

Joint Evaluation of Mine Action in Cambodia
for the
Donor Working Group on Mine Action

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List of Abbreviations

ADB	Asian Development Bank
AR	Area Reduction
CAP	Contracts, Assets and Procurement Committee
CBA	Cost benefit analysis
CBMRR	Community Based Mine Risk Reduction
CIDA	Canadian International Development Agency
CMAA	Cambodian Mine Action and Victims Assistance Authority
CMAC	Cambodian Mine Action Centre
CMVIS	Cambodia Mine Victims Information System
DAC	Disability Action Council
DFID	Department for International Development (U.K.)
DLM	Department of Land Management
EOD	Explosive Ordnance Disposal
GIS	Geographical Information System
HIB	Handicap International Belgium
IAPSO	Inter-Agency Procurement and Supply Organization
ICE	Information, Communication, Education
JICA	Japan International Cooperation Agency
JMAS	Japan Mine Action Service
L1S	Level One Survey
LUPU	Land Use Planning Unit (now MAPU)
LWF	Lutheran World Federation
MAG	Mines Advisory Group
MAPU	Mine Action Planning Unit
MCA	Multi-Criteria Analysis
MLM	Ministry of Land Management
MRE	Mine Risk Education
NGO	Non-government Organization
NPA	Norwegian People's Aid
NPV	Net Present Value
OMOL	One Man One Lane
PLG	Partnership for Local Government
PLM	Provincial Department of Land Management
PMAC	Provincial Mine Action Committee
RCAF	Royal Cambodian Armed Forces
RGC	Royal Cambodian Government
SIDA	Swedish International Development Agency
TWG	Technical Working Group
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNMAS	United Nations Mine Action Service
UNOPS	United Nations Office of Project Services
UXO	Unexploded Ordnance

Executive Summary

Purpose. This report presents the findings and recommendations of the Joint Evaluation of the Mine Action Sector in Cambodia to the Royal Cambodian Government (RGC) and the donor Technical Working Group on Mine Action (TWG). The objectives of the joint evaluation are to:

- a. Provide an independent assessment of the achievements and challenges of the mine action sector in Cambodia;
- b. Present strategic recommendations for the orientation of future donor support to the sector, taking into account the need to strengthen the linkages between the mine action sector and national development plans and programmes; and
- c. Provide a common basis for a renewed donor-government partnership in the mine action sector with improved national leadership and ownership.

Background on Mine Action in Cambodia. The contamination of land mines and unexploded ordnance (UXO) in Cambodia is not only severe, but also highly complex. The K-5 mine belt, a swath of densely laid mines 700 kilometers long and 400-500 meters wide along the northwestern border of the country, is vast and densely contaminated, but it is also rather well defined. In other parts of the war zone, mines were laid, year after year, to establish defensive perimeters as combatants retreated to safe ground after an annual dry season offensive to wait out the rains. These sporadic and over-lapping mine fields are unmapped and follow no regular patterns.

The rule of thumb for UXO contamination is 10% of all expended ordnance. US bombing data report over 500,000 tons of bombs dropped on Cambodia, much of it fortunately in lightly inhabited northeastern provinces. Applying the rule of thumb, there are potentially 50,000 tons of unexploded bombs in the countryside, plus additional unexploded artillery shells, grenades, and mortar rounds expended by other combatants.

A survey carried out in 2002 concluded that 46% all Cambodian villages have some kind of contamination. Due to limitations on the methodology employed, the survey also reached the controversial conclusion that suspected contaminated area in Cambodia totaled 4,500 square kilometers. If this figure is taken at face value, the mine action problem will last for decades.

Major Findings and Recommendations.

1. The Scope of the Problem. The consultants observed that mine clearance has been regarded as a legal problem from the standpoint of the Ottawa Convention or a geographically impressionistic one from the point of view of the Level One Survey (L1S). Both perspectives maximize the time needed to eliminate the problem. The consultants tested a triage approach. Starting from the L1S total suspected hazardous area of 4300 square kilometers, the following areas are subtracted: land of little or no productive value, land already cleared, and land in

- use. The result is around 460 square kilometers which could probably be reduced even more if land mapping data are updated. The clearance of this area could probably be completed in 10-15 years, a much more attractive time frame from the perspective of current and potential donors.
2. Funding Mechanisms. The team found that the funding methods now in use by donors to finance mine action do not, in general, promote efficiency or accountability. The team recommends a new funding mechanism, a demining trust fund, that would provide funding to qualified demining operators on the basis of competitive bidding. This contracting process would include strong technical supervision and financial monitoring components. Finally, to support de-centralized planning and priority setting at the provincial level, the trust fund resources would be dedicated to meeting provincial priorities as determined by Provincial Mine Action Committees.
 3. CMAA. The CMAA is weak and ineffective. Donors and demining operators lack confidence in the Secretariat's leadership and, as a result, CMAA's work is largely ignored. As designed CMAA has too many responsibilities, some of which overlap with other agencies. The team recommends that CMAA concentrate on a few activities: policy-making, resource mobilization, preparation of annual reports, and establishing standards, for example. At the same time, other more appropriate agencies should be directly tasked to carry out activities that have a mine action aspect, but are more appropriately theirs. These activities include mapping, land policy, land allocation and land titling (Ministry of Land Management); mine risk education (Ministry of Public Health); and victims' assistance (Disability Action Council).
 4. Mine Action Planning Units. The MAPUs directly support the Government's de-centralization policy and the provincial authorities capacities to plan and prioritize mine clearance in a transparent manner. The team fully supports the MAPU concept and the efforts of provincial governments and their development partners to strengthen the implementation of these processes. The demining fund (see No. 2 above) will also serve to strengthen provincial decision-making.
 5. The Army and the Police. Most far-sighted observers see the army and the police as having the residual role in mine clearance and explosive ordnance disposal (EOD) in the long term. However, the team discovered questions regarding the army's current capacity to carry out mine clearance in accordance with national standards. The police have so far had no formal role in mine action. Three recommendations are made for the army and one for the police. The army may make its personnel available as contract labor for qualified commercial demining operators and thereby learn by doing; the army could organize de-mobilized soldiers for employment by qualified demining operators; or the army could request international technical assistance to develop its capacities. The police should develop a long-term national capacity for EOD.

6. Government-Donor Partnership for Mine Action. Why should the Government-donor partnership on mine action be renewed? Should donors continue to fund mine action? There are several reasons why the answer to both of these questions is “yes”.

- a. There is light at the end of the tunnel.
 - Though the mine and UXO problems will indeed last a long time in Cambodia, a large part of the problem, the part that actually affects people’s lives, can be resolved in a reasonable period of time, i.e., 10-15 years if fully funded and well managed.
 - Unlike other development problems, such as HIV/AIDS, the clearance of an area ends the problem. It doesn’t come back again.

- b. Mine clearance is essential for development and poverty reduction.
 - Population growth and internal migration will continue to bring people into contact with land mines.
 - Mine action is an investment, not a cost. Mine action creates economic opportunity and reduces health and safety costs.
 - In many areas in the country, development activity, such as, school construction, wells for drinking water, and rural roads is impossible without mine clearance.
 - Demining is a poverty reduction programme. Land mine contamination directly affects the rural poor: they suffer the casualties and they are deprived of the use of land.

- c. The work can be done more efficiently.
 - Improved funding and prioritization mechanisms should focus the management of mine clearance operations on clearly defined results.
 - New mine clearance techniques and approaches can increase productivity. More land can be cleared for each dollar spent.

1. Introduction

Purpose. The purpose of this report is to present the findings and recommendations of the joint evaluation of the mine action sector in Cambodia to the Royal Cambodian Government (RGC) and the donor Technical Working Group on Mine Action (TWG).

Objectives of the Joint Evaluation. The objectives of the joint evaluation are to:

- Provide a joint and independent assessment of the achievements and challenges of the mine action sector in Cambodia, building on lessons learnt from recent individual donor evaluations and audit exercises;
- Present strategic recommendations for the orientation of future donor support to the sector, taking into account longer-term sustainability issues, national capacity development and the need to strengthen the linkages between the mine action sector and national development plans and programmes;
- Provide a common basis for a revived donor-government dialogue and partnership in the mine action sector, with improved national leadership and ownership.

The evaluation team was also requested to prepare a mapping of the mine action activities currently being carried out in Cambodia. This inventory is presented in Annex 1.1.

Methodology. The evaluation has been carried out during November 2004 by a two-person consultant team at the request of the TWG. UNDP has managed the exercise.

The evaluation team's methodology has included:

- desk review and analysis of the wide range of existing evaluation reports, project reports and studies produced by national and international mine action stakeholders (see Annex 1.2, List of Documents).
- interviews with key stakeholders in Phnom Penh, including CMAA, CMAC, RCAF, Disability Action Council, mine action operators, TWG members, and concerned non-government organizations (see Annex 1.3, List of Persons Interviewed).
- a visit to Siem Reap province to meet with Halo Trust and CMAC Demining Unit #6.
- a group meeting with Australian Volunteers posted at four provincial Mine Action Planning Units (MAPUs).

The Team will present its initial findings and main recommendations to Mine Action TWG and Council of Ministers in the fifth week of its mission and finalize its report in the first week of December 2004.

Background on Mine Action in Cambodia. The contamination of land mines and unexploded ordnance (UXO) in Cambodia is not only severe, but also highly complex. The K-5 mine belt, a swath of densely laid mines 700 kilometers long and 400-500 meters wide along the northwestern border of the country, is vast and densely contaminated, but it is also rather well defined. In other parts of the war zone, mines were laid, year after year, to establish defensive perimeters as combatants retreated to safe ground after an annual dry season offensive to wait out the rains. These sporadic and over-lapping mine fields are unmapped and follow no regular patterns.

The rule of thumb for UXO contamination is 10% of all expended ordnance. US bombing data report over 500,000 tons of bombs dropped on Cambodia, much of it fortunately in lightly inhabited northeastern provinces. Applying the rule of thumb, there are potentially 50,000 tons of unexploded bombs in the countryside, plus additional unexploded artillery shells, grenades, and mortar rounds expended by other combatants.

A survey carried out in 2002 concluded that 46% all Cambodian villages have some kind of contamination. Due to limitations on the methodology employed, the survey also reached the controversial conclusion that suspected contaminated area in Cambodia totaled 4,500 square kilometers. If this figure is taken at face value, the mine action problem will last for decades.

In regard to casualties, the CMVIS information system reported that mines and UXO caused 115 deaths and 652 injuries people in 2003. In recent months, the proportion of UXO injuries has been rising. This increase is attributed to the high price of scrap metal that encourages scavenging for metal fragments and UXO.

The international community began to support demining during the UNTAC era in 1992 and has continued to provide relatively large support since then. CMAA reports that from 1992-2003, 25,000 hectares of land was cleared of mines. In 2003, the three large civilian demining operators cleared a total of approximately 1600 hectares. A rough estimate of international contributions for mine action in Cambodia for 2004 is \$30 million when both cash and in-kind contributions are taken into account. It is not surprising that, after years of contributions, the both the Government and the donor community are frustrated with the high costs of mine action and apparently slow progress towards reducing contamination.

It is towards the resolution of these daunting problems that the joint evaluation seeks to provide some fresh insights.

2. Scoping the Problem

Key issue:

- There is no country-wide quantitative analysis of the landmine and UXO problem.

Description

With the exception of the landmine impact survey (LIS)¹ carried out in Cambodia between 2000 and 2002, there is little literature that attempts to scope the problem in Cambodia in any quantitative sense². The LIS provides spatial data on the extent of contamination, but it (and indeed all other LIS conducted in other countries) relies for its main data source on interviews carried out at the community level using participatory rural appraisal (PRA) and rapid rural appraisal (RRA) techniques. Whilst PRA/RRA are accepted methods for understanding livelihood issues (and so helpful for measuring the ‘impact’ of mine/UXO contamination) they are less accurate as means for measuring the boundaries of the extent of that contamination. There is therefore an inbuilt error into the LIS methodology (survey designers considered at the time that the geographic information they would be gathering could be accurate within +/-250m).

The situation is exacerbated in areas where there are no communities to interview, and contamination in such areas may go unreported. This may appear irrelevant in considering the impact on today’s population, but it implies increasing error as time passes; this is particularly relevant given the current progress rates predicted for mine clearance in Cambodia.

Even given the limitations, the existing survey data, especially when combined with the historical records of US bombing missions between 1969 and 1973, do provide a rough estimate of the extent of the contamination. However, it should be understood that the figures generated by the LIS probably represent one end of a spectrum of probability and it may be that the actual contaminated area is considerably smaller. There is also considerable data available from other mapping sources on relevant issues such as land use (produced by the Japanese International Cooperation Agency (JICA)) and poverty (produced by the World Food Program (WFP)).

Furthermore, the dominant paradigm in the humanitarian mine action sector is based on the requirements of Article 5 of the 1997 Ottawa Convention, which requires that all States Party must clear all of the mine contamination within 10 years of ratification of the

¹ The survey team made a decision to use the older term “Level 1 Survey” as this was name of existing survey practices in Cambodia (in both Khmer and English). at the time the survey was designed. However, it was based on LIS methodologies and its design – and conduct - was approved by certifying bodies. The newer term is used in the remainder of this report for ease of reference.

² The CMAA Five-Year Plan does include an estimate of the area that might need to be cleared, but it is an admitted guess based on an estimate of 10% of the LIS area.

convention³. Whilst the Ottawa Convention does allow for States Party to seek extension of the deadline, it specifically does *not* allow for states to leave uncleared areas that are of little or no economic benefit.

Nevertheless, in spite of the requirements of the Ottawa Convention and concerted resource mobilisation for several years, Cambodia continues to be highly contaminated whilst several donors have expressed their unwillingness to fund what appears to be an unending effort.

It is however the belief of the Team – and it is a belief that has been reflected unanimously in interviews with donors – that the evaluation of the mine action sector would be greatly facilitated by an attempt to scope the problem of landmine and UXO contamination in Cambodia. Such an analysis is presented below.

Analysis

The following analysis is based on a number of assumptions:

- That the existing LIS and other data provides the maximum probable spatial extent of contamination
- That it is possible to reduce the area to be cleared through elimination of land of little or no economic value (such as rock outcrops or swamp) and to reduce the area by removing that area that has already been cleared
- That it is also possible to reduce the area by eliminating the areas that are already in use and that are presenting no problem to existing communities

As a result of these assumptions, it may be possible to greatly reduce the extent of the problem far below that suggested by the highest estimates of the LIS. This exercise is carried out in Annex 2.1.

Results

The detail of calculations of cost, of benefit and the further establishment of the analytical framework are set out in Annexes 2.2, 2.3 and 2.4 respectively. The main points are set out below.

- The first and most obvious point is that there is a strong economic case for not clearing all of the potentially contaminated areas. For example, the cost of clearing contaminated forest exceeds its economic benefit. Reducing the total amount of area to be cleared would have significant effect.

³ Full text of the Convention is available at www.icbl.org

- If the main problem area is indeed potential agricultural area but which is currently abandoned, then existing data suggests that this is a problem that could be dealt with in around 21 years, with some incremental changes in techniques and prices that would allow a clearance rate of 20-22km² per year at a average cost of \$0.63-\$0.65 per square metre.
- However, it may be possible to further reduce these figures, through the following modalities:
 - Firstly, increasing dynamic efficiency over the life of the program should act to drive costs down and clearance rates up (this is addressed in more detail in the chapters on techniques and funding)
 - Secondly, the mapping data available for this analysis is several years old: new land use maps would doubtless show that there is less abandoned farmland today than there was when the JICA land cover maps were generated. It is estimated that the combination of re-mapping plus introduction of efficiency measures could reduce the time needed to clear abandoned agricultural land to around 10-15 years.
 - Thirdly, it could be appropriate to focus attention on areas where communities are more vulnerable (as a result of poverty) to the impact of mine contamination. It may therefore be appropriate to focus resources on the communities with the highest poverty problem. This issue is covered more in the chapter on ‘approaches.’

More detailed analysis is included in Annex 2.4

Note: This scoping exercise does not address the other mine action interventions, including explosive ordnance disposal (EOD), Mine Risk Education, or Victim Assistance. These are discussed below.

Explosive Ordnance Disposal (EOD)

EOD teams are small, mobile teams that react to reports of unexploded ordnance (UXO) being found by the population. They do not search areas of land and so cannot be said to generate the same product – cleared land – as mine clearance. They do however act to reduce the hazard from UXO and can therefore be said to generate humanitarian benefits in terms of reduced incident rates.

For the purposes of this evaluation, the benefits of EOD intervention are not assessed in any detail, due to the limited time available and the fact that, at present at least, EOD activities still represent a comparatively small proportion of the budgets of mine action

implementing agencies. It is assumed that, in principle, EOD intervention to deal with items of UXO is worthwhile.

It would however be possible to use other indicators for assessing whether the appropriate numbers of EOD teams are being provided by using response time analysis; this is set out in Annex 2.5.

There is also increasing data available about the phenomenon of deliberate tampering with live ordnance. It suggests that such deliberate risk taking behaviour can be regarded as an indicator of vulnerability (i.e. it is an act carried out due to economic necessity). This may become a criterion for allocation of EOD resources⁴.

Mine Risk Education (MRE)

Mine Risk Education is, in essence, an educational process intended to reduce the number of landmine/UXO casualties through the modification of behaviour. As a public health intervention it appears to offer the potential of a simple and cost-effective means to reduce the number of mine and UXO casualties. However, in the available literature and in interviews the Team was unable to find *any* quantifiable justification for MRE activities. Even the 2000 UNICEF evaluation was unable to provide any quantitative evidence of the efficacy of MRE interventions.

This is not to say that MRE does not have a value; it is certainly a means to generate reports of the presence of mines and UXO, and can therefore certainly assist mine action implementing agencies gather data on the location and impact of contamination. What it does tell us is that, even after several years of MRE implementation, the mine action community has little idea about the impact of MRE interventions in any quantitative sense.

It would be premature to call for an end to MRE activity. However, it would better inform the debate if more analysis was carried out on this issue. For example, a Knowledge, Attitudes and Practices (KAP) survey could be carried out to assess the actual effect of MRE interventions. Such a survey is clearly outside the scope and resources of this Evaluation but the Team recommend that one is carried out as soon as possible. UNICEF have already indicated their willingness to facilitate a KAP survey for this purpose.

⁴ Presentation by Richard Moyes, author of "Tampering: deliberate handling and use of live ordnance in Cambodia" 2 December 2004.

Mine/UXO Victim Assistance

The final major mine action intervention to be considered here is that of mine/UXO victim assistance. In Cambodia today, disabilities have numerous causes. Whilst the numbers of mine/UXO victims is a humanitarian tragedy, and may be regarded as a valid reason for donors to engage in the sector, there is a fundamental contradiction between the idea of using the *cause* of injury as a means of prioritising treatment, compared to a conventional approach by which the *severity* of injury is used to assess priorities.

At present, the needs of the disabled are addressed almost entirely by a large number of non-governmental organizations. It may be more appropriate for donors to consider the impact of mine and UXO victims on the weak public health and social welfare services and provide resources to redress this balance. Unfortunately, while there is now excellent data on the number of mine and UXO casualties in Cambodia, there is very little grasp of how these numbers relate to the overall disability problem in Cambodia as a whole. This suggests a need to conduct a survey to identify the overall problem in Cambodia which would help put the impact of mine and UXO casualties into context.

In short, the Team believes that the provision of disability assistance should be made in terms of general support to the problem of disability in Cambodia – a valid need – without trying to link this support to mine victims. This is consistent with the approach advocated by the Cambodian Disability Action Council which would appear to provide a suitable means to coordinate such activities. It is therefore not considered further in this Evaluation.

Recommendations

- Review of the status of Article 5 of the Ottawa Convention, in recognition that not all land will be cleared, in order to identify the Cambodian position *vis-à-vis* Article 5 in terms of clearance plans
- Obtain latest possible data on land use and poverty in order to further scope the mine problem in Cambodia, through the existing JICA and WFP methodologies
- Engagement of all practical means to improve cost effectiveness of mine clearance
- Conduct a KAP survey to identify impact of MRE and adjust funding levels and information vectors accordingly
- Survey Cambodia to quantify the overall problem of disability in Cambodia.
- De-linking of mine victim assistance as a means to raise funds for mine action from provision of disability assistance services.

3. Funding Arrangements for Mine Action

Key Issues

- Funding for mine action has been at a high level for several years. However, there are signs of donor “fatigue” and decreasing funding for the future.
- In many cases, existing funding mechanisms do not include incentives for efficiency or mechanisms for quality assurance in mine action activities.

As illustrated in Annex 1.1, several donors currently provide funding for a wide variety for mine action activities in Cambodia. The primary method for funding these activities is simply a grant to a service provider. Grant funding for mine action has been traditional since the work began in Cambodia. Mine clearance activities have been characterized as “humanitarian” mine action, with the priority on saving lives and preventing injuries. Financing mine action on a grant basis can be seen as an extension of post-conflict emergency funding.

Three professional demining organizations are the main recipients of mine action grants: CMAC, the Halo Trust and MAG. In general, these three organizations use grant funds to carry out programmes of mine action that they have designed. The RCAF has also reportedly carried out demining on road and other infrastructure projects using Government funds or proceeds of loans to the Government from international development banks.

CMAC. The largest amount of grant funding goes to CMAC. Donors provide funds and in-kind contributions of expertise and equipment. Funds are provided in two ways: directly to CMAC for specific projects and through the UNDP Mine Action Trust Fund. Trust Fund contributions may be earmarked for projects or given for general institutional support.

Trust Fund and bi-lateral contributions to CMAC are presented on Table 3.1 below.

Table 3.1
Cash Contributions to CMAC 2001-2005 (US\$)⁵

Year	UNDP Trust Fund	Bi-lateral Projects	Other Income	Total Income	% UNDP Trust Fund	% Bi-lateral Grants
2001	4,746,878	2,602,852	108,453	7,458,183	64%	35%
2002	6,205,854	4,359,533	263,555	10,828,942	62%	35%
2003	5,188,449	3,862,598	1,421	9,052,468	57%	43%
2004 ⁶	4,521,412	5,017,871	n/a	9,597,192	47%	53%
2005 est.		6,900,000				

The data above illustrate the gradual decline in both absolute and relative terms of the importance of the contributions to CMAC through the UNDP Trust Fund. Conversely,

⁵ Sources: CMAC Annual Reports and Work Plans

⁶ The data for 2004 are as of 31 July 2004, but they are likely to approximate full year contributions.

bi-lateral contributions are rising both absolutely and as a proportion of total CMAC resources. Some Trust Fund donors have decided to shift their support from mine action to other thematic areas; other bi-laterals who plan to continue to supporting CMAC have expressed the desire to give greater visibility to their contributions than the Trust Fund now affords.

In addition to the cash contributions described above, CMAC's resources are augmented by in-kind contributions from several donors. This year, for example, Japan is providing brush cutting, transport and protective equipment worth \$16.0 million. Belgium, New Zealand and Japan have been providing technical advisors in such specialties as disposal of explosive ordnance, training, logistics and information technology.

Halo Trust. For the current year, the Halo Trust is receiving grants for mine action from five bi-lateral donors and five international NGOs. The Trust's budget for 2004, which cannot be precisely calculated as some project budgets are not on a calendar year basis, is estimated at around \$4.0 million.

MAG. MAG also has diverse funding base, receiving grants from six bi-lateral and multi-lateral donors and four international NGOs. MAG's 2004 budget, which like Halo's is difficult to calculate for the calendar year, is roughly \$3.5 million. In the case of MAG's NGO donors, funding is provided as a fee for services. The NGOs hire MAG to clear mines in designated areas where they are implementing development projects. These arrangements are established as partnerships based on memoranda of understanding rather than as commercial transactions.

RCAF. World Bank and Asian Development Bank reported that their rural road rehabilitation loans require the Government to undertake mine clearance for the road right-of-way. Thus, it appears that RCAF is funded directly by the Government from loan proceeds or counterpart funds. The mechanism by which the Government provides funds to RCAF to do mine clearance is unclear.

Quality Assurance. The CMAA Secretariat is theoretically responsible for licensing of demining operators in Cambodia and assurance that their work meets technical quality standards. In practice, the Secretariat does not have sufficient capacity to fully implement either of these functions. Thus, demining operators are largely self-regulated. CMAC's approach to quality assurance is to review, strengthen and implement its own standard operating procedures (SOPs) for demining and EOD. Similarly, both Halo Trust and MAG follow their own strict operational protocols for demining and EOD.

Performance and Financial Monitoring. During 1999-2000, CMAC encountered serious financial management problems. Auditors rated CMAC's internal controls "seriously deficient" in 1999. Since then, CMAC has been striving to improve its management, performance review and accountability. A management and financial audit conducted by Ernst and Young Malaysia for the period 2002-03 rated CMAC as "satisfactory" and verified progress towards implementation of previous audit recommendations. In

February 2004, CMAC received ISO 9001 certification for its operational processes (though not its results).

Donors monitor of their financial contributions to CMAC as well. This monitoring consists of a variety of financial management and performance review processes. UNDP project assistance for CMAC and the UNDP Trust Fund require regular progress reports, financial reports and joint review meetings. Bi-lateral donors do their own monitoring and supervision to varying degrees of rigorousness.

To implement their accountability standards, Halo Trust and MAG both rely on international professional managers, standard accounting and reporting procedures and regular financial audits.

Analysis

The current grant-based funding arrangements for demining operations do not encourage efficiency or accountability. This conclusion applies to both Trust Fund and to most bi-lateral grants to CMAC. In some cases, however, bi-lateral donors have established stringent financial and technical monitoring arrangements⁷.

Under current funding arrangements, donors pay the three main professional demining operators on the basis of the operators' perception of their costs. Each operator uses a different method to calculate its costs. Despite these differences, the donors are essentially price-takers and do not appear to challenge the deminers' costs. In other words, there is no market for demining services and consumers (donors) pay the asking price. (In the case of RCAF, the funding arrangements with the Government are not transparent, but the military appear to be another grant recipient.)

In the absence of competitive pressures, the incentives to reduce costs and innovate are weak and rely wholly on self-motivation by the demining organisations. For example, MAG, which has pioneered a low cost demining technique, "proximity demining", under which local residents are trained and supervised by MAG to carry out demining in their districts, developed this approach not primarily for cost reduction, but to enable income generation in rural areas. However, MAG recognise it has interesting implications for cutting costs (as modeled in the analysis at Annex 2.4).

The lack of competition for demining services has also served to maintain the high labor costs of demining services. Demining wages were set at high levels when UNTAC commenced demining due to the perception that demining was "dangerous work" and that deminers were putting their lives on the line. Given the relative ease of training deminers, the industry's safety record, and a large pool of unemployed willing to work for lower wages, this assumption should be re-examined.

⁷ Not all of these restrictions are helpful: at least one donor will pay deminers' salaries but not those of the local staff employed in the headquarters, which is designed to stop waste but is unfairly punishing to organisations that already have a small central management team. Changing to an output-based contracting arrangement should allow avoidance of such problems.

In addition to having no control over prices, the donors have little or no control over the quality of the work that they are paying for. Most receive no competent independent verification of demining results. While some donors vigilantly monitor the projects they fund, most donors lack the technical competence to assess the quality of the results obtained. The common measures of results in demining – number of mines cleared, costs of clearance in cents per square meter – provide interesting information, but they really don't tell the donors whether they got their money's worth.

Recommendations

- Open up eligibility for UNDP Trust Fund resources to all qualified demining operators.
- Use the Trust fund to fund demining on the basis of competitive bidding.
- Target the Trust Fund on provincial demining priorities determined by the MAPU process.
- Establish independent quality control for Trust Fund demining contracts.

The recommendations here apply to the UNDP Trust Fund, the only element in the funding arrangements that is relatively easy to adjust. However, the team recommends that bi-lateral donors consider the rationale for these changes in the Trust Fund arrangements as it may apply to their bi-lateral funding.

The UNDP Trust Fund should be re-constituted as the UNDP Demining Trust Fund and should fund demining services on the basis of competitive bidding. The Trust Fund should be targeted on the unfunded provincial priorities identified by the provincial process for planning and prioritization of mine clearance that is facilitated by the Mine Action Planning Units in each of the five heavily-mined northwestern provinces. In other words, the Trust Fund would provide a mechanism to support the de-centralized decision-making of provincial governments on their demining priorities. Trust Fund contracts should be large enough to attract new entrants into the demining business in Cambodia and to enable demining operators to maintain orderly workflow and staffing arrangements.

The arrangements for the new Trust Fund should include:

- An advisory committee comprised of representatives of the contributing donors and the CMAA. This committee would address policy issues such as resource allocation among provinces.
- A Trust Fund manager. UNDP could manage the Trust Fund directly or outsource management to a professional procurement agent. Other management options to consider include other UN procurement agencies (UNOPS or IAPSO), another donor organization or a project dedicated to the management of the Trust Fund.
- A Contract Supervision/Quality Assurance capacity. Demining services provided on a contractual basis will require the technical and supervisory capacity to carry out quality control and certification for payment that services have been delivered in accordance with contracts.

- Start-up assistance to design a template contract or contracts for demining services, criteria for short-listing and selection of contractors, operational policies and procedures for the Trust Fund, and the establishment of links with provincial governments.
- A gradual phase-in period while the existing trust fund arrangements phase out.
-

Further specifications for the proposed trust fund are provided in Annex 3.1.

Impact on CMAC. What impact would the revision of current trust fund arrangements have on CMAC? An abrupt shift in funding would of course be disruptive for CMAC. However, as noted above, the new arrangements should be phased in gradually to avoid disruption. What's more, CMAC is likely to win its share of contracts from the new trust fund which would serve to maintain its income stream.

In the longer term, the shift to contract funding should further stimulate ongoing trends in CMAC towards improved productivity. These include, for example, the integration of dog teams with brush-cutting teams and manual deminers, improved cost accounting, and cost cutting measures.

4. National Institutional Arrangements for Mine Action

Key Issues

- The CMAA has not been effective. The Authority has too many assigned responsibilities and many of these responsibilities overlap with those other agencies.
- The arrangements for de-centralized planning and prioritization of mine clearance strengthen ongoing Government efforts for de-centralization to provincial authorities.
- RCAF has the potential to provide a mine action sustainable capacity, but there are persistent doubts about the ability of RCAF to meet national standards at present.

Overview of Legal and Policy Framework. The legal and policy framework for mine action in Cambodia consists primarily of the decrees, sub-decrees and policy statements that pertain to:

- the Cambodia Mine Action and Victim Assistance Authority (CMAA);
- the Cambodia Mine Action Centre (CMAC);
- the arrangements for socio-economic management of mine clearance in the provinces (PMAC and MAPU) and the related arrangements for allocation of cleared land;
- RCAF.

CMAA

Legal Framework. Royal Decree No. 177 (6 September 2000) constitutes the CMAA as an inter-ministerial body chaired by the Prime Minister. The CMAA is to “manage all clearing activities of remaining land mines and unexploded ordnance and the assistance to victims of landing mines”, to act as the sole representative of the RGC at international meetings on land mines, UXO and victims’ assistance, and to sign on behalf of the RGC “any agreements, protocols and contracts of bilateral aid regarding mine action and unexploded ordnance clearance, and assistance to victims...”⁸

Major responsibilities of CMAA listed in the decree⁹ include:

- development of policies on mine action and UXO clearance and assistance to victims;
- coordination of all mine action and UXO clearance and assistance to victims;
- mobilization of technical and financial resources within Cambodia and abroad;
- licensing national and international demining operators working in Cambodia;
- managing a database on mine action and UXO clearance;
- development of a policy on the use of demined land; and

⁸ Article 2 of Decree No. 177

⁹ Article 3 of Decree No. 177

- implementation in Cambodia of the Ottawa Convention on land mines.

Subsequently, Sub-decree No. 76 (dated 8 August 2001) set out the organization and functioning of the CMAA. The operational arm of the CMAA is its Secretariat General. The Secretariat is headed by a Secretary General assisted by two deputies. The Secretariat is to have six functional departments.

Analysis of CMAA Performance

Management. The CMAA Secretariat's operational effectiveness is seriously undermined due to the lack of confidence on the part of international donors and demining operators in its Secretary General. While all parties maintain cordial relations, the level of distrust is such that these key stakeholders simply do not take the Secretariat seriously and keep their interactions with it to a minimum. In this environment, the Secretariat cannot provide meaningful coordination or policy guidance for mine action. Most agencies working on mine action ignore the Secretariat and deal directly with each other as necessary.

Organization and Staffing. The high-level inter-governmental body chaired by the Prime Minister that constitutes the CMAA has never met. As a result, the functions of the CMAA are carried out directly by its Secretariat¹⁰. As established so far, this Secretariat is comprised of a Secretary General, three Deputies, and 34 staff members. The staffing arrangements include four personnel working on the database who are paid by CIDA and seven personnel working on monitoring and socio-economic management who are paid by DFID. Thus, only 23 of the staff are Government employees.

While Departments have been established within the Secretariat, the personnel seem to be informally organized around a set of technical functions – planning, laws and regulations, monitoring, database management and mapping, and socio-economic management of mine clearance – and administrative functions. The technical functions receive a significant degree of donor support.

Functional Analysis. The relevant decree sets 14 major responsibilities for the CMAA. The Secretariat does not have sufficient capacity to implement them. There are a number of questions about whether the CMAA is the best home for certain functions. Further, some of the functions are highly technical and would be impossible to implement without substantial external assistance. Indeed, at present, most of the outputs produced are the products of international experts and consultants and donor-supported national staff attached to the Secretariat.

The status of implementation of the Secretariat's functions is reviewed below:

- Policies and strategies on mine action and UXO clearance are prepared by the UNDP Chief Technical Advisor attached to the CMAA Secretariat. Virtually all of these documents are circulated as drafts that have yet to become final versions.

¹⁰ In common parlance, when people refer to the CMAA, they are actually referring to its Secretariat.

- Coordination of mine action is in transition. The sub-decree on socio-economic management of mine clearance has de-centralized much of this function to provincial authorities. At the national level, past efforts of the Secretary-General to coordinate donors have not been successful. However, the Council of Ministers has recently convened a Government-Donor working group on mine action to prepare for the Consultative Group meeting in December. Up to the present time, however, the donors have been holding their own coordination meetings. Similarly, NGOs have set up a Mine Action Forum to share experience and address issues of common interest.
- The Disability Action Council (DAC) coordinates assistance to victims of mines and UXO as well as assistance to all other persons with disabilities in close collaboration with the Ministry of Social Welfare. The Secretariat has not attempted to establish any capacity in this area.
- The mobilization of technical and financial resources within Cambodia and abroad is *de facto* carried out by the donors and demining operators, though the Secretary General has attempted to mobilize financial resources at international meetings on mine action.
- The Secretariat has issued all four demining operators with “provisional” licenses. The licensing process lacks transparency and subsequent field inspections are reported by observers to be sporadic and perfunctory exercises.
- Government and donor-supported staff maintain the Secretariat’s database and archives on mine action and UXO clearance. An international consultant does the analytical work. Demining operators do not rely on the database unit’s maps however. Each demining operator does its own survey and mapping.
- The policy on the socio-economic management of mine clearance and related guidelines were prepared by the UNDP Chief Technical Advisor. An official Government sub-decree was actually passed to implement this policy. This sub-decree, which in effect de-centralizes most of the planning and coordination work on mine action to provincial authorities, is potentially the CMAA Secretariat’s most important achievement. Monitoring the implementation of this policy in the provinces is beyond the capacity of the small central staff, however.
- The Secretariat is responsible for implementation of Cambodia’s obligations under the Ottawa Convention on land mines. The Secretary General will report on national compliance to the Convention at an international conference in Nairobi in December 2004 and seek to mobilize resources for Cambodia.
-

Given the general and specific problems cited above, some re-consideration is in order to determine whether or not these functions are to be carried out in the future and if so, by whom.

In order to devise recommendations for CMAA, the consultant team reviewed the Authority’s assigned functions and considered the advantages and disadvantages of options for their disposition. This review of options with advantages and disadvantages of each is presented in Annex 4.1. The five options considered were:

- 1) do nothing;

- 2) transfer the function to another agency;
- 3) outsource the implementation of the function while the Authority retains responsibility for it;
- 4) strengthen the existing function; or
- 5) re-design and strengthen the function.

On the basis of this analysis, the consultants have concluded that the CMAA Secretariat should focus its limited capacity on a narrower set of functions. The recommended disposition of other functions now assigned to CMAA is described below.

Recommendations for the CMAA Secretariat

The CMAA Secretariat should focus on a shortlist of core functions and consider transferring some functions to other appropriate agencies. If and when donors are satisfied with the management arrangements at the Secretariat, they may wish to provide capacity development assistance or operational support. The core functions should be limited to:

1. National policy making related to mine clearance and UXO;
2. Providing guidance on national plans and priorities to de-centralized provincial MAPUs;
3. Preparing an annual report on mine action based on reports submitted by mine action operators and an annual consolidated report on MAPU activities based on reports submitted by provincial authorities;
4. Establishing and maintaining standards for mine action;
5. Management of a donor-supported arrangement for outsourced licensing and quality assurance of demining operators;
6. Mobilizing national and international resources for mine action;
7. Acting as Government representative and the secretariat for the implementation of the Ottawa Convention.

For the following functions, CMAA could retain a focal point, but operational responsibility should be transferred or confirmed to reside with other agencies as follows:

1. Mine risk education should be carried out by demining operators and integrated into Ministry of Public Health IEC programmes and Ministry of Education in and out of school programmes wherever it is appropriate.
2. The policy on the use of land cleared of mines and its implementation should be clearly designated as a responsibility of the Ministry of Land Management.
3. Mine and UXO mapping, databases, and archives should be cleared designated as a responsibility of the Ministry of Land Management at the national and provincial levels. Provincial DLM staff should lead or take active roles in provincial MAPUs.
4. The responsibility for coordination and resource mobilization for mine and UXO victims' assistance should be clearly defined as the responsibility of the Disability Action Council.

CMAC

Legal and Policy Framework. Royal Decree NS/RKT/0801/264 (dated 8 August 2001) revised the legal status of the CMAC and established it as “a national institution to provide mine action services for humanitarian and development projects.” As a result, the policy making and regulatory functions related to mine action were transferred to the newly created Cambodian Mine Action Authority and CMAC continues in the role of mine action service provider.

Under the decree, CMAC is to carry out the following programmes: mine awareness, minefield information and survey, mine clearance including explosive ordnance disposal, and training in mine action. The priorities for implementation of these programmes are:

- humanitarian purposes in high casualty areas;
- economic purposes for the expansion of agriculture, rehabilitation, national reconstruction or development projects.

Review of CMAC

The review team was not tasked nor did it have time for a detailed assessment of CMAC’s performance. The following observations synthesize the views of key informants and the findings of other evaluations.

CMAC is the largest professional mine action service provider in Cambodia both in terms of size of its budget – currently around \$10.0 million per year - and the amount of land reported as cleared – 971 hectares in 2003. As a Government organization, CMAC is also the recipient of large amounts of official development assistance from international donors over and above funds for mine action operations. This assistance is in the form of funds for institutional support and in-kind grants of technical assistance and equipment.

Observers of CMAC’s performance, both insiders and outsiders, report a full spectrum of views, all of which can be seen to contain kernels of truth. At one end of the spectrum are CMAC champions who view the organization as a unique success story in Cambodia: a national institution that is actually doing its job and performing at international standards of accountability. Indeed, a number of observable elements bolster this position: CMAC’s articulate and forward looking management, ISO 9001 certification, satisfactory audit ratings, timely and informative reports, persistent self-improvement efforts, openness to new ideas, and a record of verifiable results.

A less charitable point of view regards CMAC as an organization that doesn’t work very well, but can be made to perform provided that there is a high degree of conditionality and supervision of its performance.

At the other extreme are credible observers who report widespread rent-seeking behavior, reluctance to innovate (e.g., the persistence of two men per lane demining), excessively high operating costs, and a high level of absenteeism.

Recommendations for CMAC

Given the diversity of credible views above, the review team is reluctant to offer definitive prescriptions for CMAC. The organization should obviously continue to build on its strengths. To provide further impetus to operational efficiency, the team recommends 1), a gradual exposure to market forces in creation of a market place for demining services among donors (see chapter 6 below) and 2) a bit less largesse on the part of its donors so that CMAC will be motivated towards financial self-sufficiency.

Socio-Economic Management of Mine Clearance in the Provinces

Legal Framework. The Council of Ministers recently passed the sub-decree entitled “Socio-economic Management of Mine Clearance Operations” on 17 September 2004. This sub-decree essentially de-centralizes the planning and prioritization of mine clearance operations to the provincial level. The provincial governor is responsible for ensuring that all mine clearance activities are in compliance with national strategy, plans and regulations for mine clearance and that they have taken into account commune development plans. The provincial governor must ensure transparency and fairness in the allocation of cleared land. Land to be allocated to the landless poor shall be in accordance with the sub-decree No. 19, “Social Land Concessions” (dated 19 March 2003).

Review of Socio-Economic Management of Mine Clearance. The new sub-decree sets out successor arrangements for the Land Use Management Unit (LUPU) mechanism that was established in 1998 in the five heavily contaminated northwestern provinces to assist in the selection of land for demining and the allocation of demined land. An evaluation of the LUPU support project¹¹ found serious capacity deficiencies in the LUPUs and a tendency for their processes to be dominated by demining operators and NGOs. The new sub-decree empowers provincial authorities to plan and prioritize demining in their provinces and thereby significantly strengthens the LUPU mechanism, henceforth to be known as MAPU (Mine Action Planning Unit). A team of five Australian Volunteers has just been fielded to address MAPU capacity issues. Some funding for MAPU operations will be provided through the Seila/PLG programme. A yet to be finalized CIDA-funded project may provide GIS mapping services and/or support the development of provincial GIS mapping capacity. The CMAA Secretariat is also attempting to direct and participate in the MAPU activities.

At this writing, a number of challenges face the MAPU mechanisms:

- how to operationalize the prioritization of areas to be cleared; what selection criteria should be applied with what weights (see Chapter 5, Approaches);
- how to build ownership among provincial officials for an objective process of priority-setting; how the process will be made transparent;

¹¹ Report of an external evaluation of the Handicap International Belgium project “Support for the planning of demining and the utilization of demined land in Cambodia, commissioned by the French Ministry of Foreign Affairs, October 2003.

- how to build harmonious relationships with demining operators that enable the reconciliation of their preferences with provincial demining priorities;
- how to engage the provincial Department of Land Management in land allocation and titling processes for cleared land;
- how and whether the CIDA project can be effectively integrated into the work of the MAPU and the provincial Department of Land Management.

In addition, no plans have been made yet for a MAPU process in other provinces with landmine contamination.

Recommendations for Socio-Economic Management of Mine Clearance

The Ministry of Land Management should be formally tasked with responsibility at the provincial level for the implementation of land management procedures – land allocation and land titling – that are embedded in the MAPU process. Overall responsibility for MAPU activities should remain with the Provincial Governor. At present, the MLM does not appear to be ready to assume this role in all MAPU provinces so there may be a one-two year transition period. In the meantime, donor resources should be targeted on strengthening the relevant PLM capacities and related central MLM support capacities rather than supporting parallel systems in the MAPUs.

Donor resources devoted to supporting MAPUs should be harmonized in concept and practice. The joint steering committee set up under the AVI project should provide the appropriate venue for coordination. As a matter of urgency, the CIDA-funded project needs to be clearly integrated into provincial arrangements and its role in capacity building clearly defined.

RCAF

There is a general need to increase the volume of mine clearance capability in Cambodia, and some donors have wondered whether RCAF can be used more in this regard, especially as they have a potential to operate in a sustainable manner once international funding has ceased.

Policy Framework. The Royal Cambodian Armed Forces (RCAF) have been assigned a role in mine action by the Government for the clearance of mines and UXO that affect infrastructure projects, such as road construction or rehabilitation. The CMAA Secretariat has issued RCAF with a provisional license as a demining operator.

Review of RCAF Operations

Data reported by the CMAA Secretariat attribute one half of all demining carried out in Cambodia to RCAF. The review team was unable to obtain detailed information regarding RCAF operations, such as maps, clearance reports or financial reports, or to view ongoing clearance activities. In addition, all of the professional demining operators are highly skeptical of the reported statistics.

Previous analysis of RCAF's capability has expressed doubts of their ability to conduct mine clearance to a suitable standard¹². The Team visited the RCAF engineering command but was unable to obtain evidence to refute the doubts that have been expressed by previous observers. RCAF officers also openly described their lack of equipment and the training to operate it.

From fragmentary information assembled from a number of sources, it appears that RCAF has been engaged in mine clearance on road projects funded by the World Bank and ADB. The RGC has apparently used loan proceeds or Government counterpart funds to finance RCAF to demine road right of ways. The clearance methodology is unclear, but given the huge areas involved, manual demining would not have been possible. The large reported clearance areas are likely to be the result of multiplying the 30 to 40 meter right of way by the length of a road.

Anecdotal evidence suggests that RCAF's clearance methods are unsafe and that accidents have occurred. RCAF's involvement in demining has also brought accusations of land-grabbing of cleared land, though the Team was unable to verify these allegations. Nevertheless, RCAF may become the residual home for mine action and/or UXO disposal after the wave of donor-funded activity passes in a few years so there is a need to engage RCAF in mine action in a manner that will encourage responsible demining.

Recommendations for RCAF

RCAF could be engaged more directly in mine action through the following range of mechanisms, which are set out in terms of the ease with which they could be introduced in the short term.

- Option One. Provide labour for qualified demining organisations. This would allow donors to interface with an organisation capable of meeting liability requirements. It would also allow RCAF personnel to receive on-the-job training in mine action project management and equipment operation and so prepare them for a time when they would be operating independently of any donor assistance.
- Option Two. Ex-RCAF personnel could be engaged as civilian deminers under a Demobilisation, Demilitarisation and Re-integration (DDR) project, such as that successfully piloted in Afghanistan. This could be linked with the provision of a small parcel of land to each demobilised soldier at the end of his engagement as a deminer.
- Option Three. Provision of technical assistance to RCAF to allow RCAF to compete directly for infrastructure projects. This would involve letting a contract for an agency to provide the technical assistance service to RCAF. However it is not possible to guarantee that RCAF (or indeed any one particular demining agency) would win the bids in a tendering process.

¹² See the Cambodia case study in the GICHD "Role of the Military in Mine Action" 2003.

- Option Four: Train and equipping a sustainable EOD capability within the Police or Army, in order to ensure there is a residual EOC capacity in Cambodia even after foreign donations cease. This would involve training and equipping but not provision of operating costs for the EOD teams.

All of these options would allow the development of a truly sustainable capacity to a greater or lesser extent. Option One has the advantage in that it would be easier to initiate in the short term and would allow customers to feel confident in the quality of the results whilst also allowing capacity development within RCAF.

Royal Cambodian Police

As mentioned above, there is potential in the police force for the development of an EOD capacity. This would build on the recent successes with the Small Arms and Light Weapons (SALW) reduction program. Indeed, it would be an important adjunct to such activity as the police are reportedly receiving items of ammunition and explosives when they tour villages to collect weapons.

Furthermore, the police have an important potential role in collecting and passing on information about UXO to EOD teams, and at present there is no national policy for this¹³.

Cambodia Mine Victim Information System (CMVIS)

CMVIS, conducted jointly by the Cambodian Red Cross (CRC) and Handicap International, is probably a world leader in terms of mine victim data collection and its resources are invaluable in problem analysis (and indeed in the preparation of this report). There are some criticisms about the data collection methodology. For example, in Chapter 2 above, CMVIS data report that schoolchildren who are mine accident victims have not received MRE. These data may be the result of interviewees not wanting to admit that they had been warned. There are similar suggestions that ‘tampering’ casualties don’t like to admit that they were scavenging for scrap metal leading to a suspiciously large number of adult UXO victims ‘playing’ with UXO. However, these are comparatively minor problems with the CMVIS product, and CMVIS personnel appear to be objective and eager to develop their data collection methods. Unfortunately, at the time of writing CMVIS is suffering a potential funding shortfall (a shortfall of \$40,000 for 2005). Hopefully this will be resolved in the near future as it is a resource too important to lose.

The funding shortfall issue does suggest that even the CRC is a truly sustainable home for CMVIS. It would be rational to consider housing CMVIS within a government institution or under the aegis of the Disability Action Council (DAC). This would allow similar data gathering methodology to be used to chart general disability problems (such

¹³ As voiced in the workshop on UXO Tampering held on 2 Dec 2004.

as the Road Traffic Accident Victim Information System (RTAVIS) being developed by Handicap International) in a sustainable manner.

Interestingly, CMVIS is a core national function that is currently managed outside of CMAA but is responsive to national policy coordination. This would appear to act as supporting evidence for the 'outsourcing' of some CMAA functions as proposed above.

5. Understanding Approaches to Mine Clearance

Key issues

- There is a general concern amongst respondents that demining is slow and expensive.
- Given that there is more of a contamination problem than there are resources available to deal with it, prioritisation strategies must be developed to allocate resources in the most effective manner possible.

Description

There are three main tools in the demining “toolbox”. These are:

- Manual mine clearance, by which a deminer uses a combination of a metal detector and hand tools to search land
- Mechanical devices, which are primarily used in the Cambodian context to clear vegetation and remove the threat of tripwires
- Mine detection dogs (MDD) which are trained to react to the smell of vapour from landmines and indicate their presence from a safe distance.

These tools will be considered in more detail in the chapters below on standards (Chapter 6) and techniques (Chapter 7).

Traditionally, demining activities in Cambodia used to be based on large teams working in suspected mined areas to clear large areas that had been reported (perhaps as far back as the UNTAC period in the early 1990s) as being potentially mined. All three of the main mine action implementing agencies (CMAC, HALO and MAG) now field a number of smaller, more flexible teams that are more geared to problem solving than simply clearing large areas of suspected land. These smaller teams may operate in an integrated manner with MRE and EOD personnel available to solve problems ‘on the spot’ after a consultative process with the target community. However, there is no standard way to organise of mine clearance assets, and a number of larger demining ‘platoons’ are still fielded by CMAC.

Analysis

An analysis of mine clearance can be simplified by the following questions¹⁴:

- Are mine clearance teams doing *the right job*?
- Are mine clearance teams doing *the job right*?

¹⁴ Thanks to Ted Paterson of GICHD for the description of these questions

“Doing the job right” is the subject of Chapter Six (Standards). The question considered here is: are we doing the right job?

In the past, lack of adequate casualty data, plus a lack of understanding of the impact of mines on local communities meant that demining teams were deployed on areas where contamination had been found or was suspected. CMVIS has allowed re-prioritisation based on casualty data but this creates a tension between agencies as this still suggests a single criterion approach and not all agencies are primarily focused on the numbers of casualties. Furthermore, the number of casualties is remaining comparatively constant and this could be misinterpreted as suggesting that clearance is having little or no impact. There are other problems to the use of casualty data as a single criterion. These include:

- Concentrating response on solely areas that have casualties may be, in effect, penalising communities that are trying to adopt safe behaviour¹⁵
- There is insufficient data to confirm that casualty numbers will not go up in ‘lower casualty’ areas in the future, especially where demand for land increases
- There is a question about how casualty data can be interpreted: current practice appears to focus on absolute casualty numbers whereas it may also be appropriate to consider the risk of injury per head of population as a means of addressing equity problems¹⁶ in terms of access to emergency intervention.

It would be more appropriate to consider landmine contamination as a multi-criteria problem, of which casualty numbers are an important – but not the only – criterion.

Indeed, casualty numbers themselves appear to be a symptom of three main dimensions:

- The physical presence of landmines
- A demand for the land
- A willingness to enter the land, perhaps even when ‘mine aware’

When any one of these dimensions is not present, there is unlikely to be a casualty. This means that there are indeed different *potential* solutions to the casualty problem, including:

- Removing the landmines
- Removing the demand for the land, through provision of alternative livelihood possibilities, where such activity is feasible

¹⁵ Handicap International staff were able to suggest several areas where communities are refraining from entering suspected mined areas

¹⁶ For example, CMVIS data for 2003 shows 5 casualties in Mondulkiri and 169 for Battambang. Absolute numbers suggest that the problem is more than 33x bigger in Battambang. However, when adjusted for population, Mondulkiri has a population of around 40,000 and Battambang has a population of around 962,000. Therefore the risk per 1000 person is 0.125 in Mondulkiri and 1.76 in Battambang.

- Removing the willingness to enter the land, perhaps by more focused MRE and better marking

Experience with the community-based mine risk reduction approach now being followed by CMAC/Handicap International and by MAG may provide further data on the efficacy of the last of these interventions: the potential benefit of a KAP study to provide objective data on the efficacy of MRE would also help understand this issue as mentioned above in Chapter 2 on “Scoping the Problem¹⁷”.

Once one has controlled for the awareness of the situation, the question may still be viewed as being one of the presence of contamination plus the demand for land. This can provide the basis for a simple multi-criteria analysis (MCA) that could help focus resources on the areas that will have the greatest overall impact on casualties and development. It may also allow for the consideration of alternative livelihood strategy interventions as more cost-effective options on a case by case basis. Existing drafts from CMAA on socio-economic guidelines for mine action recognise the need for such criteria but as yet none have been proposed. Such criteria could include:

- Numbers of casualties (on an absolute and ratio basis)
- Extent of contamination
- Future plan for land use, including land tenure
- Development priorities and projects
- Population size/migration/trade routes
- Logistic convenience (i.e. it may be more efficient to move demining assets to contiguous tasks)

The Team have discussed these ideas extensively with personnel from the two projects involved in this issue, Australian Volunteers International (AVI) and GeoSpatial International (GSI). There is a growing MCA industry and there is a risk that procedures could become too complicated and unworkable. The team recommends a COST approach to MCA, whereby the criteria and the MCA framework must be:

- Clear
- Objective
- Simple
- Transparent

¹⁷ There are differences in opinions amongst respondents about value of MRE and marking (see above) though there is a persuasive case that new settlers may know less about their immediate environs than old established populations.

Furthermore, it is important to establish the criteria and build the analytical framework before the framework is populated with data from real potential projects, as there is a risk that planners will bend criteria to fit a pre-conceived idea of priority.

This leaves the question of to what extent management of this issue should be retained at the centre or delegated to local authorities. This question is discussed in more detail in the chapter on Institutional Arrangements (Chapter 4), but in principle the Team endorses the view that detailed priority setting should be carried out at the provincial level building on the existing Mine Action Planning Unit (MAPU) structures. The Team notes that there are only MAPU structures in five provinces, even though the landmine problem extends beyond these provinces (and the UXO problem is of course even more extensive). Whilst recognising the value in minimising transaction costs through keeping the number of MAPU small, there is a risk that this will create an institutional bias towards directing mine action resources into these provinces even where there is (or where there may become) a valid need elsewhere. This suggests a role for the centre in monitoring the situation and intervening to establish further MAPU (or something with a similar role but of a smaller scale to deal with UXO problems) as the need arises.

Recommendations

- Mine clearance prioritisation should be regarded as a multi-criteria issue
- Criteria setting and analysis should be clear, objective, simple and transparent
- The MAPU process should be reinforced to facilitate objective prioritisation within general national guidelines.
- The extent of the MAPU program should be reviewed periodically in order to ensure that adequate cover is provided to the non-MAPU provinces as appropriate.

6. Standards

Key issues

- Current demining program and practices do not meet demand
- Large informal demining sector, adherence to standards is patchy
- Numerous discussions on ‘lowering standards’ as means of meeting requirement

Description

The number of mine accidents in Cambodia – continuing at around 800 per year¹⁸ suggest that the current mine action program does not meet the demand for clearance. Mine action agencies are only able to clear a fraction of the problem every year, and this has led to a growing number of ‘informal demining’ service providers who either clear their own land or who rent out their services – at a rate far below that charged by the formal mine action sector – to those willing to pay. Rates have been reported to the Team as low as \$60 (per Ha)¹⁹. Even recent shifts of demining focus to areas with the highest reported accident rates do not appear to have been having much effect on reducing the total number of accidents²⁰.

Even after removal of ‘bad land’ (such as rock outcrops and swamps) and land that has already been cleared from the Level One Survey, there is still a very large amount of land left to be addressed. The 2004-2008 plan by CMAA suggested that only 10% of the potentially contaminated ground would eventually need to be cleared, though this was an admitted guess by CMAA, and CMAA staff could provide no guidance on how to identify *which* 10% should be cleared.

A number of respondents have suggested that, as the current rate of progress of the formal sector is insufficient, and as it also appears to be ‘unsustainable,’ then a paradigm shift should be undertaken in order to harness the potential for informal demining.

There are also discussions of a number of possible ‘risk reduction’ strategies that would allow demining agencies to cover more ground more quickly for the same amount of funding. This is problematic as it is an area where current international standards²¹ provide little guidance on options that are available. Another option that is being discussed is, in essence, a re-survey of contaminated areas in order to re-define the problem, though it is difficult to see how this could produce a significantly different outcome if the same PRA/RRA techniques are used.

¹⁸ CMVIS

¹⁹ Rate quoted to an ADB consultant for clearance of a rubber plantation in the east of Cambodia.

²⁰ Although it is possible that accident rates could have been even higher without this intervention, given that there is a reported increase of settlement into contaminated areas

²¹ International Mine Action Standards (IMAS), compiled by the Geneva International Centre for Humanitarian Demining (GICHD).

Analysis

Firstly, it is possible to break down the question of ‘capacity shortfall’ into three component factors. These are represented in the diagram at Fig 6.1 below.

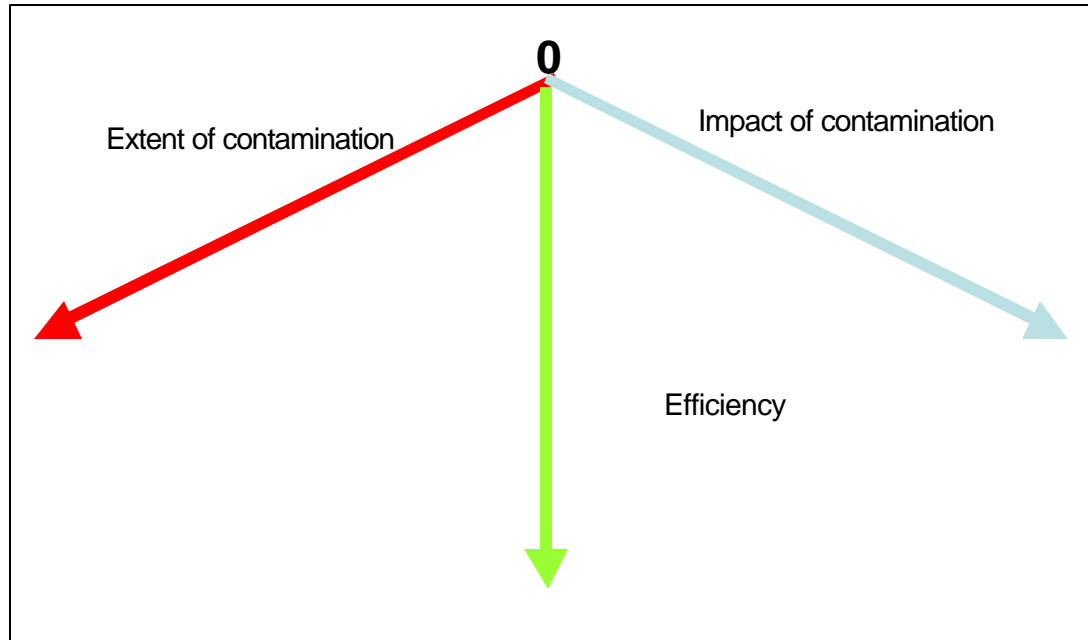


Figure 6-1. Factors contributing to shortfall in demining capacity

Essentially, one can establish that the problem gets worse the further one travels along any of the vectors away from point ‘0’. In other words, if the extent and the impact of the contamination are fixed, one can only improve the situation by varying the methodology employed to get more demining done for the money. This is what appears to be underpinning the aspiration to ‘reduce’ standards, either by engaging informal demining or by some sort of ‘risk reduction’ strategy. However, this is based on the false assumption that both extent and impact are fixed: as demonstrated in the chapter on scoping the problem, it is possible to reduce the extent of the problem by disregarding land that is of little or no economic value.

It is the belief of the Team that the problem can also be reduced by focusing on the impact question, and disregarding land that is reportedly potentially contaminated but that appears to be of no problem to local population – i.e. land that is already in use (see Table 6-1 below). Both of these concepts are used in the scoping exercise to reduce the potential contamination from approximately 4600km² to around 460km², though it may be possible to reduce this further²². Furthermore, incremental changes in efficiency (without changing

²² Coincidentally, this is around the same figure as the guess made by CMAA technical advisors referred to above, though perhaps with some clearer ‘decision science’ involved. The methodology used in this Report also allows identification of where this ‘10%’ can be found, as it is focussed on the disused farmland reported in the JICA land use map. As mentioned in the chapter on scoping, re-mapping the JICA data should provide an even smaller target area.

standards) would also improve the ability of existing methodologies to cope with the problem, as discussed in the chapter on funding modalities.

Table 6-1: Contamination categories for prioritisation				
Ser	Category	Description	Impact	Possible courses of action
(a)	(b)	(c)	(d)	(e)
1	Definitely Clear	Land that has clearance record, or is patently clear (such as concrete road)	Locals do not have a problem with using it. No liability issues from accepting this land as previously cleared.	(1) Accept land as cleared. No further mine action intervention necessary
2	Probably Clear	Land that appears to be clear, where locals have the land in use, there are no mine indicators (i.e. no records of contamination or casualty) but where there is no clearance certificate and where there may be isolated mines or UXO. Poor record keeping may disguise fact that land has already been cleared	Locals do not have a problem with using it, but there may be residual liability issues for management organisations.	(2) Disregard land for mine action prioritisation, as it does not appear a problem (3) Conduct some form of negative confirmation to improve confidence in land if it is of particular importance to do so
3	Probably Mined	Land that does not appear to be in use, where there are mine indicators nearby, but no specific mine indicators in the area under consideration	In general, locals do not use the land, though there may be evidence of some informal demining Clear risk for all types of land use	(4) Conduct area reduction (AR) to establish boundary of contamination where suitable AR means are available (5) Clear land using standard clearance techniques if it has sufficient value (6) Mark, fence and avoid land that does not have sufficient value
4	Definitely Mined	Land where there are specific indications of mine presence, such as minefield marking, mine incidents or visible mines or mine fragments	In general, locals do not use the land. Less chance of informal demining Very high risk for all types of land use	(5) Clear land using standard clearance techniques if it has sufficient value (6) Mark, fence and avoid land that does not have sufficient value

It is therefore possible to reduce the extent and the impact of the problem (by concentrating on land that is either probably mined or definitely mined, and that has intrinsic economic value) *to such an extent that there may be no need to discuss changes in clearance standards.*

On the other hand, one may feel that it might also be possible to benefit from reducing standards in order to either make more benefit from increased efficiency or to engage in a more ‘sustainable’ approach that will survive the end of international funding. Nevertheless, there remain several other significant problems in changing standards, and these are set out below.

For example, the Team members have heard suggestions framed as follows

“If we can achieve 80% of the solution with much less effort, this must surely be better than clearing a small area very thoroughly”

This is a very persuasive, even seductive argument. It is however based on several false premises:

- How do we know we have an 80% solution? The recent development in machine testing only measures the performance of machines in ideal circumstances.²³
In other words, even where a machine demonstrates 80% effectiveness (and there is some lack of clarity about what this means²⁴) in test conditions, because all minefields are different it would be impossible to assess what actual percentage effectiveness would be achievable in real life. Similar problems appear when trying to determine an 80% solution through manual means. In essence, formal manual demining is a binary activity: one either does it right or not at all. It would be impossible to persuade trained deminers to work faster, search less deep or ignore risks of mines and UXO buried in dense vegetation, as they would know that this was dangerous.

Whilst it might be possible to engage untrained informal deminers who were ignorant of such safety issues, this would leave questions of legal or moral liability, as discussed below.

²³ Paper by Dr Christina Mueller (presented at the EUDEM conference in Brussels, September 2003). Work by the German non-destructive testing agency (BAM) explains that the reliability of a demining system can be set out by the following function:

$$R = f(Ic - Af - Hf)$$

Where

R = System reliability

Ic = Intrinsic capability (performance in ideal conditions)

Af = application factors, including environment

Hf = human factors

²⁴ For example, does this mean that the machine can deal 100% effectively with 80% of mine types, that it will destroy 80% of mines in a minefield, covers 80% of the surface of the area, or that it has an 80% chance of destroying each individual mine?

- How do we define a contract? One of the major advantages with the current standard as defined in IMAS (i.e. that clearance should be 100% effective to a stated depth) is that it is very clear to measure and identify when the standard has not been met. Given the very low density of mines per m², even in a minefield, it is inevitable that a lower-standard contract may leave ‘permissible’ mines behind. This would be exacerbated in circumstances where an unscrupulous demining agency could gamble that an area is probably clear and report it as cleared *without taking any action to clear it*, as any mines subsequently found would be “the ones we were allowed to miss”.
- How to avoid liability. Given that the whole point of such activity would be to release land for subsequent use faster, it would be difficult to persuade end users that they should use land with ‘only 200 mines left’ after 800 had been removed from a field of 1000 mines (even assuming that we knew how many had been there) was actually safe to use. It would be difficult to construct a statement of certification of fitness to use that was persuasive enough to encourage people to occupy the land without then exposing all the agencies in the contractual chain to liability and potential litigation, especially as activity to cut costs at the expense of safety contravenes most national health and safety legislation as well as ISO 18000. This is an area where a sin of commission (engaging in less than safe activity) is probably more dangerous from a legal perspective than a sin of omission (observing others engage in less than safe activity)²⁵.
- How to avoid moral problems? The liability problem described above could also be described as a moral issue in circumstances where an agency might expect to escape the rule of law. There is also another, international dimension to this: donor countries have very high standards of clearance in their own territories (and many donor countries have areas of old military ranges or battlefields that are still being cleared today) and there is a significant moral ‘north-south’ question of whether it is acceptable to expect high standards of safety at home and then actively engage in less safe practices in a developing country.

Other standards issues

Nevertheless, there are some problems with international standards and their Cambodian counterparts (CMAS). The main problems are:

- The IMAS standard on post clearance sampling is expensive to implement, adding an additional 20-30% cost to existing demining programs (if it is actually done at all)²⁶
- The existing mapping and database suite, IMSMA (information management system for mine action) is clumsy and difficult to operate; Cambodia believes that funding is linked to adoption of this software and is spending considerable human resource effort on transposing data from existing and effective database management systems to IMSMA for no local benefit.

²⁵ Interestingly, the researcher undertaking current Handicap International study on village demining reports that he has, as yet, found no evidence that local population would choose an “80% solution” where there is a choice. He reports that 100% of all respondents have stated they would rather wait for full clearance. He believes this is because they feel that they are already living with an 80% solution and see no added benefit from any such intervention.

²⁶ Horvard Bach, GICHD

- The existing IMAS standards on technical survey and area reduction are weak and provide little or no guidance on how to implement such practices (See Chapter 7).

The situation can be summed up so far as follows:

- Informal demining is an indicator that current paradigm for the provision of mine clearance services doesn't work, and that people despair of the existing structures providing a solution to their problems
- There is an assumption that other faster and cheaper techniques (such as MRE, fencing) cannot solve the problem (see notes on techniques in Chapter 7 below)
- Scoping the problem appears to reduce the effective extent and impact of mine contamination
- There is also likely to be an effect on the mine action sector's ability to meet demand if funding mechanisms act to lower price of demining services
- Improving productivity is also key to improving the current situation
- International standards are not monolithic and there is some room for removing standards that provide unnecessary transaction costs (IMSMA) and implementation costs (quality control sampling)

What should be done if there is still a large shortfall between demand and supply?

Scoping the problem and introducing Incremental improvements in efficiency appear to have the ability to meet the demand providing that sufficient funds are available to support mine action at a rate of approximately \$16m per year for the next 10-15 years. However, while this does provide a light at the end of the tunnel it may be that this is still a tunnel that is too long for the international community. There is a spectrum of potential responses that provide alternative paradigms for mine action in Cambodia. These are set out below in Table 6-2 below.

Recommendations

- The shortfall in capacity should be understood as a result of three factors: extent of contamination, impact of contamination and clearance methodology. Scoping the problem can reduce the shortfall
- Better funding mechanisms can encourage efficiency (see Ser 2 in Table 6-2 below)
- It is difficult to operationalise 'lower standard' methods and this should be avoided
- There is room to reform existing standards to remove unnecessary burdens

- There is potential to train and equip sustainable national capacities in the Cambodian police and army to deal with residual problems (see Ser 4 in Table 6-2 below)

Table 6-2 - Alternative standards for mine action in Cambodia				
Ser	Paradigm	Description	Implications	Remarks
(a)	(b)	(c)	(d)	(e)
1	Trained and Managed	The current situation	+ No problems meeting standards - Problems meeting demand - Unsustainable	Unsustainable in terms of efficiency (as indicated by costs) and effectiveness (as indicated by large informal demining sector)
2	Trained and Managed and responsive to market	Proposed solution	+ No problems meeting standards + No need for sustainability - May still be problems meeting demand, though this should be dealt with through MAPU	Including responsiveness on price, use of proximity demining, and incentives for dynamic efficiency
3	The 80/20% solution	Use of machines to cover areas	+ Cheaper - Appears to help meet demand, but several large problems with definition and operationalisation	Sometimes described as 'quick and dirty'
4	National capacity development	Train and equip army and police	+ Cheap + Able to meet need for residual capacity - Not yet able to meet standards - Concerns about land grabbing	Could be a manageable approach in the medium to long term. See chapter on institutional arrangements
5	Trained and unmanaged	Providing training and equipment to informal deminers, but not managing them	+ Would help meet some demand - Would be unlikely to meet standards - Liability issues - Unlikely to assist ultra-poor	Could be possible exit strategy for international community if there is a continued shortfall. However, trained deminers are likely to work on contract for those who are able to pay rather than work for the ultra poor
6	Untrained and unmanaged	Complete disengagement from mine action sector by international sector	+ Cheap - Would not meet standards - May prevent development agencies in engaging in projects - Counter to desire to assist in mine action	

7. Techniques

Mine Clearance

There are a number of demining techniques in use in Cambodia. Many elements of these techniques are standard and present no issues for this report. The following notes concentrate on highlighting particularly good initiatives or areas for potential improvement.

Manual demining

Manual demining is the least controversial of the techniques at use in Cambodia. It still provides the mainstay of mine clearance and can be considered the ‘default option’ for conducting clearance. It is, however, very slow. As most costs are fixed it is very sensitive to increases in productivity and good management can wring significant increases in output. In many cases these can be simple management processes, such as the 23-day rotation developed by HALO Trust to minimise the impact of remote deployment on their deminers.

One noteworthy and positive development in Cambodia is the development of integrated mine action teams, such as the ‘Community Based Mine Risk Reduction’ (CBMRR) teams fielded by CMAC with assistance from Handicap International (HI)²⁷. Whilst this approach does not necessarily provide any particular improvement in *efficiency* (it uses the same manual clearance processes used by other demining teams) it does offer an improvement in *effectiveness* as it allows direct targeting of the resources to solve problems in the task area, including timely removal of UXO as soon as it is reported and clearance of small, vital areas (such as water sources) combined with marking of safe routes. The wider use of CBMRR teams is strongly recommended.

MAG is experimenting with the use of local people in ‘proximity demining’ projects which is an interesting bridge between conventional demining and informal demining. Under this approach, MAG will be able to significantly reduce cash spent on salaries and accommodation, and, furthermore, these salaries will be targeted at the local villagers, so giving the proximity demining project additional value as a rural income generation activity.

HALO Trust is the leader in the development of the One-Man, One-Lane (OMOL) technique, which is a way to significantly increase the productivity of individual deminers. It is noted that MAG have now adopted this technique and CMAC are encouraged to follow suit.²⁸

There are some developments that may be less effective. For example, convention is that deminers clear lanes of one metre width. The Team understands that a wider lane width is being considered for use in Cambodia: this can have problems as a result of the ergonomics of detector use, particularly at the edge of the lane, where the detector is

²⁷ The concept was originally developed by the Mines Advisory Group (MAG) in 1999.

²⁸ It should be noted that not all metal detectors are ergonomically suitable for OMOL. This should be taken into account in selection of future equipment.

swung in a noticeable arc. Mines at the extreme edge of a wide lane can be missed, though this problem varies with type of detector²⁹.

Mechanical demining

Although the mine action sector habitually uses the phrase ‘mechanical demining’ it is often more accurate to talk about mechanically-assisted demining as it is rarely possible for machines to achieve 100% clearance³⁰. When machines are used to prepare ground for manual deminers, it is their ability to safely increase the cost-effectiveness of manual demining that is their most significant attribute. This ground preparation is most important in the Cambodian demining context in terms of their ability to remove vegetation, though they can have a useful role in removing metal fragmentation if they are fitted with suitable magnets.

There are, however, a number of pitfalls in selecting machines. MAG and HALO are familiar with these issues and are able to select the equipment that is most suitable for their activities. CMAC has free donations of Japanese equipment but this is a two-edged sword: the donations ease CMAC’s financial requirements but they restrict CMAC’s ability to choose the equipment. Furthermore, there are some doubts that the equipment is the most cost-effective available on the market. For example, smaller teams need access to smaller equipment or else the equipment wastes valuable working time either sitting idle on one site or traveling between work sites. Such equipment is available in Cambodia in the form of the locally-produced TEMPEST device and it is recommended that CMAC consider the use of TEMPEST (or similar sized devices) in support of their smaller CBMRR teams in concert with their larger machines.

Mine Detecting Dogs

Mine Detecting Dogs (MDD) are in use in Cambodia as a result of a significant investment by the Swedish International Development Agency (SIDA). Originally established within CMAC by the Swedish Armed Forces, the project is now managed with technical assistance from Norwegian People’s Aid (NPA). The program has taken a long time to become effective and there have been lingering reports about problems with the management of the dog teams, though the Permanent Advisory Team provided by GICHD report that these problems are in the past. There is, however, as yet no quantitative measurement of the ability of the dogs to enhance cost effectiveness of demining by CMAC, though GICHD have undertaken to carry out such a study.

Area Reduction

Area Reduction is the term for a process by which a suspected mined area with vague undefined boundaries is reduced to a smaller area containing the actual contamination, with the outer areas then being released for use without further clearance activity. Unfortunately, at present this is more of an aspiration than a valid technique, and it is also a subject where IMAS provide little guidance on how area reduction should be done. In

²⁹ A useful technical handbook on this subject is available from the EC Joint Research Centre at Ispra, Italy

³⁰ One exception to this is where machines are used to excavate and remove soil containing mines, which can be particularly suitable for clearing roads.

principle, Cambodia has access to a potential area reduction technique through the combined use of vegetation clearance machines and dogs, and this is probably the most cost-effective use of dogs.

There are also reports that CMAC is considering the re-introduction of an older, discredited technique that involves manual deminers entering a suspected area at regular intervals (15 metres) and then using the lanes produced by these deminers to establish the boundaries of mined areas. Frankly, there is no need to re-trial this technique: it does not work (and it has been proved not to work), as it can miss entire minefields where these are laid in a non-patterned manner, such as that employed by the Khmer Rouge.

Level Two and Technical Survey

There are related problems with the terms ‘Level Two Survey’ and ‘Technical Survey’. Again, there is no single agreed definition for either terms³¹ and both have been used interchangeably to describe all of the following:

- More detailed investigation of the impact of the contamination, using a combination of Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) techniques. However, it is difficult to see how a mass re-survey could add value to the existing Level One Survey (L1S) as it is essentially the same technique used in the original L1S. Such survey work can be done on a site-by-site basis as part of the task planning process (and is already included in the task assessment phase of the CBMRR approach).
- Technical investigation of the minefield to establish the nature of the contamination. This is a common technique though frankly it is difficult to understand how it adds value in low-density mined areas.
- Establishment of the boundaries of the area for subsequent clearance, including preparation of a baseline for clearance teams. Again, whilst this is a useful function it is difficult to see why this cannot continue to be done on a site-by-site basis (as carried out by HALO and MAG at present). There is also a risk that this process (which does not include area reduction) could be misinterpreted as having ‘cleared’ the original suspect contaminated area and be reported accordingly.

In short, the Team is not persuaded of the need for a comprehensive National Level 2 or Technical Survey.

Negative Confirmation

There may be some opportunity for the use of dogs and/or machines in the concept of ‘negative confirmation’ whereby the dogs/machines are used to check an area that is ‘probably clear (see Chapter 6 on Standards). This could have a role in risk reduction for risk-averse agencies conducting development projects – however it may be argued that in general, if the land does not present a problem for the local community, mine action assets would still be better utilised to clear areas where they do have a problem (i.e. probably or definitely mined areas). Furthermore, there is still little common understanding of the

³¹ Both have also been used to describe the area reduction by lane probing method described above.

concept of negative confirmation in the international mine action sector and this is an area where more research is required.

Quality Assurance/Quality Control (QA/QC)

QA/QC is a vital component of mine action as it is the main way in which donors can be sure that mine action implementing agencies are ‘doing the job right’. The Team finds that there is only a patchy and sporadic provision of quality management services in Cambodia. This varies from the comprehensive QA/QC cover provided under the CMAC Demining Unit 3 Project in Pailin, to an almost complete lack of external QA/QC cover in CMAC DU2, 4 and 5, HALO Trust and MAG. To be comprehensive, technical QA/QC must be carried out by technically qualified and independent personnel, and must be linked with conventional financial audits.

New technologies

The history of mine action is littered with the remnants of promises of new technology that have failed to deliver the advances that they have claimed. There are few new technologies on the horizon that have the potential to provide genuine improvements. The one notable exception is the concept of a dual-sensor mine detector that includes a combination of metal detector and a new ground-penetrating radar. This offers the potential for deminers to ignore the large number of metal fragments that generate false alarms and can each take around 15 minutes to investigate³². However, these detectors are still in development and there has been no analysis of their impact on cost-effectiveness

Explosive Ordnance Disposal

There is little to say at a strategic level about techniques used in EOD in Cambodia. One area that does deserve comment, however, is the recent introduction of Improvised Explosive Device Disposal (IEDD) training in CMAC. IEDD techniques have no place in teams intended to conduct conventional munition disposal techniques against unexploded ordnance (UXO), as IEDD techniques are intended for use against locally-fabricated devices used by criminals and terrorists. It is true that CMAC periodically receive calls to assist with IEDD tasks on behalf of the security forces in Cambodia, and it is clearly better for the safety of the teams for them to have training than for them not to have training. However, this can only be a short-term fix as the provision of an IEDD capacity in CMAC has the following significant, structural problems:

- CMAC is not mandated to carry out security activities³³
- CMAC EOD teams are funded by donors to carry out humanitarian activities and their use on IEDD tasks may be deflecting their work elsewhere
- Provision of IEDD response by CMAC blurs the roles of humanitarian and security agencies

³² Presentation by Cyterra Inc on the HSTAMIDS mine detector at the 2004 EUEM conference, Brussels September 2004.

³³ As explained by General Ouk Kim Lek of the Royal Cambodian Police

- CMAC is unlikely to be a sustainable home for IEDD activities as it is almost wholly dependent on external funding

Whilst it is recognized that there is a short term urgent shortfall in IEDD capacity in Cambodia, which may be easiest resolved by use of CMAC resources in the immediate term, it is strongly recommended that a more sustainable IEDD capacity be developed within Cambodian security forces, such as the Police.

There is one non-technical observation about EOD activity, as raised in the workshop on Tampering held at MEDICAM on 2 December 2004. This is that, where EOD teams take away the scrap metal remnants of items of UXO that they have cleared, there is an economic disincentive for the poorer parts of Cambodian society to report UXO if there is a market for such scrap. A simple change in organizational procedures to direct EOD teams to leave the scrap behind for the villagers would solve this problem.

One related set of techniques that has been traditionally kept separate from EOD agencies in Cambodia is the set of techniques used in ‘Small Arms and Light Weapon Reduction’ (SALW). Theoretically a set of techniques to destroy small arms (and thus technically not an EOD problem) in practice SALW practitioners are often presented with items of ammunition (and even UXO) and must therefore have access to an EOD capability. There may be some scope in bringing SALW techniques under qualified EOD supervision in the future.

Mine Risk Education (MRE)

As mentioned in the chapter on scoping, there is little quantitative evidence on the efficacy of MRE activities in Cambodia. There are, in essence, three possible MRE interventions:

- Community based MRE presentations
- Schools based MRE presentations
- Mass media MRE ‘spots’

It is the opinion of the Team that only the first of these should really be considered as the business of mine action implementation agencies. The other two are probably more appropriately mainstreamed within general public health “Information Education Communication” (IEC) activities, with mine action specialists providing technical advice on content, but not on message delivery techniques. Community based MRE presentations are also much more likely to be effective when combined with integrated mine action solutions (such as the CBMRR approach described above), where they can also help to link reports of mine and UXO with an immediate remediation response.

The one area of MRE that appears to be particularly under-represented in Cambodia is the lack of such training for expatriates working on general aid and development projects. Donors and aid program managers should be aware that the failure to provide such safety training is likely to be considered a failure of ‘duty of care’ and would doubtless result in

litigation in the event of a mine accident involving expatriate staff. There is therefore a need for provision of such services in Cambodia.

A series of recommendations for the implementation of mine action techniques are included below.

Recommendations

The following recommendations are made in respect of mine action techniques in Cambodia:

- Agencies should continue to investigate means to improve cost-effectiveness and efficiency of their services.
- The OMOL drill should be more widely adopted.
- The CBMRR approach should be more widely adopted.
- More work needs to be done on the integration of dogs and machines into demining activities.
- There is no case for a stand-alone ‘Technical Survey’, Level 2 Survey or Re-Survey of Cambodia.
- Work needs to be done on developing suitable techniques for area reduction.
- The program needs a comprehensive and coherent quality management capacity.
- Potential new technologies should be critically scrutinized in light of their true capacity to improve cost-effectiveness.
- A longer-term approach is needed for the provision of IEDD capacity in Cambodia.
- EOD teams should be organized so they not be seen as being in competition with scrap metal dealers
- MRE is best integrated into CBMRR or public health ICE activities.
- There is need for development agencies to have access to MRE training for new arrivals.