrieved safely.

• Area cleared (m <sup>2</sup> )	<b>15,432,421</b>
• Total target for 2006 (m <sup>2</sup> )	<b>8,610,000</b>
• Number of minefields cleared	<b>330</b>
• AP mines found & destroyed	<b>11,747</b>
• AT mines found & destroyed	<b>298</b>
• UXO found & destroyed	<b>6,392</b>
• Fragments unearthed	<b>21,639,217</b>
• Small calibers (kgs)	<b>2</b>



### 5.3.2 The Community Mine Clearance Teams (CMC)

In an effort to increase the efficiency and effectiveness to provide quick response to the requests for risk reduction and small scale development by the affected communities, in 2005 CMAC took a bold initiative to reform its operational teams by conducting trial of a new team structure called Community Mine Clearance (CMC) Team. The purpose was to design an appropriate and reasonable team structure to replace the Community Mine Marking Teams (CMT) and Mine Risk Reduction Teams (MRT), taking into account past experience, nature of problems and tasks, mobility, appropriateness of team structure, and other factors. The trial proved that the new concept was appropriate, more efficient and more responsive, and therefore recommended the establishment of the CMC teams to replace the CMT and MRT teams.





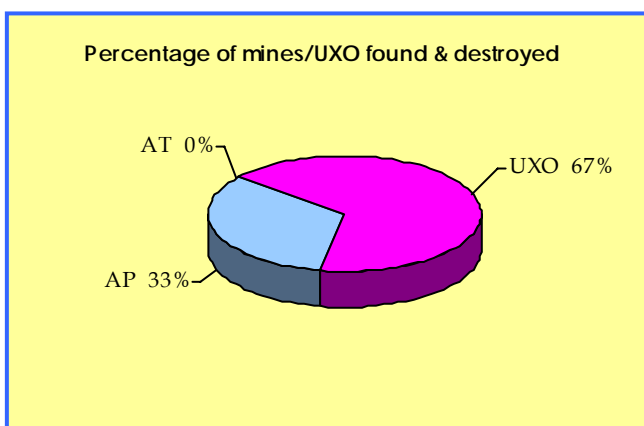
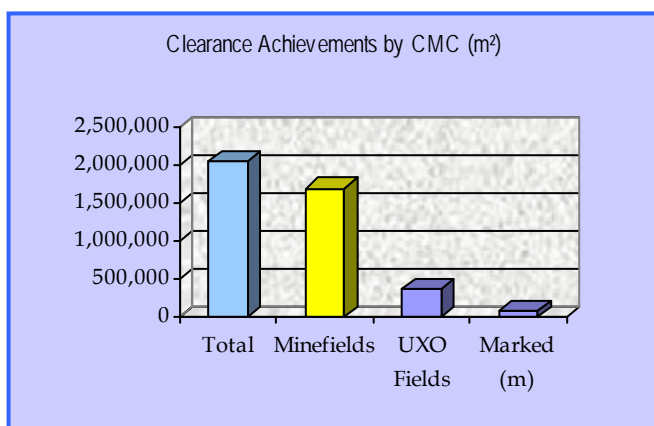
A CMC Team consists of 9 people: 1 Team Leader, 1 Senior Member and 7 Members. The task of the CMC team is to conduct small scale clearance of land up to one hectare (10,000 m<sup>2</sup>) to provide risk reduction and support development. These Teams clear minefields identified, prioritized and selected by PMAC/MAPU, put up long term marking, as well as respond to the risk reduction tasks requested by the communities on an emergency basis.

Through one year of operations on the ground, CMAC realizes that the CMC concept is very effective and efficient in terms of deployment, flexibility, and response to tasks. The CMC teams are also trained in UXO search and demolition and are equipped with UXO detectors. So, in addition to clearing minefields, these teams are also capable of cleaning UXO fields. In addition to the multi-skills, the CMC team structure allows great flexibility and efficiency in small scale and rapid deployment; therefore they are very much appreciated by donors and partners for their quick response and are in high demand for their deployment. The CMC teams operate with the following objectives:

- ◉ To provide the target communities with safe access to resources to facilitate their socio-economic development. In this context, the local communities will set the priorities in line with their local development requirements.
- ◉ To support NGOs' efforts to carry out development activities in the target areas.

In 2006, CMAC deployed 13 CMC teams in all demining units, with the following achievements:

• Total area cleared (m <sup>2</sup> )	2,053,456
• Area of minefields (m <sup>2</sup> )	1,697,470
• Area of UXO fields (m <sup>2</sup> )	355,986
• Total target for 2006 (m <sup>2</sup> )	1,248,000
• AP mines found & destroyed	1,012
• AT mines found & destroyed	5
• UXO found & destroyed	2,048
• Linear meter marked (m)	84,950
• Fragments unearthed	1,387,261
• Small Calibers (kgs)	290



### 5.3.3 Mechanical Brush Cutters

Brush cutters were originally designed to cut and remove vegetation (non-ground engaging) in the mine fields to support other demining components such as manual demining teams, platoons, and MDD teams. Since introduction into operations the brush cutters have enormously helped speed up the demining process and have changed the way demining is conducted in Cambodia. With the use

of these machines, coupled with better field management and training, CMAC was able to double its productivity in 2005 and continues to deliver very high productivity in 2006.



In 2005, CMAC took an initiative to trial this system to function as a stand-alone landmine clearance (ground engaging) system in addition to the sole vegetation clearing function. The trial was successful and the system proves a very effective and useful landmine clearance system. As a result of the trial, CMAC reviewed the SOP



and started to use the brush cutters for both vegetation cutting and ground engaging activities. To make them even more effective and efficient, 4 deminers are attached to each brush cutter.

With the added function and structure, the brush cutters have become a very important and effective toolbox. They are useful in several ways. First, they assist with vegetation removal, which significantly speeds up demining activities. Some minefields in Cambodia are twenty to thirty years old, so they are heavily covered by vegetation. Without the brush cutters, it is simply disastrous for the deminers to work manually. Second, in addition to the cutting attachment, the brush cutters are also attached with grapple hands, which enable uprooting and lifting heavy objects from the minefields. Third, they actually clear minefields through the ground penetration function. This assists deminers significantly in complicated minefields such as those contaminated with sensitive AP mines Type 72. Fourth, they can also assist development activities such as digging water canals and ponds and paving roads, etc, to help the communities. Fifth, brush cutters can be used to excavate soil mounds in suspected minefields and hard-soil minefield. The Hitachi brush cutters can also be attached with the multi-tool sifters from US Night Vision to sift soil and clear AP mines in certain minefield conditions. And last, but not least, their self-recovery capability is incredible. The brush cutters, considering their weight, are designed to work all year round. When stuck, they use their long arm to help recover themselves. In summary, the brush cutters are every effective machines. They are used both as a stand-alone tool or integrated with other toolboxes, such as manual platoons, MDD, etc. It should be highlighted that since the introduction of the brush cutters, together with improvements of SOP's and field management, CMAC has been able to double its annual productivity from around 10 to 12 km<sup>2</sup> until 2004 to 22 km<sup>2</sup> in 2005 and 26 km<sup>2</sup> in 2006.

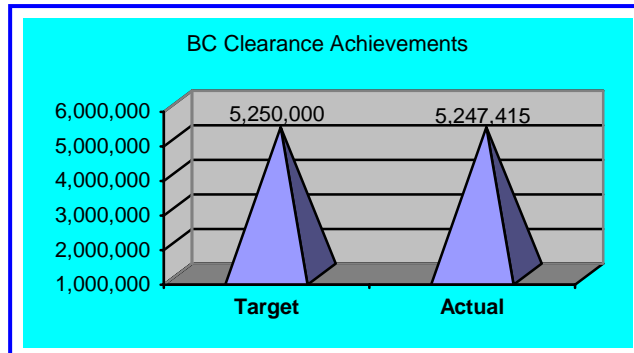
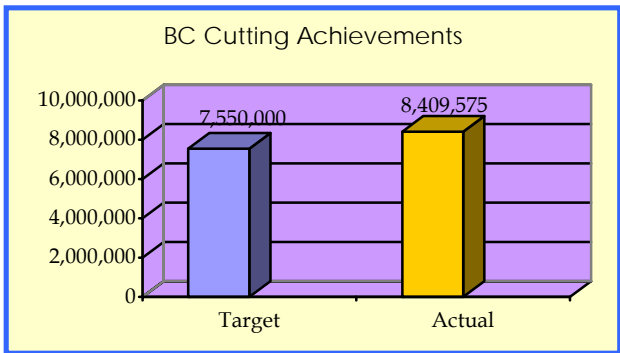


In 2006, a brush cutter detonated an anti-tank mine in Samlot area during operations. The accident caused only minor damages to the attachment and the machine was back to operations only after a few hours of repair. The operator in the cabin was completely safe, physically and mentally.

In 2006, CMAC deployed 26 brush cutters in the first 2 months. One Komatsu was removed from demining operations, sent to assist the Explosive Harvesting Program (EHP) in CMAC Training Center Kampong Chhnang, and then brought to CMAC's Central Workshop in Battambang in reserve for development activities. Another Komatsu was also removed from demining operations and sent to assist the Research and Development Project in Siem Reap province from the end of February to November 2006. It is now kept there ready to assist development work. This means in total CMAC deployed only 25 Hitachi brush cutters from February 2006 in field demining operations.

• Vegetation cutting (m <sup>2</sup> )	<b>8,409,575</b>
• Area cleared (m <sup>2</sup> )	<b>5,247,415</b>
• Cleared soil mounds in minefields (m <sup>2</sup> )	<b>119,563</b>

• AP mines found & destroyed	<b>7,187</b>
• AT mines found & destroyed	<b>53</b>
• UXO found & destroyed	<b>1,761</b>
• Fragments unearthed	<b>1,432,619</b>



**Brush Cutters Supporting Development:**

Besides operations in the minefields, the BC teams also carried out community development tasks to assist the communities living the mine affected areas. In 2006, the brush cutters assisted Peace Boat to dig 2 large water ponds in O sampor village, Malai district, Banteay Meanchey province to provide water sources for the communities in living in this area. Besides, the brush cutters also helped pave access roads to enable transportation and communities within their working areas.



**5.3.4 Mine/Explosive Detection Dog Teams (MDD/EDD)**

The Mine Detection Dog (MDD) program was introduced into CMAC in late 1996, with the aim to use mine dogs to fill CMAC's technical gaps in order to accelerate mine clearance progress. The initial application of MDD was to in survey activities to locate the actual start line of minefield boundary. However, the MDD's have eventually become a very important clearance tool and the MDD teams are now integrated with other demining toolboxes as such manual platoons and the brush cutters to assist manual demining in minefields contaminated with fragments, laterite soil and metal or hard grounds.



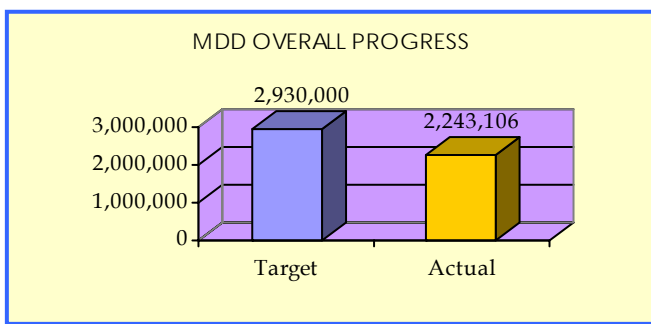
The Mine Detection Dog has become one of the most important and effective demining tools in the recent years, and many demining organizations are becoming more and more confident in utilizing dogs to support demining activities. CMAC has established and sustained an effective operational



MDD program, and has extended this service to MAG to support MAG’s demining operations in Cambodia. In 2005, CMAC established the long-leash dogs in addition to the existing short leash dogs in order to diversify the search patterns to respond to different types of terrain and minefield conditions. In 2006, CMAC trained 4 explosive detection dogs for UXO clearance to even further speed up the UXO clearance operations. CMAC will put these EDD dogs into operations in 2007 in the UXO fields.

In year 2006, CMAC deployed 14 MDD teams: 10 short leash teams with 4 dogs per team and 4 long leash teams with 2 dogs per team. Out of these teams CMAC seconded 3 long leash teams to support MAG's demining operations in Battambang and Preah Vihear. In the reporting period, the overall achievement of the MDD teams fell around 20% below the target. This underperformance was due to the fact that many training courses were conducted during the period in order to improve the MDD skills, field management and training. Even though the clearance achievement is a bit lower than expected, it is reasonably acceptable considering the capacity building trade-off.

• Area cleared (m <sup>2</sup> )	<b>2,243,106</b>
• AP mines found & destroyed	<b>373</b>
• AT mines found & destroyed	<b>11</b>
• UXO found & destroyed	<b>471</b>
• Small caliber	<b>1kg</b>
• Fragment unearthed	<b>57,540</b>



## MDD/EDD Training

The training of dogs and MDD personnel are conducted at CMAC's Training Center in Kampong Chhnang, with the aim to sustain MDD operations through a quality and sustainable training program. Currently, CMAC annually receives more than 10 semi-trained dogs from the GTC (NPA's Global Training Centre in Bosnia) under a financial support scheme from the Government of Netherlands. These semi-trained dogs are then trained at CMAC's Training Centre for a further 4 to 6 months before they are fully trained and ready for field operations. To maintain and control the MDD quality and fitness, all field operational MDD's are sent from the Demining Units to the Training Centre every six months for refresher training, test and licensing. At this period, the MDD's must pass the test to be licensed to continue working in the field. It is therefore also the responsibility of the Training Centre to conduct the test and licensing of dogs, field monitoring, procedures (SOP) development and trial evaluation.

As already mentioned earlier, 4 explosive detection dogs (EDD) are being trained and trialed at the Training Centre, and the trial has shown promising results in terms of potential deployment of the EDD in the real UXO fields. CMAC will thoroughly continue to evaluate the performance of the EDD's in 2007, design appropriate SOP's, assess potential areas for deployment, and will eventually deploy the EDD's in the real UXO field operations. The success of deploying these EDD's in the fields will mark another milestone in CMAC in terms of ERW detection and removal, as these continue to pose severe threats, kill and injure many civilians.

S.N	Course Title	Trainees from	Number of Trainees	Duration	Start Date	Remark
<b>Quarter 1 (Jan/Feb/Mar-2006)</b>						
1	UXO dog Training and Trial	TC	4	1 year	Jan-06	Ongoing
2	Basic Dog Handler Course	External recruits	16	12 weeks	21-Nov-05	Completed
3	SLD team refresher course	Team 10, 11	18	2 weeks	16-Jan-06	Completed
4	SLD team refresher course	Team 01	9	2 weeks	06-Feb-06	Completed
5	DU Ops - MDD Integration	Demining Units	7	5 days	20-Feb-06	Completed
6	SLD team refresher course	Team 3, 4	18	2 weeks	27-Feb-06	Completed
<b>Quarter 2 (April/Mar/June-2006)</b>						
7	SLD team refresher course	Team 6, 7	18	2 weeks	18-Apr-06	Completed
8	SLD team refresher course	Team 02	9	2 weeks	24-Apr-06	Completed
9	SLD team refresher course	Team 5, 8	18	2Weeks	17-May-06	Completed
10	LLD team refresher course	Team 01, 02	6	2 weeks	29-May-06	Completed
11	SLD Operational Course	External recruits	14	3 months	15-Mar-06	Completed
<b>Quarter 03 (July/Aug/Sept-2006)</b>						
12	LLD Operational Course	Ex-SLDH	7	10Weeks	22-May-06	Completed
13	Basic Dog Handler Course	CM/CBD	17	3Monts	22-May-06	Completed
14	SLD team refresher course	Team 10	9	2 weeks	14-Aug-06	Completed
15	SLD Operational Course	Internal	2	2 months	11-Sep-06	Completed
<b>Quarter 04 (Oct/Nov/Dec-2006)</b>						
16	SLD team refresher course	Team 11, 02	18	2 weeks	26-Sep-06	Completed
17	SLD team refresher course	Team 03, 04	18	2 weeks	09-Oct-06	Completed





18	SLD team refresher course	Team 06, 07	18	2 weeks	13-Nov-06	Completed
19	SLD team refresher course	Team 05	9	2 weeks	12-Dec-06	Completed



**Veterinary Support**

The veterinary support plays an important role in the MDD program to make sure that the MDD's are always fit for training and field operations. Its role is to provide both medical and health care support for all mine detection dogs, and CMAC has a residual capacity to provide the following veterinary services:

- ⊙ Daily health control
- ⊙ Weekly inspection
- ⊙ Monthly anti-parasite program
- ⊙ Annual vaccination.
- ⊙ Minor surgery
- ⊙ Preventive measures and,



However, veterinary services which require high-tech facilities such as lab and diagnosis, severe surgery, autopsy, echography and X-ray and pharmacology are contracted to the French Agrovet Animal Hospital in Phnom Penh.

### 5.3.5 Explosive Ordnance Disposal Teams (EOD)

The explosives remnants of wars scattered virtually everywhere in the country after the three-decade long conflicts and heavy US bombing continue to pose fatal threats to millions of civilian population. The evidence of the magnitude of the ERW problem lies with the high casualty rate that Cambodia suffers from. The attractive shape and scrap metal trade for scarce cash makes these ERW one of the most dangerous killers in post-war Cambodia. Furthermore, with the expanding economic and commercial activities as a result of road links and mining contracts in the eastern provinces, it is required that the response to the ERW problem needs to be increased.



Similarly, the recent ERW Study conducted by CMAA and NPA with the financial support by the US State Department stresses the importance of the increased EOD response and the important role of CMAC in the long term EOD operations, in conjunction with other key players such as the National Police and the Armed Forces. This study has become the basis for the National EOD Strategic Plan, which recognizes CMAC as a long term key player in EOD operations. The Plan also calls for the establishment of the Centre of Excellence for EOD, and the existing CMAC's Training Centre is expected to be utilized for this purpose.

With the continued demand for increased EOD capacity, the established EOD Response framework within the National EOD Strategic Plan and the Royal Government's commitment to combat the UXO problem, CMAC is required to continue to make significant contributions as a key player in the short, medium and long term to the national EOD response capacity. In this respect, CMAC needs to increase EOD capacity as well as skills to meet the expectations from different players. In 2006, CMAC deployed a total of 21 EOD teams. These teams were deployed in both eastern and western provinces to respond to the EOD needs. The increased requirement for EOD presence in the eastern provinces was highlighted in the establishment of the EOD Eastern Regional Office (ERO) in early 2006 in Kampong Cham to manage and monitor EOD activities in the eastern part of the country. It started with 2 EOD teams supported by UNDP's "Clearing for Results" Project, and expanded to cover 5 teams, supported by JMAS.

As part of the EOD response, the CBURR service is also critical is a key contributing factor in UXO risk reduction. Thanks to the deployment of CBURR in the four provinces, the number of UXO incidents in the target districts remarkably decreased. However, it should be noted that the overall UXO accidents remain on the increasing line and the number of accidents remains higher than that caused by

landmines due to poverty, individual behaviors and attractive price of scrap metal. In response to this phenomenon, CMAC maintains the presence of its EOD teams in the highest UXO casualty rate and CBURR-target communities to timely respond to EOD requests in order to reduce the number of UXO accidents and provide a safe living and livelihood environment for the community. In summary terms, EOD teams and CBURR are closely interlinked and complement each other in the effort to minimize the accidents caused by UXO.

• Number of tasks responded	8,370
• Area cleared as spot checks (m <sup>2</sup> )	193,463
• Items destroyed by EOD (including 126 bombs)	108,336
• Small calibers (kgs)	4,182

In 2006, all the EOD teams responded to 8,370 tasks, with a total output of 108,336 items collected and destroyed, which is slightly lower than expected. However, this is already a significant number of items collected and destroyed. In addition, the EOD teams also conducted spot clearance around the locations where they collected UXO to make sure that no other ERW's were left behind in those locations which would pose future risks and require repeated action. Another point to note is that even after over 10 years of operations, CMAC still finds new types of UXO from time to time, some dating back to the World War II.



### 5.3.6 Community-Based Demining Platoons (CBD)

To respond to the magnitude of the mine/UXO problem in some high casualty and highly contaminated communities, where the young people lack the means to generate income and are prone to risk from their livelihoods, where the landmine/UXO threat is constant and long term, and where economy and resettlement are severely impeded by the presence of vast minefields surrounding the communities, CMAC continues to involve the affected communities to conduct landmine/UXO clearance in their own communities for the purpose of their community rehabilitation

and development. In this respect, the Community-Based Demining (CBD) has been established at the commune level with community deminers recruited and trained from the affected villages within the communes. The principle aim of the community-based demining is to reduce the risks to communities and provide safe land for the community rehabilitation and development.

All members of the CBD platoons are recruited from the community based on the following criteria:

- Priority 1: Mine victims from poor families.
- Priority 2: Widows or widowers from poor families.
- Priority 3: Members from landless poor families.

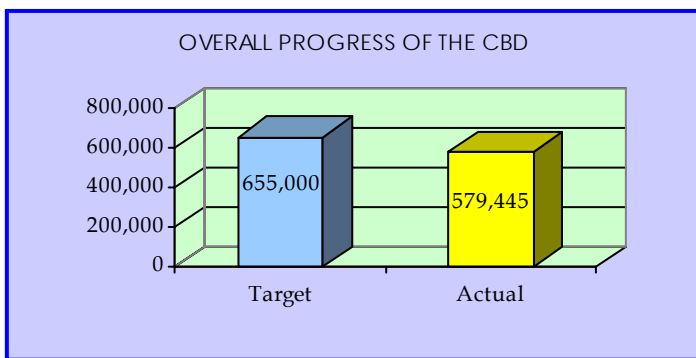


Female villagers are especially encouraged to participate in this process. Members of the CBD platoons are provided with the same training, equipment and gear as the regular platoons. However, when a new Platoon is deployed after training, CMAC attaches technical advisors, taken from the conventional platoons, to the CBD Platoon. When there is confidence that the Platoon is sufficiently experienced, the technical advisors are removed. However, the productivity of a new platoon is usually lower than the target.



Currently 5 CBD platoons are operational in Battambang, Banteay Meanchey and Preah Vihear. Two Platoons were operations since 2005, 1 new platoon was established in March for Austcare Project in Banteay Meanchey, and 2 new platoons joined CMAC under JMAS Project in Battambang. As 3 platoons were new, the total productivity of the CBD Platoons fell below the expected target for the reason already mentioned.

• Area cleared (m <sup>2</sup> )	579,445
• AP mines destroyed	502
• AT mines destroyed	9
• UXO destroyed	240
• Fragments unearthed	1,247,420



## 5.4 TRAINING, RESEARCH AND DEVELOPMENT IN MINE ACTION

### 5.4.1 Training

CMAC's Training Centre (TC), based in Kampong Chhnang Province, is the main training facility which conducts training needs assessment, designs and delivers training courses to improve and enhance technical, medical and management skills, conducts and/or assists with research and development activities, and provides quality assurance services for field operations. Training conducted by TC is sometimes also delivered in other venues, such as at Demining Units, to reflect the field training requirements, and the US Army also organizes training courses at the TC for CMAC and the Army in field specializations. In addition, the Training Centre also houses MDD/EDD training, test and licensing facilities and research and development facilities such as the Explosive Harvesting Program and detector test and evaluation facilities, including deep search. In other words, the Training Centre is a focal point for capacity building and development, quality assurance, research and development and improvement in demining methodology and procedures.

In 2006, the Training Centre conducted 55 training courses participated by 1,003 trainees, which is about half of the total CMAC staff. In addition to training its own staff, CMAC's TC also provides training to external demining organizations. In 2006, CMAC delivered a navigation, mapping and GPS course for 17 Senior Commanders of the Royal Cambodian Engineering Armed Forces. In addition, the US Army from the Pacific Command also delivered courses in minefield management, trauma care and advanced EOD which were participated by CMAC staff and 19 RCAF. The RCAF trainees who participated in this training were expected to be sent to Sudan on the UN mission.

In addition to training, the TC also responds to EOD requests from the communities in Kampong Chhnang areas. In 2006, 11 requests for UXO action were responded, resulting in 785 UXO collected and 581 m<sup>2</sup> of land cleared. The Training Centre also organized and conducted several demonstrations for VIP visitors visiting CMAC activities.

The Training Centre and its products are well-known and recognized as a quality training school in mine action by many external demining organizations as well as international mine action experts. It is also expected to be utilized as a Centre of Excellence in response to the Royal Government's ERW Strategic Plan calling for the establishment of such a centre for ERW training.

The following training courses were conducted in TC during 2006, attended by 1,003 trainees, about half of the total CMAC staff.

SN	Course Title	Start date	End Date	No. of Trainees	Location	Remarks
1	Integrated CMT and MRT into CMC and trained the new SOP and concept	09-Jan-06	14 Jan-06	126	TC	Expertise sections & TC
2	UXO Dog Trial Course # 01	11 Jan-06	29 Dec-06	4	TC	MDD Instructors
3	Basic EOD/MRER Course#12 (MAT)	10-Jan-06	03-Feb-06	26	TC	TC instructors & Expertise sections

4	MDD Refresher Course#28	16-Jan-06	27 Jan-06	17	TC	MDD instructor
5	Basic Brush Cutter Course # 06	16-Jan-06	3 Feb-06	8	BTB-CWS	MMC Officer
6	Basic MRER Course#01 (EOD)	30-Jan-06	3 Feb-06	12	TC	TC EOD instructors
7	Navigation, Mapping and GPS course # 08 for the military in Devision-E70	16-Jan-06	27 Jan-6	17	Sangkat-Chaom Chao	TC instructors
8	MDD Refresher Course#29	06-Feb-06	17 Feb-06	9	TC	MDD Trainers
9	Basic EOD course#13	14-Feb-06	24 Mar-06	20	TC	EOD Instructors
10	Navigation course#08	14-Feb-06	24 Feb-06	25	TC	TC Instructors
11	MDD SOP Review course#01	20-Feb-06	24 Feb-06	7	TC	MDD Trainers
12	MDD Refresher Course#30	27-Feb-06	10-Mar-06	16	TC	MDD Trainers
13	Mine Lap F3 Course#01	01-Mar-06	03-Mar-06	17	TC	TC Trainers
14	MDD Operational handler#01 (SLD)	15-Mar-06	15 Jun-06	14	TC	MDD Trainers
15	MDD Refresher Course#31	18-Apr-06	28-Apr-06	18	TC	MDD Trainers
16	MDD Refresher Course#32	24-Apr-06	05-May-06	9	TC	MDD Trainers
17	MDD Refresher Course#33	17-May-06	30-May-06	18	TC	MDD Trainers
18	MDD Operational handler#02 (LLD)	22-May-06	28-Jul-06	7	TC	MDD Trainers
19	Basic dog handler course#07	22-May-06	22-Aug-06	16	TC	MDD Trainers
20	Minefield management course#01-USA	29-May-06	06-Jun-06	30	TC	US Army (10 pers)
21	MDD Refresher Course#34	29-May-06	09-Jun-06	6	TC	MDD Trainers
22	Mine field management Course#02-USA	5-Jun-06	16-Jun-06	30	TC	10-US army
23	Trauma care course#05	5-Jun-06	16-Jun-06	31	TC	10-US army
24	Advanced EOD Course#01-USA	20-Jun-06	23-Jun-06	11	TC	4-US Army
25	Advanced EOD Course#02	26-Jun-06	28-Jun-06	9	TC	2-US Army
26	CBD Basic Demining Course#03 (124)	20-Jun-06	28-Jul-06	46	TC	TC Trainers
27	CBD Basic Demining Course#04 (125)	3-Jul-06	11-Aug-06	72	TC	TC Trainers
28	Basic Explosive Harvesting Course#01	17-Jul-06	21-Jul-06	4	TC	US Experts
29	Basic Explosive Harvesting Course#02	24-Jul-06	28-Jul-06	4	TC	US Experts
30	Basic Explosive Harvesting Course#03	31-Jul-06	04-Aug-06	4	TC-EHP	US Experts
31	Basic Explosive Harvesting Course#04	07-Aug-06	11-Aug-06	4	TC-EHP	US Experts
32	Basic demolition course#07	07-Aug-06	18-Aug-06	20	TC	TC Trainers
33	Mine Detector Deep Search Course#06	14-Aug-06	18-Aug-06	16	TC	TC Trainers
34	Basic Explosive Harvesting Course#05	14-Aug-06	18-Aug-06	4	TC-EHP	US Experts
35	Basic Explosive Harvesting Course#06	21-Aug-06	25-Aug-06	3	TC-EHP	US Experts
36	MDD Refresher Course#35	14-Aug-06	25-Aug-06	9	TC	MDD Instructors
37	Basic Explosive Harvesting Course#07	28-Aug-06	01-Sep-06	4	TC-EHP	US Experts
38	Basic Explosive Harvesting Course#08	04-Sep-06	08-Sep-06	3	TC-EHP	US Experts
39	Basic Explosive Harvesting Course#09	11-Sep-06	15-Sep-06	4	TC-EHP	US Experts
40	MDD Refresher Course#36	26-Sep-06	05-Oct-06	18	TC	MDD Instructors
41	Basic Explosive Harvesting Course#10	11-Sep-06	15-Sep-06	3	TC-EHP	US Experts
42	MDD operational Course#03	11-Sep-06	11-Nov-06	2	TC	MDD Instructors
43	Basic Explosive Harvesting Course#11	02-Oct-06	06-Oct-06	4	TC-EHP	US Experts
44	MDD Refresher Course#37	09-Oct-06	20-Oct-06	15	TC	MDD Instructors
45	Basic Explosive Harvesting Course#12	09-Oct-06	13-Oct-06	3	TC-EHP	US Experts
46	Basic Explosive Harvesting Course#13	16-Oct-06	20-Oct-06	4	TC-EHP	US Experts
47	Basic Explosive Harvesting Course#14	23-Oct-06	27-Oct-06	4	TC-EHP	US Experts
48	MDD Refresher Course#38	13-Nov-06	24-Nov-06	17	TC	MDD Instructors
49	Basic Explosive Harvesting Course#15	13-Nov-06	17-Nov-06	3	TC-EHP	US Experts
50	Demining Refresher Course#01 for DU4	19-Nov-06	22-Nov-06	207	TC	TC instructors and HQ-Experts
51	Basic Explosive Harvesting Course#16	20-Nov-06	24-Nov-06	2	TC-EHP	US Experts
52	Basic Explosive Harvesting Course#17	27-Nov-06	01-Dec-06	4	TC-EHP	US Experts
53	Basic Explosive Harvesting Course#18	27-Nov-06	01-Dec-06	4	TC-EHP	US Experts
54	Basic Explosive Harvesting Course#19	12-Dec-06	15-Dec-06	4	TC-EHP	US Experts
55	MDD Refresher Course#39	12-Dec-06	22-Dec-06	9	TC	MDD Instructors
<b>Total</b>	<b>55 Courses</b>			<b>1,003</b>		

### 5.4.2 Research and Development

CMAC's TC is currently housing the Explosive Harvesting program (still at research and development stage) supported by the US Government and managed by Golden West in cooperation with CMAC. Explosive harvesting facilities have been constructed and equipped, and work in underway to extract explosives from mines and UXO and reshape or cut them for subsequent field uses. In 2006, this Program produced a significant number of shaped charges and thousands of these charges were distributed to CMAC, Halo Trust and MAG for trial and use. Comments and evaluation from the three operators on the quality of the explosives have been very positive, and the charges have been very useful replacing the imported explosives.



In 2006 also, CMAC carried out a Project for Research and Development of Mine Clearance Related Equipment funded by the Government of Japan. The project was implemented by CMAC in cooperation with Japan International Cooperation System (JICS). The Exchange of Notes for the project was signed on 17 March 2006 between the two Governments. It was a very significant event for CMAC, both in terms of research and development opportunities, widening technical and toolbox management experience and international cooperation.

Three demining machines, three mine detectors (all using ground penetration radar system) and one buggy were selected for test and evaluation in Cambodia. These items were selected based CMAC's standard operations



Komatsu Tiller



Hitachi Flail Push Type



Hitachi Flail Swing Type

requirements as well as promising technology for demining operations. The tests and evaluation of the equipment were conducted in three separate locations. Mine detectors were tested in the CMAC's Regional Centre in Siem Reap (Center for Training and Research & Development in Mine Action and Explosive Remnants of War). Performance and survivability tests of the demining machines were conducted in a rural area about 50 km from Siem Reap town, and the acceptance test tests were finally conducted in two real minefields in Bavel District of Battambang Province. The demining machines were tested to evaluate the performance of the machines under different conditions. For the performance tests, demining machines were tested in three types of lanes: dry, wet and light bush. These lanes had been constructed to resemble the real minefields. The performance tests were conducted with live mines without booster. Survivability tests were conducted against anti-tank mines to measure the extent of damages to the machine and impact on the operator inside the cabin. Acceptance tests were conducted in the real minefields to assess the performance and efficiency of the machines in real operations.



LAMDAR-III GPR System



Gryphon Buggy



ALIS Mine Detector



Mitsui Mine Detector

The mine detectors were tested under dry and wet conditions to evaluate the capability of the detectors to detect and distinguish mines against clutters (metal fragments or other objects which may cause false alarms). These detectors were tested on carefully constructed lanes resembling the soil conditions in various areas of Cambodia. Soils had been brought in from various places such as Kampong Thom, Siem Reap and Banteay Meanchey to represent the different types of soils (sandy, laterite and clay) found in Cambodia. Different types of mines and clutters commonly found in



Cambodia had been buried in test lanes at different depths at least one month prior to the test runs to ensure that detectors were tested to their maximum capability.

Apart from the Project to test and evaluate the Japanese equipment (mine detectors and demining machines), CMAC also conducted test and evaluation of sifting buckets (attached to the current fleet of brush cutters), in conjunction with the US NVESD team, and magnet test in cooperation with ITEP TNO.



### 5.5 SOCIO-ECONOMIC IMPACT

CMAC is not only involved in mine clearance and EOD disposal; it is also very concerned with the socio-economics related to cleared land. In this respect, CMAC fully supports the Royal Government's prioritization process and has been closely working with the Mine Action Planning Unit (MAPU) and other development organizations to ensure that demining produces maximum socio-economic benefits, targets the right population, and the land cleared is geared for those who really need the it. The purpose of this co-operation is to establish effective planning for mine clearance and the use of land cleared by CMAC, thus ensuring maximum socio-economics of land clearance. To achieve this purpose, the responsibility for selection of minefields for clearance has been decentralized to Demining Units who work closely with the provincial authorities (PMAC/MAPU), development NGOs and more importantly with the local communities.

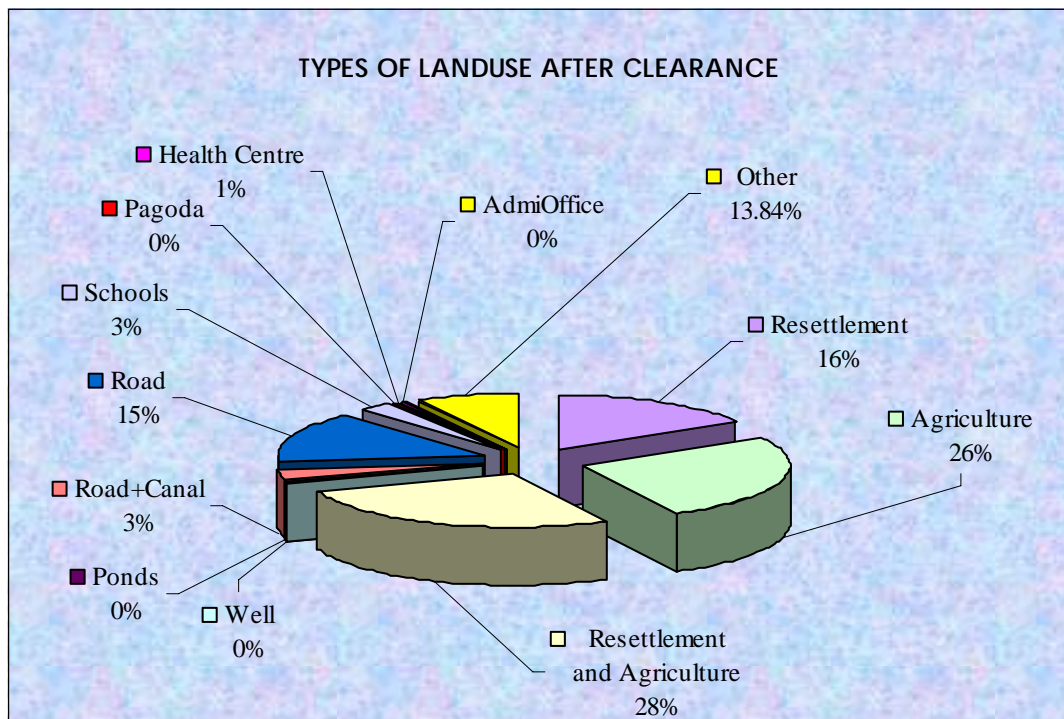
Linking mine action with development is an important consideration, especially in the planning process. This entails that CMAC seriously takes into account development plans and priorities on land cleared. Land selected for clearance must be of high priority in terms of beneficiaries and land use, with particular consideration on agriculture, settlement and infrastructure development, as well as providing opportunities for development agencies to implement their activities in a safe environment.

In 2006, CMAC handed over 585 minefields to the beneficiaries through the local authorities. A total population of 58,874 families and 25,627 students in 234 villages receive socio-economic benefits from land clearance. In terms of post-clearance land use, resettlement and agriculture point out the largest amount of land, 28% of the total cleared land, followed agriculture (26%). The next biggest category of land use goes to resettlement, which takes up 16% of the total land use. These figures explain that the demand for land for resettlement and agriculture, which represent the basic means of survival, is still a critical issue for the Cambodian population, and a high consideration for demining tasks. In a very subtle way, poverty and landmine problem are closely linked, and a large number of civilian population often have to make ends meet on landmine contaminated areas, or minefields. In landmine clearance planning, this factor must be taken into consideration, in response to the Royal Government's effort to reduce poverty. Therefore, in addition to risk reduction, which of course remains a very high priority for Cambodia's mine action sector, fighting poverty through landmine clearance to give safe land for agriculture and development is also critical. In this sense, landmine clearance in Cambodia is not only justifiable for risk reduction, but it explains the great humanitarian and development necessities and produces high returns on investment.

Type of Beneficiaries	TOTAL
Direct Beneficiaries (families)	5,118
Indirect Beneficiaries (families)	53,756
Students	25,627
Beneficiaries villages	234

SOCIO-ECONOMIC DISTRIBUTION OF LAND CLEARED IN 2006			
DEVELOPMENT CATEGORY	Platoon / MDD/ CBD (ha)	Mobile (ha)	TOTAL (ha)
Resettlement	395.02	16.19	411.21
Agriculture	639.49	15.92	655.41
Resettlement plus Agriculture	670.08	11.01	681.09
Wells	0.00	6.17	6.17
Pond	1.18	7.60	8.78
Irrigation, canal, road access	77.25	2.57	79.82
Road portions	328.74	45.31	374.06
School	27.49	36.81	64.31
Pagoda	6.60	4.18	10.77
Health Center	13.05	0.00	13.05
Governmental office	1.00	1.04	2.04
* Others uses	151.93	218.62	370.56
<b>Total</b>	<b>2,311.83</b>	<b>365.42</b>	<b>2,677.26</b>

Note: \* Other Uses: temples, historical sites, construction sites, risk reduction.



### 5.6 OTHER ACHIEVEMENTS

In addition to the survey, marking, mine/UXO clearance, mine risk education and training in mine action achievements, the following achievements were made during the reporting year:

- Operational trial of Explosive Detection Dog (EDD) was conducted from early to December 2006 in both theories and field practice in UXO fields in Kampong Chhnang province to assess and evaluate the practicalities and capabilities of EDD. The EDD is planned to be deploy in real UXO fields in early 2007 to complete the assessment analysis.
- On 10 January 2006, a new Eastern EOD Regional Office (ERO) was established to be a central point of UXO clearance and risk education activities in Kampong Cham province. This Office was established to manage and supervise ERW activities in eastern provinces such as Kampong Cham, Prey Veng, Svay Rieng, Kratie, Stung Treng, Mondul Kiri and Ratanak Kiri to respond to the community requirements for response to explosive remnant of wars in these areas.
- 14 Community Mine Marking Teams (CMMT) and 4 Mine Risk Reduction Teams (MRT) were demobilized and completely converted into 13 Community Mine Clearance Teams (CMC) on 13<sup>th</sup> January 2006 in order to implement a new deployment concept to respond to the field operational requirements and to increase the efficiency and effectiveness in providing quick response to the requests for risk reduction and small scale development by the affected communities. The CMC team concept has proved to be a very effective and efficient mine action tool.
- 6 Mine Awareness Teams (MAT) were reformed and converted into 6 Mine Risk Education and Reduction Teams (MRE) on 17<sup>th</sup> January 2006. The new structure consists of two mine risk education experts and two EOD experts per team in a new and innovative strategy to

integrate mine risk education and EOD response capacity in one team. This multiple-skilled functioning of the team in both provision of mine/UXO risk education and carrying out EOD and limited clearance tasks is an effort to respond to the community requirements on the ground for a more effective risk education and responsive risk reduction at the grassroots level.

- Two new Long Leash MDD teams (LLD#03 & 04) were established on 26<sup>th</sup> June 2006 and deployed at the end of June 2006 in DU2, Battambang province, after they successfully completed training at the Training Centre. The dogs had been brought in from GTC, Bosnia.
- A new Community-Based Demining Platoon (CBD#02) were established, trained and deployed under the Grassroots Project in DU4. The Platoon was deployed on 1<sup>st</sup> February 2006 in Char village, Kantuot commune, Chaom Ksant district, Preah Vihear province.
- A new Community-Based Demining Platoon (CBD#03) was established, trained, and deployed under AUSTCARE Project in DU1. The Platoon was deployed on the first week of August 2006 in Damnak Kokoh village, Svay Chek commune, Svay Chek district, Banteay Meanchey province.
- Two new Community-Based Demining Platoons (CBD#04 & 05) were established, trained and deployed under JMAS Project in DU2. They were deployed on 26<sup>th</sup> August 2006 in Tasen commune, Kamrieng district, Battambang province.
- In May 2006, CMAC received 4 types of multi-tool sifters (REMU Bucket-for draining soil type, Rotary Riddle-for draining soil type, VTN Bucket-for draining soil type and VANE Bucket-for rake soil type) from US Night Vision. These multi-tool sifters were assembled and attached to BC#27 to provide training to CMAC's BC operators on how to use, maintain and operate in effectively in the minefields. A trial of these sifters was conducted at DU1 (Banteay Meanchey) for 10 days from 17-27<sup>th</sup> October 2006 in the cleared minefield to assess and evaluate their effectiveness, quality and productivity before allowing deploying to the real minefields. The trial was a successful and the sifters were recommended for application in CMAC's operations.
- The Manual SOP-100 (Techniques and Safety SOP) was reviewed to reflect the changes of minefield situation and practical operations.
- Operations & Planning Department still maintained ISO 9001:2000 in quality management.

## PROJECT MANAGEMENT

In 2006, CMAC implemented a number of projects. 2006 was also the first year that CMAC executed the UNDP's "Clearing for Results" as the UNDP Trust Fund came to a conclusion at the end of 2005. The Clearing for Results Project marks another stage of development in the management of mine action in Cambodia and shows the maturity of mine action in this heavily-mined country. In addition, a number of bilateral projects, most of them on-going or renewed from 2005, were executed. It should also be noted that contractual services also play a greater role in funding contribution to CMAC's operations.

### CLEARING FOR RESULTS PROJECT

#### Project Background

The Clearing for Result Project was initiated by UNDP and the Royal Government of Cambodia to redefine its partnership strategy in managing donor funding. The new partnership strategy is output-based, meaning that the Project's achievements will be primarily measured in terms of productivity, efficiency, and socio-economic returns. This clearly shifts the focus from process management to result management. This partnership strategy also calls for competitive bidding for mine action resources when there is a reliable and transparent bidding process in place. However, at this stage, UNDP has awarded CMAC as its implementing partner of the Clearing for Results Project through a comprehensive evaluation of all demining operators in Cambodia.

The new initiative immediately drew attention of three major donors, namely Australia, Canada and UNA-USA's Adopt-A-Minefield, to support the Project. The Australian Government made an initial contribution of 2 million Australian dollars to kick off the project, and lately confirmed their longer-term commitment to this Project with a total amount of 12 million Australian dollars from 2007 to 2010. The Canadian Government has also committed 7.1 million Canadian dollars to

support the Clearing for Results Project from 2006 to 2010. The other major donor for Clearing for Results Project is UNA-USA's Adopt-A-Minefield, who contributes around half a million US dollars. At the same time, Spain has also indicated their willingness to support the Project from 2007. In 2006, CMAC received a total of 3,450,000 US dollars from UNDP for Clearing for Results Project.

#### Resource Deployment



A number of teams were deployed to support the Project "Clearing for Results" in order to deliver the intended outputs stipulated in the Project Work Plan between UNDP and CMAC. Since the project focused on outputs, CMAC had a greater flexibility in managing demining toolboxes to deliver the agreed outputs. The resources were mainly deployed in the provinces of Pursat, Battambang and Banteay Meanchey, based on the priority selection by the local communities and approval by the provincial authorities (PMAC/MAPU).

Teams deployed included mobile platoons, MDD teams, EOD teams, CMC teams, MRE teams, Brush Cutter teams and the CBMRR/CBURR. These teams were deployed to support mine/UXO clearance, technical survey, mine and UXO risk education. It should be noted that most of the resources were deployed to clear minefields in 47 villages, 29 communes and 13 districts of the said provinces. These minefields were selected by the local communities and approved by the provincial authorities through the PMAC/MAPU process.



However, flexibility within the work plan with UNDP was also given to quick interventions for risk reduction in response to the community needs.

## Achievements

CMAC deployed a number of MRE and EOD teams assisted by the CBMRR and CBURR networks as part of its strategy to reduce risks to the communities where such risks pose formidable threats to the communities. During the reporting period, these teams collected and destroyed a total of 2,932 anti-personnel mines, 106 anti-tank mines and 29,345 UXO, in addition to 75,727 m<sup>2</sup> of area cleared for the safety of the people in the high risk communities. These interventions produced a very significant impact on risk reduction and helped address immediate safety issues faced by the communities.

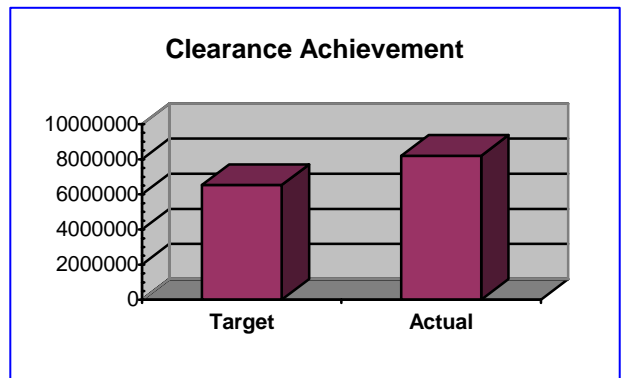
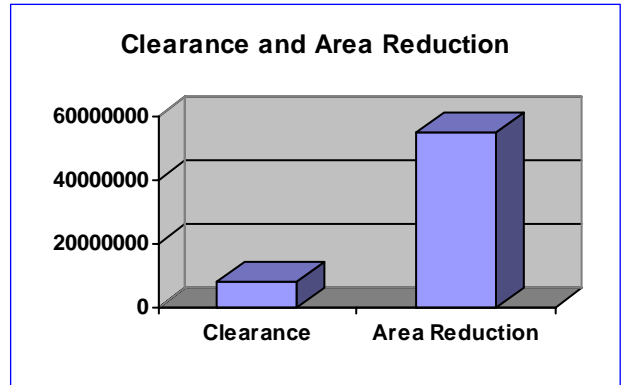
Teams	Household visited	Course	Participants			Task Request			Task Response		
			Man	Women	Children	Request	Mine	UXO	Tasks	Mine	UXO
MRE	5719	215	7,580	9,354	14,729	396	581	2,486	396	581	2,486
CBMRR	11673	0	17,046	18,880	15,471	585	2,789	4,883	585	2,789	4,883
CBURR	5439	734	8393	7,203	7,762	525	128	5,416	525	128	5,416
<b>TOTAL:</b>	<b>22,831</b>	<b>949</b>	<b>33,019</b>	<b>35,437</b>	<b>37,962</b>	<b>1,506</b>	<b>3,498</b>	<b>12,785</b>	<b>1,506</b>	<b>3,498</b>	<b>12,785</b>

Collection and destruction of these ERW items is one thing, but creating confidence among the affected communities is another. The MRE teams and CBMRR/CBURR worked closely with the communities to understand their needs and convey their requests for EOD response. In 2006 alone, these resources conveyed a total of 1,505 requests, all of which were responded by CMAC intervention teams. In addition, these teams and networks visited a total 22,831 households, participated by some 106,418 people, including 37,962 children.

CMAC realizes that minefield information is a crucial tool to effective demining and land release (area reduction). In response to the Royal Government's call for accelerated area reduction, together with the requirement for clearer and more reliable minefield information, CMAC sees its technical survey tool as the right tool to achieve this dual purpose. Also in this respect, CMAC changed its technical survey concept, that both reflects the changing need and the reality in the field.

With the new concept executed from the middle of the reporting year, CMAC achieved a significant output compared to the humble area reduction target it set at the beginning of the year. So instead of achieving the 5.8 km<sup>2</sup> target of area reduction, CMAC achieve ten fold the target, which puts the area reduction figure at 54,895,200 m<sup>2</sup>. This was concentrated in Battambang where huge contamination areas are very common through this rich-soil province. In addition, CMAC also marked 934,118 m of land to indicate cleared or uncleared areas.

During the twelve-month period of the reporting year, the clearance productivity of the Project reached a total of 8,201,334 m<sup>2</sup> (against the target of 6,534,810m<sup>2</sup>). This is a very high output compared to the target, and it clearly indicates CMAC's commitment to efficiency, determination and contribution to risk reduction and development. The overall number of items recovered and neutralized was also remarkable: all teams found and destroyed a total of 9,902 anti-personnel mines and 190 anti-tank mines, and 30,667 UXO and 1,117 kgs of small calibers were collected and demolished. This output level compared with the costs of operations keeps CMAC one of the most efficient and competitive demining operators in Cambodia and worldwide.



**Socio-Economic Impact**

The output of the Clearing for Results Project benefited 1,579 families directly and 27,117 families indirectly in 152 villages vulnerable to risks and threats from landmines and UXO, and 22,278 students who had constantly been exposed to threats as they had landed in the wrong areas with their families could enjoy freedom of safe movements in their local areas thanks to this Project. As the end result, 228 former contaminated locations were turned to productive use for development, resettlement, and other livelihood and community rehabilitation purposes.

In theory and based on past incident and casualty reports, the removal and demolition of 9,902 anti-personnel mines from the contaminated ground may indicate that at least 9,902 lives could be literally saved, and the collection and destruction of 30,667 UXO may save up to 153,335 lives and limbs from potential deaths or injuries. In other words, it could be assumed that the grant of USD 3,450,000 through the Clearing for Results Project in 2006 could potentially save 163,237 people.

This does not yet consider the suffering and other social and economic impacts caused to the immediate families and children of the victims as a result of these incidents and casualties. The Project also turned 8,201,334 m<sup>2</sup> of former minefields into productive use, be it resettlement, agriculture or other development, and benefit thousands of needy people.

## **BILATERAL PROJECTS**

Projects directly signed between CMAC and donors or development partners are called bilateral projects. In 2006, CMAC executed 14 bilateral projects and 6 contractual services contracts.

### **Summary of Bilateral Projects Executed in 2006**

<b>PROJECT TITLE</b>	<b>DONOR/PARTNER</b>	<b>PROJECT LOCATIONS</b>
The Integrated Demining and Development Program	Netherlands/NPA Cambodia	DU1, Banteay Meanchey
Integrated Mine Action and Development Program	Australia/Austcare	DU1, Banteay Meanchey
The Project for Supporting Humanitarian Demining Activities in Battambang Province	Grassroots-Japan	DU2, Battambang
The Community-Based Demining (CBD)	Japan/JMAS	DU2-Battambang
Humanitarian Mine Action Project	USA	DU3, Pailin and Samlot (Battambang)
The Project for Supporting Humanitarian Demining Activities in the Provinces of Kampong Thom, Oddar Meanchey and Preah Vihear	Grassroots-Japan	DU4, Kampong Thom, Preah Vihear and Oddar Meanchey
Mine/UXO Clearance for Access Road from Koh Ker to Kampich Village	Peace Boat, Japan	DU4, Preah Vihear
Humanitarian Demining	Germany	DU6, Siem Reap & Oddor Meanchey
The Research and Development of Mine Clearance related to Equipment	Japan/JICS	Siem Reap/Battambang
UXO Clearance Activities and CBURR Project	Japan/JMAS	Prey Veng, Svay Rieng & Kandal
UXO Clearance Activities and CBURR Project	Japan/JMAS	Kg. Speu, Kampong Cham, Prey Veng, Svay Rieng & Kandal
Graduate Exchange/Internship Program	NPA	CMAC HQ and Training Centre (Kg. Chhnang)
Explosive Harvesting Program (EHP)	USA/Golden West	CMAC Training Center (Kg. Chhnang)
Provision of MDD and Technical Assistance	NPA/GTC-Bosnia	CMAC Training Centre (Kg. Chhnang)

### **CONTRACTUAL SERVICE UNIT:**

<b>PROJECT TITLE</b>	<b>DONOR/PARTNER</b>	<b>PROJECT LOCATIONS</b>
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Battambang and MAG targeted zone
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Samlot, Ratanak Mondul, (Battambang) and Pailin
Hire of One Mine Detection Dog (MDD) team from CMAC	MAG	Preah Vihear and MAG targeted zone
SEA-UNION CONSTRUCTION (Cambodia) Co. Ltd	Private Company	HQ-Phnom Penh
Liberty Mining International (LMI) Pty Ltd	LMI	Ratanakiri province
The Cambodian Airport Management Service	Phnom Penh Airport	HQ-Phnom Penh

### **1. CMAC– NPA PROJECT IN DEMINING UNIT 1, BANTEAY MEANCHEY: The Integrated Demining and Development Program**



## 1.1. Project Background

This project is supported by the Netherlands through the Norwegian People's Aid in Cambodia (NPA), implemented by CMAC Demining Unit 1 in Banteay Meanchey Province, with an amount of USD 2.5 millions to support a 4-year Integrated Demining and Development Program in Northwest Cambodia. The project period runs from May 2004 to December 2007. During the reporting period from January to December 2006 following resources were mobilized.

- Demining Unit1 Office (21 persons)
  - 4 Mobile Demining Platoons (120 persons)
  - 2 Technical Survey for Clearance Tasks teams (10 persons)
  - 2 Explosive Ordnance Disposal teams (6 persons)
  - 2 Mechanical Brush cutter teams (12 persons)
  - 1 Mine Risk Education and Reduction Team (4 persons)
  - 4 District Focal Point teams of Community based mine risk reduction (4persons)
- Total personnel employed by project: 177 persons.

The project's goal is to bring about personal security to communities living in mines affected area in O'Chrov and Malay district, Banteay Meanchey province in order to enable them to increase their socio-economic opportunities and to facilitate the safety of resettling rural communities threatened by mines and UXOs, thereby enabling national and international development agencies to carry out the development activities in the target area, specifically to support NPA resettlement project.



## 1.2. Project Activities and Achievements

As stated in IWP 2006, the expected outputs of the project were to clear 1,776,000m<sup>2</sup> of contaminated land. All project resources were mainly deployed at O'Chrov and Malay District of Banteay Mean Chey, which are highly contaminated by mines/UXO.

During 12 month period from January to December 2006, the project cleared a total area of 1,795,336m<sup>2</sup>, marked 191,973 linear metres, found and destroyed 9,079 anti-personnel mines, 281 anti-tank mines, 9,559 UXO, 1,079 kgs of small calibers, and 3,062,293 fragments were detected.



Resources	Progress								
	Area cleared (m <sup>2</sup> )	Cutting (m <sup>2</sup> )	Excavation (m <sup>3</sup> )	Linear metres marked	AP Mine	AT Mine	UXO found	Small calibers (kgs)	Fragments
4 MP	1,187,074	0	0	0	3,923	82	427	0	2,870,322
2 small TST	77,828	0	0	191,973	20	0	15	0	17940
2 BC	493,149	554,473	25,029	0	2,013	10	69	0	172,965
2 EOD	31,004	0	0	0	2,695	189	8,369	1,052	1,066
1 MRE	6,281	0	0	0	428	0	679	27	0

Total	1,795,336	554,473	25,029	191,973	9,079	281	9,559	1,079	3,062,293
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In addition to clearance and marking, the project also carried out risk education activities by conducting 1,823 sessions of mine awareness presentation with 36,411 people from 7,625 households in 129 villages. At the same time, the CBMRR networks conducted 1,736 presentations reaching 5,617 households of 29 villages with the participation of 18,855 audiences.

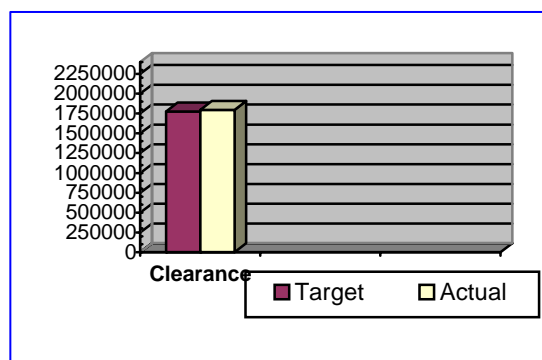
Demining Components	Household	Session/ Presentation	Village visited	People involved	Mines/UXOs reported
MRE	2,008	87	100	17,556	0
CBMRR	5,617	1,736	29	18,855	2,897
<b>Total</b>	<b>7,625</b>	<b>1,823</b>	<b>129</b>	<b>36,411</b>	<b>2,897</b>

### 1.3. Socio-Economic Impact and Analysis

The area cleared was handed over to the local authorities to be used by the local population and infrastructure development such as roads, agriculture, canals and resettlement. The total cleared area benefits 4,318 families and 250 students.

Actual clearance of 1,795,336m<sup>2</sup> shows an over-performance of 1% compared to the target of 1,776,000m<sup>2</sup>. In general, productivity level of the project represents 8% during the 12 -month period against total CMAC clearance work plan for 2006.

The removal and demolition of 9,079 anti-personnel mines from the contaminated ground may indicate that 9,079 lives could be saved, and the collection and destruction of 9,558 UXO may save up to 47,790 lives and limbs from potential deaths or injuries. As a result, it could be assumed that the grant of USD 630,000 in 2006 can save 56,869 people lives and release 1,795,336m<sup>2</sup> confirmed as safe land for 4,318 families of vulnerable people, who are threaten by landmines and UXO.



## 2. CMAC-JAPAN KUSANONE PROJECT IN DEMINING UNIT 2:

### The Project for Supporting Humanitarian Demining Activities in Battam Bang Province, Phase III

#### 2.1. Project Background

This project has been supported by the Government of Japan under the Japanese Grant Assistance for the Grass-root Project (KUSANONE) with amount of USD 917,593 to support one year demining operation implemented by CMAC Demining Unit 2, Battambang Province, which is one of the most mine/UXO affected provinces with a high

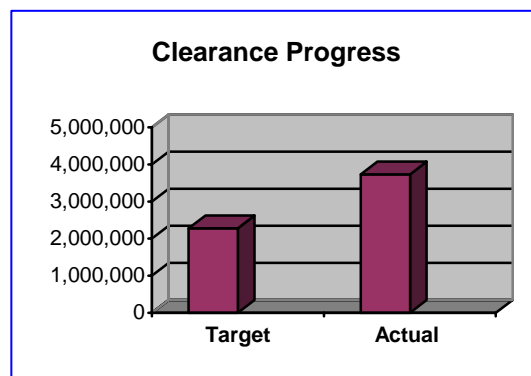


casualty rate. This project started from January to December 2006 with following resources:

- 5 Mobile Platoons (150 persons)
  - Technical Survey Small Teams (10 persons)
  - Explosive Ordnance Disposal Teams (6 persons)
  - 1 Mine Detection Short Leash Dog Team (SLD) (10 persons)
  - Brush Cutters (24 persons included 4 deminers)
- Total Project Staff: 200 persons

## 2.2. Project Activities and Achievements

During the project period of 2006, all project resources of Demining Unit 2 were mainly deployed in high affected districts such as Ratanakmondul, Mong Russey, Koh Kralor, Sampov Loun, Kam Reang, Bovel and Phnom Preuk districts of Battambang. As highlighted in IWP 2006, the plan of the project is to clear 2,274,000 m<sup>2</sup> of contaminated land during the period for one year from January to December 2006.



In 12 month period, the project achieved land clearance of 3,733,743 m<sup>2</sup>, marked 94,106 linear metres, and found/destroyed 5,545 anti-personnel mines, 328 anti-tank mines and 13,255 UXO.

Resources	Progress								
	Area Cleared (m <sup>2</sup> )	Cutting (m <sup>2</sup> )	Excavation (m <sup>3</sup> )	Marking (m)	AP Mines	AT mines	UXO	Small Calibers (kgs)	Fragments
5MP	2,199,812	0	0	0	1,546	163	1,012	0	2,614,202
2 TST5	68,894	0	0	94,106	0	0	0	0	10,806
2 EOD	15,585	0	0	0	2,817	144	11,984	535	0
1 SLD	290,324	0	0	0	25	9	24	0	2,953
4 BC	1,159,128	1,284,999	2,328	0	1,157	12	235	0	252,948
<b>Total</b>	<b>3,733,743</b>	<b>1,284,999</b>	<b>2,328</b>	<b>94,106</b>	<b>5,545</b>	<b>328</b>	<b>13,255</b>	<b>535</b>	<b>2,880,909</b>

## 2.3. Socio-Economic Impact and Analysis

During 12 month period from January to December 2006, 48 minefields were completed, benefiting 405 students and 2,615 families for access to roads, schools, resettlement, pagoda, and small scale agriculture areas as well as other areas which impacted by other non-clearance activities such as EOD, mine risk education, and survey and marking.

The productivity of clearance (3,733,743 m<sup>2</sup>) increased sharply, i.e. 64.2% surplus, compared to one year target of 2,274,000 m<sup>2</sup>.

In general, project's productivity represents 16.7% during the 12 month period against the CMAC Work Plan 2006.



Demolition of 5,545 anti personnel mines and 13,255 UXO could be interpreted as 5,545 lives and 66,275 lives have been respectively saved and spared. In short, the grant of USD 917,593 can save 71,820 people lives and release 3,733,743 m<sup>2</sup> of land for 2,615 families and 405 students, who were under the threat of landmines and UXO.

By simple mathematical calculation, cost per square meter is USD0.24 in term of clearance only. This cost does not take into account the many other values added activities for example UXO demolition work, marking, survey,...etc. With these activities included in the calculation, the cost could again go well below USD 0.24.

### 3. CMAC-USA PROJECT IN DEMINING UNIT 3, PAILIN: Humanitarian Mine Action Project in Pailin and Samlot, Cambodia

#### 3.1. Project Background

This project has been supported by the Government of the United States of America since 1999 till today for the demining operations implemented by CMAC Demining Unit 3 based in Pailin and Samlot district of Battambang where are the most heavily mine/UXO affected municipality and province with the highest casualty rate in the country.

From 15 May 2005 to 14 May 2006 US Department of State has agreed to support CMAC DU3 with total amount of USD USD 1,864,541.73 (12-month period) and for the current project has been starting from June 2006 to May 2007 with total amount of USD1,850,000 for the period of 12 months for continuing from the previous expired project with the following resources:

- 1 Demining Unit HQ: DU3 (21personnel)
  - 9 Mobile Demining Platoons for 9-month = 270 personnel and 10 platoons for 3-month from October to December 2006 (300 personnel)
  - 3 Mine Detection Dog Teams (27 personnel)
  - 4 Brush cutter (24 personnel)
  - 2 Explosive Ordnance Disposal Teams (EOD) (6 personnel)
  - 4 Technical Survey Small Teams (TST5) (20 personnel)
  - 1 Technical Survey Large Teams (TST10) (10 personnel)
  - 2 Community Mine Clearance Teams (CMC) (18 personnel)
  - 1 Mine Risk Education and Reduction Team (MRER) (4 personnel)
  - 5 Community Based Mine Risk Reduction Team
- Total project personnel: 435 persons

*Note: In this report CMAC is going to capture the figures from January to December 2006 of the project framework, which has currently been finished and keep continuing in 2007. The project resources covered the following main input:*

- 1 Demining Unit HQ: DU3 (21personnel)
  - 9 Mobile Demining Platoons (271 personnel)
  - 4 Technical Survey Small Teams (20 personnel)
  - 3 Mine detection dogs (27 personnel)
  - 1 Technical Survey Large team (10 personnel)
  - 4 Brush cutter (24 personnel)
  - 2 Community Mine Clearance teams (18 personnel)
  - 2 Explosive ordnance disposal (6 personnel)
  - 1 Mine Risk Education Reduction (4 personnel)
  - Community Base Mine Risk Reduction (4 personnel)
  - Short Service Agreements staff (25 personnel)
- Total project personnel: 430 personnel

The goal of this project is to bring about personal security to communities living in mine-affected districts and to reduce suspected mine-contaminated areas.

- To bring about personal security, better socio-economic opportunities to communities living in mines/UXO affected areas chosen in consultation with all the concerned authorities and local communities.
- To support national and international development agencies' efforts to carry out development activities in the target areas in collaboration with CMAC.



### 3.2. Project Activities and Achievements

From January to December 2006, a surface clearance 4,900,725 m<sup>2</sup> was achieved and 641,949 linear meters of minefield boundary was marked for risk reduction. During this period, 7,066 anti-personnel mines, 61 anti-tank mines, 9,978 UXO and 468 kg of small calibers were found and destroyed; and 8,766,695 fragments were unearthed.

Resources	Progress								
	Area cleared (m <sup>2</sup> )	Cutting (m <sup>2</sup> )	Excavation (m <sup>3</sup> )	Linear metres marked	AP Mine	AT Mine	UXO found	Small calibers (kgs)	Fragments
9 MP	3,179,921	0	0	0	1,437	9	1,617	0	7,909,250
4 small TST	158,040	0	0	324,202	35	0	44	0	97,764
4 BC	610,036	1,334,211	38,305	0	1,701	9	505	0	446,007
2 CMC	186,586	0	0	9,270	108	0	96	0	278,152
1 Large TST	49,011	0	0	308,477	130	1	94	0	22,288
3 SLD	681,519	0	0	0	184	0	185	1	13,108
2 EOD	26,810	0	0	0	2,893	41	6,322	467	126
1 MRE	8,802	0	0	0	578	1	1,115	0	0
<b>Total</b>	<b>4,900,725</b>	<b>1,334,211</b>	<b>38,305</b>	<b>641,949</b>	<b>7,066</b>	<b>61</b>	<b>9,978</b>	<b>468</b>	<b>8,766,695</b>

In addition to clearance and marking, the project also carried out risk education activities made by MRE and CBMRR networks achieved as follows.

Demining Components	Household visited	Session/ Presentation	Village visited	People involved	Mines/UXO reported & Responded
1 MRE	1,596	61	70	6,813	1,694
4 CBMRR	6,855	0	30	25,912	2,188
<b>Total</b>	<b>8,451</b>	<b>61</b>	<b>100</b>	<b>32,725</b>	<b>3,882</b>

Another significant milestone of this project to note is the technical survey. In response to the Royal Government's call for accelerated area reduction, together with the requirement for clearer and more reliable minefield information, CMAC sees technical survey as the most appropriate tool to meet these requirements. Due to the fact that Pailin is one of the most heavily contaminated areas in Cambodia and because of the manageable physical size of the area, CMAC started to conduct a comprehensive technical survey in the whole Pailin in order to map out the contamination problem of this once hot battle area. In 2006, CMAC deployed two technical survey teams in Pailin, one under the US-CMAC Project and one under the UNDP's Clearing for Results Project, and reduced a total area of 114,553,300 m<sup>2</sup> off the Level One Survey Contamination records in Pailin. Since the deployment of technical survey teams in Pailin

in 2003 up to the end of 2006, CMAC completed technical survey in 30 villages out of total 79 villages in Pailin, and in 2006 alone CMAC completed 26 villages thanks to the change in technical survey methodology and process. There are 49 villages to be surveyed in 2007, and CMAC plans to complete all the villages in Pailin by the end of 2007. When this is achieved, the technical survey will reveal how much the area is contaminated and which areas are clean or pose less threats to the communities and development. This will make mine clearance operations in Pailin more effective, efficient and productive.



### 3.3. Socio-Economic Impact and Analysis

During 12 month period from January to December 2006, it could be confirmed that 56,531 families of vulnerable people and 718 students who are threatened by landmines and UXO could benefit from this mine clearance activities in 90 minefields in 58 villages of Pailin and Samlot district of Battambang province for supporting development and construction of roads, resettlement, agriculture, school and other official uses as requested.

The clearance productivity during this reporting period from January – December 2006 achieved by 4,900,725m<sup>2</sup> equal to 85.17% compared to the total 5,754,000m<sup>2</sup> of annual clearance target set in IWP 2006. This was due to the fact that some teams were not deployed as set out in the work plan. The table below illustrates the comparison between the project's IWP target input 2006 and actual resources deployment during this reporting period from January – December 2006.

Description	Progress									
	MP	CMC	BC	TST (Big)	TST (Small)	MDD	EOD	MRE	CBD	CBMRR
Actual deployment 2006	9	2	4	1	4	3	2	1	0	4
IWP target input 2006	9	2	6	2	4	3	3	1	3	5
<b>Comparison</b>	<b>0</b>	<b>0</b>	<b>-2</b>	<b>-1</b>	<b>0</b>	<b>0</b>	<b>-1</b>	<b>0</b>	<b>-3</b>	<b>-1</b>

In addition, the removal and demolition of 7,066 anti-personnel mines from the contaminated land may indicate that 7,066 lives could be saved and larger damages of communities' properties could be rescued on time due to an un-explosion of 61 AT mines had been taken in places, and the collection and destruction of 9,978 UXO may save up to 49,890 lives and limbs from potential deaths or injuries. As a result, it could be confirmed the project can save 56,956 people lives and released 4,900,725m<sup>2</sup> confirmed as safe land for vulnerable people who are threatened by landmines and UXO.

## 4. CMAC-JAPAN KUSANONE PROJECT IN DEMINING UNIT 4: The Project for Supporting Humanitarian Demining Activities in the provinces of Kompong Thom, Oddar Meanchey and Preah Vihear

### 4.1. Project Background

This project was signed on 25 October 2005 between H.E. Khem Sophoan, CMAC Director General, and H.E. Takahashi Fumiaki, the Ambassador of Japan in the Kingdom of Cambodia, and was witnessed by H. E. Sok An- Deputy Prime Minister, the Minister in charge of the Council of Ministers. The intended purpose of this project is to support humanitarian demining activities

in the provinces of Kompong Thom, Oddar Meanchey and Preah Vihear during the period of one year from October 2005 with the total costs of USD 919,099. The following resources were mobilized under the project.

- 01 Office supported Staff, proposed 27 persons, but the actual 20 only
  - 06 Mobile Platoons "MP" consists of 180 persons, but the actual 05 Mobile Platoon consists of 150 person is due 1 MP move to DU since January 2006
  - 01 Community Base Demining "CBD" Consists of 32 persons
  - 04 Brush Cutter proposed 24, but actually 3 BC consist of 18 persons
  - 01 EOD team proposed 3 staff, but actually 2 EOD consists of 6 Persons
  - 01 Short Leash of Mine Detection Dog team "MDD" consists of 9 persons
  - 01 Community Mine Marking "CMT" consists of 5 persons, actually CMT was reformed as Community Clearance team "CMC" since January 2006 consists of 9 persons
  - 01 Mine Risk Education Reduction team "MRER" Consists of 4 persons
  - 02 Technical Survey small Teams "TS5" consist of 10 persons
- Total personnel of the project resource is 258 persons

The goal of this project is to bring about personal security to the people and communities living in mines/UXO - affected area, and to reduce the number of mines/UXO casualty towards zero victim in Kompong Thom, Oddar Meanchey and Preah Vihear Provinces.



The objectives of the project are:

- To gradually move towards zero mine/UXO accidents in the target areas through mine/UXO clearance, risk education and reduction
- To focus on archeological sites and ancient temple areas for clearance to enable road construction, safe passage and open the sites for tourism, which will eventually generate income and economic opportunities for the people in the areas
- To provide the target communities with safe access to resources to facilitate their socio-economic and infrastructure development. In this context, local communities will set the priorities in line with their local development requirements
- To support national and international development efforts to carry out development activities in the target areas in collaboration with CMAC
- To ensure sound financial, logistics, human resources and operational management in order to maintain effectiveness and efficiency as well as donor confidence at all times



## 4.2. Project Activities and Achievements

The project resources of Demining Unit 4 were mainly deployed in high affected districts such as Choam Ksant, Chey Saen, Chhaeb, Kuleaen, Rovieng, Tbeng Meanchey, Sangkum Thmey districts of Preah Vihear province, and Prasat Balangk, Prasat Sambour, Kampong Svay, Santuk, Steung Saen districts of Kampong Thum province and Trapeang Prasat district of Oddar Mean Chey province. The aim of the project is to clear 2,556,000m<sup>2</sup> of highly contaminated land.

Based on the project proposal, the progress report should be started to illustrate its achievements from October 2005 to October 2006. However during the period from November to December 2006, the resources of the project were provided with demining refresher training at the CMAC Training Centre in Kampong Chhnang.

Cleared land of 4,819,741 m<sup>2</sup> was achieved +88.56% higher than the set target of 2,556,000m<sup>2</sup>, 130,561 linear metres was marked, and 1,388 anti-personnel mines, 28 anti-tank mines and 10,932 UXO were found and destroyed. The table below is the detailed productivities made by the various demining tool boxes of CMAC DU4 implemented in the period from October 2005 to October 2006.

Resources	Progress								
	Area cleared (m <sup>2</sup> )	Cutting (m <sup>2</sup> )	Excavation (m <sup>3</sup> )	Linear metres marked	AP Mine	AT Mine	UXO found	Small caliber (kgs)	Fragments
5 MP	3,356,876	0	0	0	942	0	943	0	2,589,823
2 small TST	145,981	0	0	128,287	17	0	39	0	39,888
3 BC	772,169	1,250,546	4,400	0	45	0	146	0	265,185
1 CMC	85,852	0	0	2,274	10	0	61	0	60,724
1 CBD	177,236	0	0	0	26	0	161	0	624,025
1 SLD	233,741	0	0	0	21	0	126	0	36,255
2 EOD	39,039	0	0	0	283	23	8,176	44	0
1 MRE	8,847	0	0	0	44	5	1,280	714	0
<b>Total</b>	<b>4,819,741</b>	<b>1,250,546</b>	<b>4,400</b>	<b>130,561</b>	<b>1,388</b>	<b>28</b>	<b>10,932</b>	<b>758</b>	<b>3,615,900</b>

In addition to clearance and marking, the project also carried out risk education activities made by MRE team by 2,998 household visit, 152 session of presentation, 152 villages reached the total 18,560 audiences.

## 4.3. Socio-Economic Impact and Analysis

68 minefields were completed and handed over to the local communities of 22,238 families and 580 students for the purposes of resettlement, agriculture, road construction, school, canal, pagoda, health centre, sport site, temple and tourist places.

The productivity of clearance shows a positive trend, 4,819,741 m<sup>2</sup> with a surplus of +88.56%, compared to the target of 2,556,000m<sup>2</sup>. Productivity of the project during 12 months, in general, represents 21.5 % of the CMAC Work Plan 2006.

In humanitarian and socio-economic terms, the demolition of 1,388 anti-personnel mines and 10,932 UXO mines could be interpreted as saving an approximate 56,048 lives and limbs by preventing these mines and UXO from causing the accidents. In short, the grant of USD 919,099 during 12-month period could have saved 56,048 people's lives and release 4,819,741 m<sup>2</sup> of land for 22,238 families and 580 students, who were under the threat of landmines and UXO.



## 5. CMAC – GERMANY PROJECT AT DEMINING UNIT 6: Humanitarian Demining in Siem Reap and Oddar Meanchey Provinces

### 5.1. Project Background

The project has been supported by the Federal Republic of Germany with an amount of USD 1,058,451 to support demining operation carried out by CMAC Demining Unit 6 Siem Reap for the period from January to December 2006 with the following resources:

▪ Project Manager	:	01 person
▪ Demining Unit 6 Headquarters	:	18 persons
▪ EOD Supervisor	:	1 persons
▪ Demining Site# 13 – (Site support staff)	:	05 persons
▪ 6 Normal & Mobile Platoons (NP)	:	186 persons
▪ 2 EOD teams	:	6 persons
▪ 2 Technical Survey Small Teams (TST)	:	10 persons
▪ 1 Community Mine Clearance Team (CMC)	:	10 persons
▪ 2 Brush Cutters	:	4 persons
▪ Special Service Agreement Staff (SSA)	:	20 persons

Total personnel funded by the Federal Republic of Germany: 261 staff

The goal of the Project is to provide a safe land for the resettlement, infrastructure, Health Centers, Schools, and safety for tourists to access to the archeological temples, and to contribute to the mine/UXO casualty reduction.

### 5.2. Project Activities and Achievements

The work plan of the project is to clear 1,884,000m<sup>2</sup> of highly mine and UXO affected communities in 2006, benefiting 2,000 families for resettlement, agriculture, road and school construction, Health Centers, safety for tourists to access to the archeological temples and other public service facilities.

During the operational period from January to December 2006, the project resources of Demining Unit 6 funded by the Federal Republic of Germany were deployed in Siem Reap, Prasat Bakong, Pouk, Srei Snam, Angkor Thom, Banteay Srey, Sotr Nikum, Svay Leu, of Siem Reap province and Chongkal, Banteay Ampil, Samraong, Trapeang Prasat and Anlong Veng of Oddar Meanchey province.



In the 12 –month- period, 3,093,891m<sup>2</sup> were cleared and handed over to local communities. 1,848 anti-personnel mines, 48 anti-tank mines and 8,195 UXO were found and destroyed. Furthermore, 43,926 linear meters have been marked for risk reduction and 1,080,814m<sup>2</sup> of cutting and 1,950m<sup>3</sup> of excavation the beam of soil.

Resources	Progress								
	Area cleared (m <sup>2</sup> )	Cutting (m <sup>2</sup> )	Excavation (m <sup>3</sup> )	Linear metres marked	AP Mine	AT Mine	UXO found	Small calibers (kgs)	Fragments
6 MP	2,411,351	0	0	0	1,236	7	1,427	2	805,113
2 small TST	243,985	0	0	29,280	36	2	42	0	24,726
3 BC	0	1,080,814	1,950	0	0	0	19	0	0
1 CMC	420,794	0	0	14,646	21	1	259	0	24,028
2 EOD	17,761	0	0	0	555	38	6,448	518	0
<b>Total</b>	<b>3,093,891</b>	<b>1,080,814</b>	<b>1,950</b>	<b>43,926</b>	<b>1,848</b>	<b>48</b>	<b>8,195</b>	<b>520</b>	<b>853,867</b>

### 5.3. Socio-Economic Impact and Analysis

In the 12 month period, 120 minefields in both provinces were cleared and handed over to the communities and local authorities of 13,343 indirect families and 1,906 students in both provinces for the purposes of resettlement, agriculture, roads & schools construction, ponds, temples and other places for tourism. The proportion of the cleared land was used as follows:

- Agriculture, 19.98 %
- Resettlement 29.57 %
- Resettlement & Agriculture 8.90 %
- Roads 23.74 %
- School 5.85 %
- Pond 0.19 %
- Irrigation & Canal 0.71 %
- Others 12.07%

The comparison between the actual productivities against the target plan indicates that 64.22% of the productivities are over the target set in IWP 2006. This is a positive trend with a surplus of 1,209,891m<sup>2</sup> or +64.22%, compared to the target of 1,884,000m<sup>2</sup>. In addition, it should be highlighted that there was no any case of mine incident was happened in DU6 during the operations. This could be assumed that it is a very successful project.

In humanitarian demining and socio-economic technical terms, the demolition of 1,848 anti-personnel mines could be saved at least 1,848 lives and limbs, and 8,195UXO could be saved at least 40,975 lives. It could be described that the grant of USD 1,058,451 during 12-month period could save up to 42,823 people's lives and 3,093,891m<sup>2</sup> of land cleared were confirmed as safe for 13,343 families and 1,906 students, who were under the threat of landmines and UXO.

## 6. CMAC – JMAS PROJECT TO SUPPORT UXO CLEARANCE AND CBURR

### 6.1. Project Background

This project was supported by the Japanese Mine Action Service (JMAS) with an amount of USD152,089.90 to support 6 EOD teams in Prey Veng, Svay Rieng and Kandal provinces and 12 District Focal Points of Community Based UXO Risk Reduction (CBURR) for the period of one year from 12 July 2005 to 11 July 2006 in Prey Veng, Svay Rieng and Kandal provinces. This project was then renewed from 7 August 2006 to 6 August 2007 to support up to 7 EOD teams in provinces of Svay Rieng, Kandal, Kampong Speu and Kampong Cham, and 16 District Focal Points of CBURR in the provinces of Prey Veng, Svay Rieng, Kandal and Kampong Speu. The funding support for this project term, therefore, is USD 191,771.07 (USD143,507.07 for 7 EOD, and USD48,264.00 for 16 CBURR district focal points).

**12 July 2005 – 11 July 2006:**

- 2 EOD Supervisors (2 Persons)
  - 6 EOD Team (21 Persons)
  - 12 CBURR District Networks (16 Persons)
- Total = 32 persons

#### 7 August 2006 – 6 August 2007:

- 3 EOD Supervisors (3 Persons)
  - 7 EOD Team (21 Persons)
  - 16 CBURR District Networks (16 Persons)
- Total = 40 persons

The goal of this project is to bring about personal security to the communities living in UXO affected areas and to reduce the number of casualties caused by UXO, particularly in the provinces of Kandal, Kampong Speu, Prey Veng, Svay Rieng and Kampong Cham.

The project's objectives are:

- To reduce risks through the collection and destruction of the UXO to provide the target communities with safe access to resources to facilitate their socio-economic development.
- To enable development activities to be carried out in the target areas in collaboration with national and international development agencies.



## 6.2. Project Activities and Achievements

The project resources were deployed in 38 different districts in whole four different provinces: 7 districts in Svay Rieng, 12 districts in Prey Veng Province, 8 districts in Kampong Speu, and 11 districts in Kandal Province. But the new project was extended to cover in 54 different districts in five different provinces: 8 districts in Kampong Speu, 16 districts in Kampong Cham, 7 districts in Svay Rieng, 12 districts in Prey Veng Province and other 11 districts in Kandal Province. This could be confirmed that the CBURR target districts covered only 16 districts in the four different provinces of Prey Veng (Kampong Leav, Baphnom, Kampong Trabek, Preah Sdech), Svay Rieng (Svay Chrum, Kampong Ro, Svay Teap, Romdoul), Kandal (Angsnuol, Kandal Steung, Ksach Kandal, Laver Em) and Kampong Speu (Odong, Chbarmon, Phmom Srouch, Samraong Tong).

The figures of the progress below captures the 12-month period starting from July 12, 2005 to July 11, 2006 conducted by 6 EOD teams and 12 CBURR DFP under financial support from JMAS.

▪ Area cleared	=	17,944 m <sup>2</sup>
▪ Anti-personnel mines (AP) found	=	3,015
▪ Anti-tank mines (AT) found	=	47
▪ UXO found	=	26,797
<b>Total</b>	=	<b>29,859</b>
▪ Number of tasks responded	=	2,542 tasks
▪ SAA	=	358 Kg

In addition to UXO clearance, the project also carried out risk reduction education activities made by 12 CBURR DFP and CBURR networks as follows.

Targeted Province	Targeted District	Villages Visted	House visited	Number Participants			Number request by			Number Task		
				Men	Women	Child	Req	Mine	UXO	Req	Mine	UXO
Kandal	Ang Sould	221	1,478	1,270	1,550	3,643	441	-	4,559	441	-	4,559
	Kan. Stoeng	97	63	1,558	460	2,022	182	1	1,970	182	1	1,970
	Khach Kandal	132	3,574	3,263	1,459	2,390	87	14	316	61	14	289
	Lvea Aem	197	2,201	6,216	6,677	3,001	72	1	256	32	1	177
<b>Sub-total</b>		<b>647</b>	<b>7,316</b>	<b>12,307</b>	<b>10,146</b>	<b>11,056</b>	<b>782</b>	<b>16</b>	<b>7,101</b>	<b>716</b>	<b>16</b>	<b>6,995</b>
Prey Veng	Prey veng	361	1,189	1,403	1,367	1,478	95	1	423	95	1	423
	Ba Phnom	184	1,156	1,731	1,931	2,912	97	1	472	91	1	472
	Kg. Trabaek	190	2,001	2,745	2,453	3,123	120	-	244	188	-	244
	Preah Sdach	268	1,086	3,079	2,780	4,198	199	1	579	199	1	565
<b>Sub-total</b>		<b>1,003</b>	<b>5,432</b>	<b>8,958</b>	<b>8,531</b>	<b>11,711</b>	<b>511</b>	<b>3</b>	<b>1,718</b>	<b>573</b>	<b>3</b>	<b>1,704</b>
Svay Rieng	Svay Chrum	272	1,131	1,511	1,730	2,739	164	32	1,653	161	32	1,649
	Kampong Ro	204	858	703	910	1,825	244	71	1,885	235	72	1,879
	Svay Teap	257	717	1,727	1,490	3,241	156	177	950	156	177	937
	Rom Dul	269	891	2,028	1,852	3,151	161	115	1,444	153	111	1,424
<b>Sub-total</b>		<b>1,002</b>	<b>3,597</b>	<b>5,969</b>	<b>5,982</b>	<b>10,956</b>	<b>725</b>	<b>395</b>	<b>5,932</b>	<b>705</b>	<b>392</b>	<b>5,889</b>
<b>GRAND TOTAL:</b>		<b>2,652</b>	<b>16,345</b>	<b>27,234</b>	<b>24,659</b>	<b>31,923</b>	<b>2,018</b>	<b>417</b>	<b>14,751</b>	<b>1,924</b>	<b>414</b>	<b>14,588</b>

It should be noted that in the 12-month period of the reporting year, 6 EOD Teams (from January to July 2006) and 7 EOD team (from August to December 2006) worked in 38 to 54 districts in five different provinces of Kampomg Speu, Prey Veng, Svay Rieng, Kandal and Kampong Cham. They achieved the following results:

- Area cleared = 22,880 m<sup>2</sup>
- Anti-personnel mines (AP) found = 713
- Anti-tank mines (AT) found = 57
- UXO found = 31,104
- Total = 31,874**
- Number of tasks responded = 2,993 tasks
- SAA = 755 Kg

The table below shows the activities of CBURR in 16 districts of the four provinces and its achievements from January 2006 to December 2006.

Month in 2005	Visit			Number of Participants					Request send by DFP				
	Vil. Visited	Com. Visited	House Visited	Course	Men	Women	Children	TOTAL	Req.	AP	AT	UXO	TOTAL
Jan-06	272	86	1,259	190	4,065	3,775	2,106	9,946	177	16		1,642	1,658
Feb-06	253	102	1,661	194	2,268	2,081	4,786	9,135	251	30		1,983	2,013
Mar-06	243	112	1,332	202	2,141	1,982	3,558	7,681	269	34		1,986	2,020
Apr-06	178	90	1,259	153	1,793	1,707	1,884	5,384	128	31		1,078	1,109
May-06	249	108	1,676	205	2,342	2,111	3,602	8,055	185	37		1,289	1,326
Jun-06	242	126	1,792	212	2,469	2,188	4,767	9,424	215	527	0	2,222	2,749
Jul-06	254	170	1,960	244	3,063	2,688	2,861	8,612	201	37	0	2,047	2,084
Aug-06	258	142	1,925	247	2,430	2,265	2,377	7,072	175	42	0	1,884	1,926
Sep-06	249	125	1,554	243	2,900	2,250	2,524	7,674	149	49	0	1,485	1,534
Oct-06	388	136	2,303	370	3,660	3,266	3,783	10,709	208	80	0	1,800	1,880
Nov-06	246	144	1,568	246	2,805	2,495	3,445	8,745	146	25	0	1,166	1,191
Dec-06	309	127	2,161	572	3,199	2,586	4,271	10,056	236	34	0	1,948	1,982
<b>Total</b>	<b>3,141</b>	<b>1,468</b>	<b>20,450</b>	<b>3,078</b>	<b>33,135</b>	<b>29,394</b>	<b>39,964</b>	<b>102,493</b>	<b>2,340</b>	<b>942</b>	<b>0</b>	<b>20,530</b>	<b>21,472</b>

### 6.3. Socio-Economic Impact and Analysis

In the 12-month period (July 2005 to July 2006), hundreds of UXO spot occupied in 17,944 m<sup>2</sup> in the target provinces were cleared and 29,859 items of mine/UXO underground were removed. Safe land was handed over to the communities and local authorities in the purposes

for agriculture...etc. This could be assumed that at least 137,000 of people's lives could be saved from UXO accidents, and as well as the achievement of 31,874 items of mine and UXO from January to December 2006 could be saved up to 156,233 of people's lives and limbs.

In the completion report from July 2005 to July 2006, the achievement was positive if compared to the target set in IWP 2006. Whereas the achievement from January to December 2006, it also revealed a positive trend comparing to the target highlighted in IWP 2006.

## 7. CMAC- JMAS: PROJECT TO SUPPORT COMMUNITY-BASED DEMINING IN BATTAMBANG

### 7.1. Project Background

This project is joint cooperation between CMAC and JMAS with the support from the Government of Japan, starting from June 2006 to May 2007 with total cost of USD 216,466.38 to cover 3 platoons of Community Based Demining which consists of 99 field staff, working in the highly contaminated adjacent districts of Battambang Province along Cambodia-Thailand borders, i.e. Kamrieng district.

The project objectives of the project is to increase the participation of affected communities in addressing mine and UXO problem, reducing risks within their own communities and their vicinity and to empower the communities to deal with mine and UXO problem in the long run.

### 7.2. Project Activities and Achievements

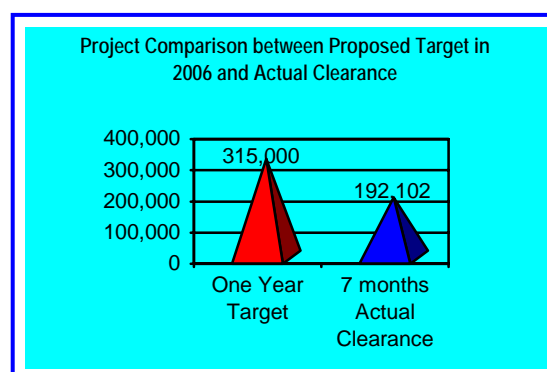
The resources of the project were mainly deployed in Kamrieng district of Battambang. The achievements of the project in this reporting period covered only seven months from June to December 2006 as indicated in table below.

Period		Progress from June to December, 2006				
		Area Cleared	AP Found	AT Found	UXO Found	Fragments
Quarter 1	June	13,190	34	6	4	29,036
	July	12,035	9	0	3	23,441
	August	20,729	52	0	5	39,332
	<i>Sub-total</i>	<i>45,954</i>	<i>95</i>	<i>6</i>	<i>12</i>	<i>91,809</i>
Quarter 2	September	21,003	86	1	6	47,295
	October	43,426	50	0	20	84,022
	November	32,110	37	0	9	71,454
	<i>Sub-total</i>	<i>96,539</i>	<i>173</i>	<i>1</i>	<i>35</i>	<i>202,771</i>
<i>December</i>		<i>49,609</i>	<i>50</i>	<i>0</i>	<i>4</i>	<i>92,336</i>
<b>GRAND TOTAL</b>		<b>192,102</b>	<b>318</b>	<b>7</b>	<b>51</b>	<b>386,916</b>

### 7.3. Socio-Economic Impact and Analysis

In the 7 month period from June to December 2006, 7 minefields or 192,102m<sup>2</sup> were cleared and handed over to the communities of 147 families for the purposes of agriculture and roads construction in their own communities.

The seven-month-productivity of clearance in this report represented 60.98% against the target of 315,000m<sup>2</sup> one year project period.



The demolition of 318 anti-personnel mines could be saved at least 318 lives and limbs, and 51 UXO could be saved at least 255 lives. In total, 573 lives were saved from the accident. In addition, some of communities' properties were avoided from the damages due to the AT mine explosion.

## 8. CMAC-DU1-AUSTCARE PROJECT: INTEGRATED MINE ACTION AND DEVELOPMENT PROJECT IN BANTEAY MEANCHHEY PROVINCE

### 8.1. Project Background

This is a joint cooperation project from March 2006 to June 2008 between CMAC and AUSTCARE designed to provide mine action and development support in the affected village in Lbeuk Svay, Chamkar Kor and Damnak Kokoh of Svay Chek commune, Svay Chek district, Banteay Meanchey Province. The total cost of this project is AUD 586,472.94 supported by the Government of Australia through AusAID and AUSTCARE.

### 8.2. Project Activities and Achievements

The resources of the project were deployed upon the requirement of AUSTCARE's development program in collaboration with local authorities by integrating demining and development program in the target areas. The Project Resources funded by AUSTCARE are outlined below.



- 1 Demining Platoon composted with 30 personnel
  - 1 Technical Survey small team composted with 5 personnel
  - 1 Community Mine Clearance composted with 9 personnel
  - 1 Community-Based Demining composted with 32 personnel in those 14 are female deminers
- Total: 76 personnel

The progress made by the project resources during the period from March to December 2006 was capture in the table below

Resources	Progress								
	Area cleared (m <sup>2</sup> )	Cutting (m <sup>2</sup> )	Excavation (m <sup>3</sup> )	Linear meters marked	AP Mine	AT Mine	UXO found	Small calibers (kgs)	Fragments
1 MP	218,011	0	0	0	206	5	73	0	279,057
1 Small TST	40,149	0	0	10,228	40	1	34	0	15,943
1 CMC	104,728	0	0	8,434	121	0	45	0	49,275
1 CBD	78,631	0	0	0	52	0	2	0	52,339
<b>Total</b>	<b>441,519</b>	<b>0</b>	<b>0</b>	<b>18,662</b>	<b>419</b>	<b>6</b>	<b>154</b>	<b>0</b>	<b>396,614</b>

### 8.3. Socio-Economic Impact and Analysis

In the 10 month period from March to December 2006, 18 minefields or 441,519m<sup>2</sup> were cleared and handed over to local communities of 163 families for the purposes of agriculture and roads construction in their own community.

The productivity of clearance in 10 –month- period represented 80.86% against the target clearance of 546,000m<sup>2</sup> in the one year period. In addition, the demolition of 419 anti-personnel mines could be saved at least 419 lives and limbs, and 154 UXO could be saved at least 770 lives. In total, 1,189 lives were saved.

## 9. CMAC-PEACE BOAT PROJECT IN THE DEMINING UNIT 4 – Preah Vihear Province

### 9.1. Project Background

Peace Boat has started collaborated with CMAC on demining and development work since 2001 in Pursat. The support given by Peace Boat to CMAC has been in the form of financial assistance toward the operations of mine clearance with subsequent financial donation for public facility building such as primary school building for children living the mine infected areas, clearance of areas surrounding school compound and health center to provide safety to pupils and population attending to these public facilities. All these projects have been bilaterally funded by Peace Boat and implemented by CMAC Demining Unit 5 based in Pursat.

The first of its activities was the funding for clearance and a construction of a primary school building in Pteah Rung village of Kravanch district in Pursat in 2001. Peace Boat also helped donated some of school materials to teachers and poor students at the newly-built premise.

The second involvement of Peace Boat with CMAC was its support for the mine clearance and building of surrounding fence and gate for a primary school in Stung Thmey village of Veal Veng district in 2002.

The third project involved the clearance of area surrounding a health center and an enforcement of proper fence surrounding the center of Chamkar Chrey Khan Cheung village, Anlong Reab commune, Veal Veng district, Pursat province in 2003.

The fourth project is subjected to mine/UXO clearance and school construction in Koh Ker Village, Srayong Commune, Kulen District, Preah Vihear Province.

The fifth and sixth projects which focuses on mine and UXO clearance and school & Road construction in Osampor II Village, Osampor Commune, Malay District, Banteay Meanchey Province, and is the large project costing USD118,214.63.



Mine and UXO clearance, school & road construction in Osampor II Village, Osampor Commune, Malay District, Banteay Meanchey Province from 02 September 2005 – 20 April 2006

## 9.1. Project Activities and Achievements

- 9.1.1.** At the end of 2005, Peace Boat supported a project which was implemented by Deminig Unit 1 based in Banteay Meanchey Province. The total project cost is USD111,623.63, including mine/UXO clearance operations and two concrete schools construction with 10 rooms and two large ponds.

The first stage in relation to mine clearance operations, of course, started from September and finished in November 2005. With resources of one mobile platoon and two Mechanical Clearance Machines (Brush Cutters), the contaminated land of 54,641 m<sup>2</sup> was cleared and released for school construction. Further, 65 anti personnel mine and 26 UXO were found and destroyed in place. Two villages consist of 830 families and 585 students must be beneficiaries of this project.

In the second stage, the school constructions has been starting after the completion of mine clearance operations, and completed on 18 March 2006, and the opening ceremony was held in April 2006.

- 9.1.2.** For this report, it is the seventh project focusing on mine and UXO clearance in Koh Ker Village, Srayong Commune, Kulen District, Preah Vihear Province, which costs USD 34,981.45 starting from September to December 2006.

The goal of this project is to bring about personal security to children, families, and communities living in mines affected area in Koh Ker village, Srayong Commune, Kulen Districts, Preah Vihear province in order to enable them to safely access to their schools, and freely communicate between the village of Koh Ker and Kompich. One mobile platoon of the project resource made a satisfactory outcome of 196,168m<sup>2</sup> in term of clearance, and destroyed 7 anti personnel mines and 14 UXO. This outcome benefited to 232 families as direct beneficiaries and 696 children, and 760 families of vulnerable people as the indirect beneficiaries, who are threatened by landmines and in archeological site of Koh Ker.

## 10. CMAC – UNICEF: MINE RISK EDUCATION AND REDUCTION (MRE), CBMRR AND MASS MEDIA CAMPAIGN PROJECTS

The project has been jointly implemented by CMAC and UNICEF. In 2006, UNICEF agreed to provide financial support of USD 117,761 to cover the costs of mine awareness materials and mass media campaign as well as CBMRR networks and MRE teams in Battambang, Pursat, Pailin, and Oddar Meanchey province.

The productivity made by the project resources from January to December 2006 as follow:

- |  |                        |
|--|------------------------|
| ▪ Clearance                                | : 13,655m <sup>2</sup> |
| ▪ Anti personnel mines found and Destroyed | : 210                  |
| ▪ Anti tank mines found and Destroyed      | : 2                    |
| ▪ UXO found and destroyed                  | : 1,532                |
| ▪ Small calibers found and destroyed       | : 4 Kg                 |



## CONTRACTUAL SERVICES

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### Article 29:

CMAC may charge for products or services provided to corporations other institutions or private individuals on a cost recovery basis. The charges shall not exceed the service cost.

According to the article 29 of the Royal Decree, No. NS/RKT/0810/264, dated 07 August 2001, on the establishment of the Cambodian Mine Action Centre (CMAC), CMAC is able to engage contractual services with other business or private sector to sustain its operations activities. In 2006, CMAC engaged a small scale of contractual services with three private sectors in term of providing mine and UXO clearance activities to the companies.

#### 1. **Contractual Services with Sea Union Construction Company:**

This private company was contracted with CMAC for one week period from 01 to 05 April 2006 to clear UXO contaminated land in CPC village in Sangkat Tekthla, Khan Russei Keo, Phnom Penh. The project was to clear 6,000m<sup>2</sup> to build the warehouse for the company. The cost charged from this company was USD1,980 to support 5 staff of CMC team and 5 staff of MDD team with 2 detection dogs to complete this agreement.

#### 2. **Contractual Services with the Cambodian Airport Management Service:**

This project was contracted for 2 different sites of UXO survey and spot check in the Phnom Penh airport for short term period of 14-day in May and June 2006 between CMAC and THE CAMBODIAN AIRPORT MANAGEMENT SERVICE. This project was to clear 9,845m<sup>2</sup> in the Phnom Penh airport in order to enlarge the runway of aircraft. The cost charged from the company was USD 3,400 to support one team of CMC as stated in the agreement.

#### 3. **Contractual Services with the Liberty Mining International Pty Ltd:**

This project was contracted for 2 different sites of UXO survey and spot check in Rattanakiri province during November 2006 between CMAC and the Liberty Mining International Pty Ltd. The project was to clear 59,600m<sup>2</sup> in purpose of researching mine underground for the company. The cost charged from this company was USD 24,600 to support one CMC (9 staff), 1 EOD (3 staff) and 1 Brush Cutter (2 staff) as stated in the agreement.

## KEY CHALLENGES

Demining is a challenging job. It is both dangerous and difficult. In addition, in CMAC's context, the heavy reliance on external funding is of particular concerns for both CMAC management and deminers.

In its operations, CMAC faces a number of key challenges which require constant attention. Those key challenges are:

1. Heavy dependence on donors: CMAC is heavily dependent on the donor support which sometimes poses one of the major risks for its activities. Currently, approximately 95% of CMAC's activities and resources are supported by several different donors and development partners. Technically, each donor has their own agenda and platform, which sometimes have a critical impact on CMAC.

2. Demining is dangerous in nature: It is generally accepted that demining work is one of the most dangerous tasks; therefore deminers are required to highly concentrate and strictly follow the standard operations procedures (SOPs) as a safety guideline and standard for their work. At the same time the organization has to keep the level of morale and disciplines to a high standard to ensure that the work practices are attainable in the safest environment for its staff.



3. Road infrastructure: Cambodia has one of the worst access roads in the rural areas. As demining is often conducted in the areas where people have not been, access roads often pose great challenges. CMAC uses all means and plan very carefully to ensure that demining can be conducted in an efficient and safe way.



4. Environmental Factors: This is one of the biggest impacts associated with demining activities. Experience shows that environmental factors, including terrains, weather conditions and density of vegetation can slow down demining work considerably.

5. Anti-tank mine stacks: due to the nature of chronic internal conflicts, a variety of techniques were employed in laying mines against opponents. During that time, only one thing was in mind: to stop the opponents from advancing, at all costs. Stacks of 2 to 6 anti-tank mines have been

found. These pose formidable challenges for the development and application of mechanical demining systems.





## HOW CAN TECHNOLOGY HELP DEMINING OPERATIONS?

### 1. Background

Demining is both dangerous and painstaking. It is dangerous because it involves risks and requires undivided concentration. It is painstaking because it heavily involves vegetation removal prior to detection and excavation. Ask any experience demining



operator, and you will get the same answer: it is a painstaking job to remove the vegetation, especially in a tropical country like Cambodia. Experience shows that manual vegetation removal takes up to 60 to 70% of the demining time. Some minefields are just not possible to clear by hand.

What is the solution for demining operator to deal with this? How can demining be faster?

Nearly ten years ago, CMAC put these questions on the table and thought and fought hard for the answers. Finally, through the cooperation with Japanese manufacturers and with assistance from the Japanese Government, CMAC found a solution. After comprehensive tests, trials and improvements in 1999 and subsequent years, CMAC found



that the mechanical system proved to be very effective in dealing with heavy vegetation. As a result of the tests and trials, the first Brush Cutters (BC) were donated by the Government of Japan and introduced in CMAC operations in 2000.



In 2000, CMAC had 4 Brush Cutters: 2 Hitachi Ex-150 and 2 Komat'su PC-60. After the operator and maintenance training at the TC, they were deployed to assist demining in Demining Unit 1 in Banteay Meanchey province and Demining Unit 2 in Battambang province. In 2003, CMAC received 8 more Hitachi ZX-160 brush cutters and in 2005, 15 new

Hitachi ZX-160 brush cutters were delivered to CMAC under the grant aid scheme, making a total of 27 BC's deployed in the minefield in all demining units.



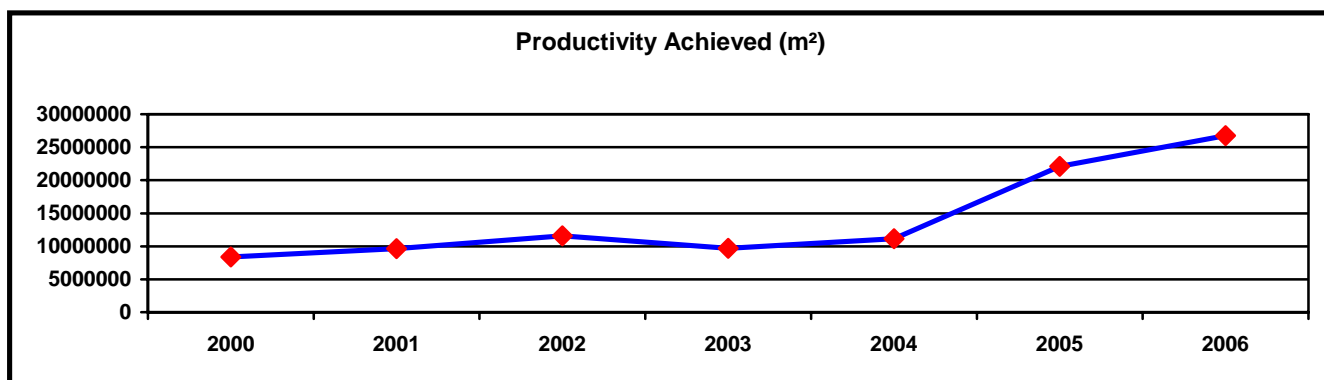
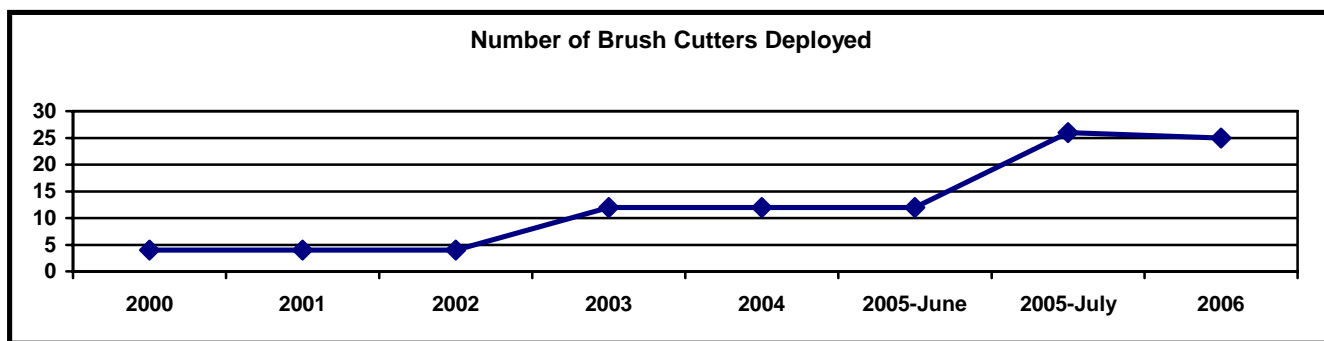
Resource Mobilization	January –December 2006											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BC DU1	6	6	6	6	6	6	6	5	4	6	6	6
BC DU2	12	12	12	12	12	12	12	12	12	12	12	12
BC DU3	4	4	4	4	4	4	4	4	4	4	4	4
BC DU4	3	3	3	3	3	3	3	3	3	3	3	3
BC DU6	2	2	2	2	2	2	2	2	2	2	2	2
BC R&D SR								1	2			
TOTAL :	27	27	27	27	27	27	27	27	27	27	27	27

\* **Remark:** Two Komatsu brush cutters were removed from demining operations.

Today, the application of the brush cutters has gone a long way. Brush cutters were originally designed to cut and remove vegetation (non-ground engaging) in the mine fields to support other demining components such as manual demining teams, platoons, and MDD teams. Since the introduction into operations the brush cutters have enormously helped speed up the demining process and have changed the way demining is conducted in Cambodia. With the use of these machines, together with sound field management and training, CMAC was able to double its productivity in 2005 and continued to deliver a very high productivity in 2006.

In 2005, CMAC took an initiative to trial this system to function as a stand-alone landmine clearance (ground engaging) system in addition to the sole vegetation clearing function. The trial was successful and the system has proved to be a very effective and useful landmine clearance system. As a result of the trial, CMAC reviewed the SOP and started to use the brush cutters for both vegetation cutting and ground engaging activities. To make them even more effective and efficient, a team of 4 deminers are attached to each brush cutter.

It should be noted that since the introduction of the brush cutters, the demining productive sharply increased from around 10 km<sup>2</sup> per year to over 26 km<sup>2</sup> per year in 2006.



## 2. Applications of the Brush Cutters

### 2.1 Vegetation Removal Role

From 2000 to 2004, the brush cutters were used solely as a mechanical vegetation removal tool to cut and remove vegetation, grapple tree trunks and excavate soil mounts in the minefields to support other demining teams such as manual demining teams, MDD teams and mobile intervention teams to improve the demining capacity. This function of the brush cutters is also a primary application today.

In this application mode, the tool is used primarily to remove vegetation prior to detection and excavation by deminers, thus reducing the manual demining work time by 60 to 70%. The cutting capacity of the brush cutters in the minefields is within in the following range, depending on the density of the vegetation:

- Light bush: 280 – 300m<sup>2</sup>/h
- Medium bush: 240 – 260m<sup>2</sup>/h
- Heavy bush: 220 – 240m<sup>2</sup>/h
- Excavation of berms: 30 – 32m<sup>3</sup>/h

In 2001, CMAC trialed integration of the brush cutters with mine detection dog teams. After completion of the trial, the brush cutters were found to be a very useful system for integration with the MDD teams assisting them by cutting and removing the vegetation in the minefields prior to deployment of the dogs. Integration of brush cutters with other demining toolboxes has become an integral concept of applying brush cutters to assist demining operations, and the integration concept has produced satisfactory results by doubling the productivity in the fields. However, integration of these tools requires sound management skills and experience.

### 2.2 Mine Clearance Role

Realizing the great capability and potential in demining operations, in 2005 CMAC conducted a trial to use the brush cutters in the ground penetration mode to dig into the ground and destroy or neutralize anti-personnel landmines. The purpose of the trial was to find a way to use the brush cutters as a stand-alone mine clearance tool to speed up demining operations to an even greater extent, by combining the vegetation cutting and mine clearance operations in one system. The trial was successfully completed, and the brush cutters proved very capable and useful in the mine clearance operations. To adopt this function in operations, the brush cutter teams were restructured in April 2005 and 4 deminers were attached to each brush cutter as a result. CMAC also reviewed the



standard operations procedures (SOP's) for the brush cutters to reflect the real operations on the ground.

Following many years of experience in field operations, CMAC has unlocked many applications and potentials of the brush cutters to serve the main purpose – making demining safer and faster. Today, in addition to deploying the brush cutters in the routine vegetation cutting and mine clearance operations, the brush cutters are deployed in complicated minefields such as those contaminated with sensitive or anti-prodding anti-personnel mines, minefields with heavy fragment contamination, minefields with hard ground conditions, or contaminated soil berms as a result of previous military or development activities. These conditions of minefields are very difficult and pose great risks for manual deminers.



In addition, the brush cutters are also used to excavate soil mounts and to assist EOD teams to dig for buried UXO. Based on operational performance, the average excavation productivity of a brush cutter is 150 m<sup>2</sup> per hour. Even though it is lower than the cutting productivity, it is safer for deminers to clear the areas after the ground has been excavated.

**2.3 Soil Sifter Role:**

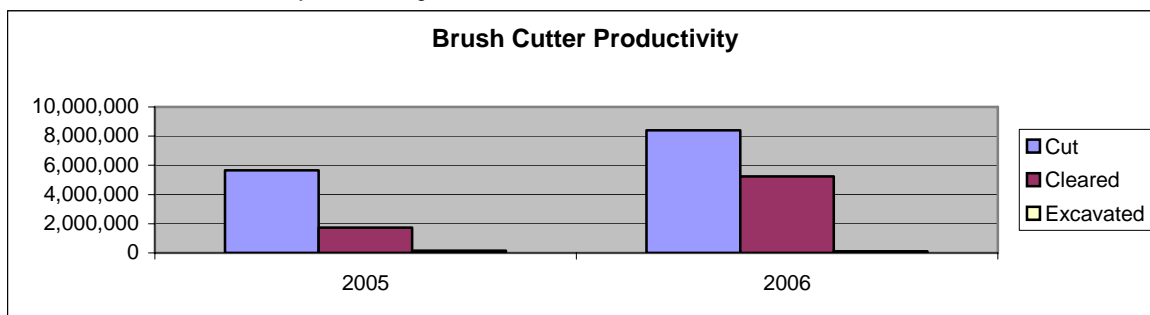
In mid-2006, responding to CMAC request, CMAC received 4 multi-tool sifters from US Night Vision (NVESD) to attach to the brush cutters with a quick connector for a trail purpose. Changing from the current rotary cutter to one of the 4 types of the multi-tool sifters only takes about 5 minutes. The trial of the sifters aims to assist mine clearance by excavating and draining soil in hard terrain.



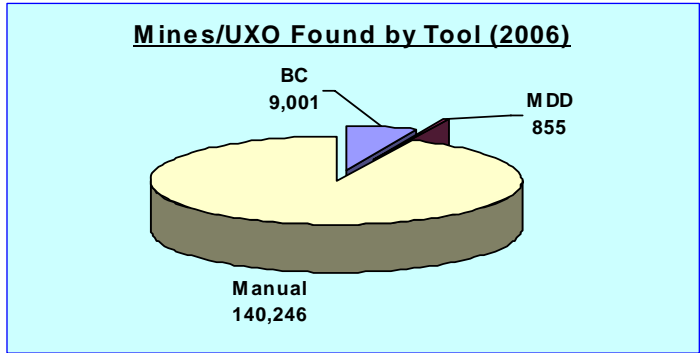
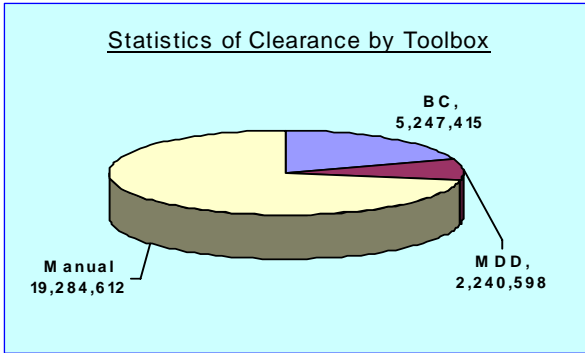
The trial is still on-going today, but preliminary results show that the sifters are useful for specific conditions of minefields and should well supplement to the existing rotary cutters.

**3. Productivity**

The following charts show the productivity of the brush cutters in the cutting, mine clearance and excavation roles in the past two years, 2005 and 2006.







#### 4. Obstacle Handling

One of the most remarkable features of the brush cutters is their self-recovery capability when they are stuck in the soft ground. In a tropical country like Cambodia, soft ground during the wet season poses a great challenge for heavy mechanical systems. That is probably the reason why not many demining operators are ready to go with the heavy machinery in mine clearance.

CMAC has a long experience with the brush cutters, and operators' skills and the machine recovery capability using their long arm are very useful when they are deployed in the wet season. This self-recover capability is a unique feature of the brush cutters, and that explains why the brush cutters are fully operational all year round and they have access to all conditions of the minefields, especially where other types of demining machines cannot be deployed.



#### 5. Supporting Development

In addition to their primary functions in mine clearance, vegetation cutting and removal, and excavation and clearance of berms, brush cutters are



also used to support development activities such as access road construction, digging ponds and water canals, etc. This is a very useful function, and it is especially very much needed by the communities which are in bad needs for road and water sources.



CMAC's brush cutters have made countless contributions to the community development efforts through paving and building access roads, digging water ponds for families and communities, digging water canals for irrigation in the communities. These development activities in the former minefields have improved livelihoods of thousands of families and have created a close bond between CMAC and the communities.

## 6. Maintenance

The brush cutters are not only useful in operations, but also simple to maintain, compared with other demining equipment used worldwide. Since they are excavator-based, maintenance of these machines is not so complicated. CMAC has an in-house maintenance capacity, and the main maintenance and repair facilities are located within CMAC's Central Workshop in Battambang.

In this Workshop, CMAC's experienced mechanics can perform all maintenance and repair tasks, from regular services to major repairs. Japanese experts from the manufacturers also provide technical support from time to time to ensure the optimum operational quality of the machines.

## 7. Conclusion

Ask a deminer or an operator, and they will come up with the same answer: these brush cutters are very good.

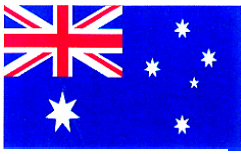


CMAC and the Manufacturer have come this far without great efforts and undivided commitment to make the systems work in Cambodia. A series of tests, trials and improvements have been made before they can deliver the performance the way they do today. Without a good management, sound field experience, strong commitment and technical support, the systems would not be of the same quality as they are today.

Finally, without the generous assistance from the Japanese Government through the ODA Grant Aid Scheme, CMAC's deminers would still be using traditional manual cutting tools to remove the heavy vegetation. Demining would still be dead slow.

Who benefits from this technology? The answer is all, especially the Cambodian people who really need safe land for their livelihood.

## SPECIAL THANKS TO CMAC DONORS AND DEVELOPMENT PARTNERS



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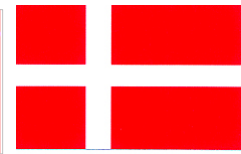
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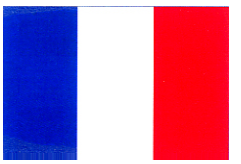
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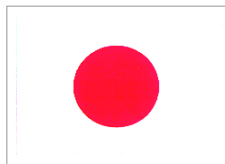
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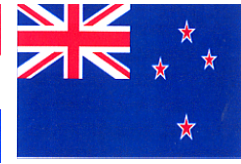
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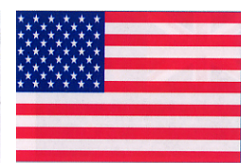
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