Beyond De-mining
Capacity building & socio-economic sequences
Edited by Gareth Elliot
BEYOND DE-MINING:
Capacity Building & Socio-Economic Consequences

Edited by
Gareth Elliot

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Editor's Note

This book is based on research conducted during the Landmines in Southern Africa project at the South African Institute of International Affairs (SAIIA). The Landmines in Southern Africa project was established at the SAIIA in January 1997 to examine the consequences of landmine proliferation in the region. Since May 1999, with the support of the Finnish government, the project has researched and monitored developments in the region's mine clearance industry.

The Project aimed to fulfil the role of an impartial interlocutor facilitating relations between the southern African de-mining community, the landmine ban campaigners and other groups. Moreover, the Project aimed to provide research and debate on the pressing issues faced by the southern African de-mining community. The Project published a bi-monthly newsletter, De-mining Debate, on the progress and issues facing the southern African mine clearance community.

During the project three salient issues were identified. First, better national mine action capacity building is needed in light of diminishing donor funding; second, the mine clearance operators must make the most of the de-mining toolbox; third, better task prioritisation is required to maximise the impact of mine clearance on affected communities.

Most of the chapters in this book are drawn from selected papers delivered at the conference entitled The Road Forward: Humanitarian Mine Clearance in Southern Africa staged at the SAIIA on 7–8 June 2000. The conference's objective was to highlight both the technical aspects of de-mining and development implications. The conference assembled experts from as far afield as Afghanistan, Angola, Cambodia, Mozambique, South Africa and Zimbabwe.

The project, conference and publications would not have possible without the generous financial assistance of the Finnish Government. Special thanks are made to Pekka Orpana (Embassy of Finland) and Ilka-Pekka Similiä (Finnish Department of International Development and Co-operation) for their kind assistance.

This book is a product of the valuable contributions of those who presented papers from Angola, Cambodia, Mozambique, Norway, South Africa, the United Kingdom, the United States and Zimbabwe. These people and the organisations they represent are at the forefront of mine clearance and mine action.

A special word of appreciation must go to those who took time out of their busy schedules to provide me with a better understanding of the dynamics, contradictions and challenges facing mine clearance in
southern Africa. I would especially like to thank Nico Bosman, Ananda Millard, Noel Stott, Gerhard Zank, Chris Pearce, Temba Kanganga, Filipe Muzima, Mike Wilson, Adérito Ismael, Derek Baxter, Artur Verissimo, the Mines Advisory Group and the numerous individuals at the United Nations Development Programme (UNDP) and the United Nations Mine Action Service (UNMAS).

Last but not least I would like to thank the Institute staff. Grateful thanks are made to Heather Thuymsma for her help in organising the conference. Thanks go also to Pippa Lange for her sometimes-laborious language editing and Andie Helman for her meticulous proof-reading, Anne Katz for laying out the manuscript, André Snyders for his helpful assistance, Elizabeth Sidiropoulos for her velvet glove oversight of the entire project and Greg Mills for recognising the need for such research and allowing me the independence to delve into the dynamics of the mine clearance industry. I would also like to thank my friends and family for their support and motivation during the production of this book.

Gareth Elliot
October 2000
The extent of the landmine scourge in our region is well known. The eradication of these mines must be seen as a priority if the region is to develop and prosper. However, mine removal also places the responsibility on us to find a means of preventing any subsequent use of these destructive weapons.

Mine clearance in southern Africa began following the resolution of various regional conflicts and struggles in the early 1990s. As we look back we have the benefit of hindsight, which may assist us towards a productive discussion on the road forward for humanitarian mine clearance in southern Africa.

The challenge we are confronted with in southern Africa was clearly stated by Mozambican President Joaquim Chissano in 1999. At the opening of the First Meeting of the State Parties of the Mine Ban Treaty, President Chissano said, 'Our success shall, in future, be judged in terms of fewer and fewer victims and the level of assistance we provide them, and also in terms of the extension of arable land and a degree of normalisation of life in the affected communities'.

We in South Africa are committed to working with our neighbours in dealing with the problems created by landmines. This is not only because of our obligations as a State Party, but because, from a foreign policy perspective, it is in South Africa's national interests to assist the mine-affected countries in our sub-region. South Africa's contribution to mine clearance in southern Africa is made through facilitating bilateral contracts within the context of the SADC Working Group on mine action.

After nearly eight years of concerted efforts to remove landmines, we need to look back and ask ourselves how our efforts have impacted on those in need, and what can be done to further intensify and accelerate our efforts to eradicate this scourge.

We should set a number of prioritised objectives in order to maximise the humanitarian impact of mine clearance. These objectives should be to:

• support the delivery of humanitarian assistance in contaminated areas where there is a high casualty rate;

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support the resettlement of refugees and internally displaced persons;

* support subsistence agriculture;

* support community-based development projects; and

* support reconstruction and development.

Furthermore, it is important to bear in mind that our mine action efforts should be aimed at assisting national governments to rebuild their communities. Our contributions should, therefore, be part of the overall development and the rehabilitation of affected countries.

As such, mine action is not only about mine clearance technology and equipment. The care, rehabilitation and social reinstalment of mine victims should also remain a priority. To achieve optimal efficiency in the long-term, a structured flow and analysis of information about affected communities and mine victims in the context of the mine problem in mine-affected countries is needed. This will assist in the allocation of scarce resources among mine clearance projects, community awareness programmes and provision for the health and social needs of landmine survivors.

We should not indulge in speculation on the number of landmines in our region as the mere suspicion of one landmine can cause a whole community to abandon its land. We should rather focus our discussions and actions on determining success through a reduction in the number of landmine victims and the resumption of normal community life in affected areas.

In conclusion, I believe that the clearance and elimination of all landmines in Africa is achievable. I have a vision of an African continent without war. The Mine Ban Treaty and the important contribution of organisations such as the South African Institute of International Affairs are signposts towards the concrete realisation of this vision of the abolition of war in Africa, and the coming of the African Renaissance.
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Contents

Editor’s Note v
Foreword vii
About the Contributors ix
Introduction
  Gareth Elliot and Greg Mills 1
The Emergence of a Complex Industry
  Gareth Elliot 9
National Co-ordination and Capacity
  Building of an Unsustainable Industry
  Leon Terblanche 31
The United Nations Mine Action Service
  UN Mine Action Service 37
The Role of the National Institute
  for De-mining in Mozambique
  Artur Verissimo 43
Mine Clearance in a War Zone
  Helder Cruz 53
Effective Expansion of the Toolbox:
  Lessons Learned in Southern Africa
  Gareth Elliot 61
Realistic Costing: When is it just too Cheap?
  Chris Pearce 71
Cost Benefit Analysis and Mine Clearance
  Geoff Harris 87
Using Socio-economic Indicators:
  Illustrations from Mozambique
  Ananda S Millard 99
Responding to Community Needs:  
The Mine Action Team Approach  
Steve Johnson  

Improving the Socio-economic  
Impact of Humanitarian Mine Action  
Sara Sekkenes  

The Concept of the Land Use Planning Unit:  
A Cambodian Perspective  
Oum Sang Onn  

Appendix: Landmine Ban Treaty  

Select Glossary  

Introduction
Gareth Elliot and Greg Mills

For too long Africa has been perceived as a problem to be solved, rather than a voice to be heard. It is seldom seen as a continent from which anything can be learned. But, in the area of mine clearance, it is a continent from which lessons can both be drawn and shared with other regions. This was observed time and again at a conference entitled The Road Forward: Humanitarian Mine Clearance in Southern Africa, funded by the Finnish government and held at the South African Institute of International Affairs (SAIIA) on 7–8 June 2000.

Landmines are a global problem, affecting 88 countries across four continents. Currently mine clearance is under way in 41 states, including Angola, Afghanistan, Bosnia, Cambodia, Croatia, Jordan, Laos, Mozambique, Somalia, Sri Lanka, Yugoslavia and Zimbabwe. According to the United Nations Mine Action Investment (MAI) Database, 13 donors spent US$272.5 million on mine clearance between 1993 and 1999. The major recipients include: Bosnia and Herzegovina (US$47.8 million), Afghanistan (US$38.2 million), Mozambique (US$28.8 million), Cambodia (US$28 million) and Angola (US$24.5 million). However, many donors do not register their funding levels on the UN database. Global mine clearance funding figures are therefore probably higher.

The Landmine Monitor 2000 estimates that between 1993 and 1999, at least US$800 million was spent on mine action (this term includes mine clearance, mine awareness, capacity building, advocacy and prevention, and victim assistance and rehabilitation). In 1999 alone, an

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4 These figures are, however, not totally representative of total humanitarian mine action funding. Funding for research and design into de-mining technology and equipment is not included in these figures; neither are bilateral in-kind donations (such as de-mining equipment, vehicles, training programmes, technical advisers, and so on).
estimated US$211 million was allocated by 17 donors to mine action.⁵ Despite the relatively recent emergence of mine action as a sector of humanitarian aid, today it is a global multimillion-dollar industry.

**From politics to progress**

In many ways, southern Africa has been at the forefront of global mine clearance developments. Following the peace agreements signed by Angola and Mozambique in the early 1990s, much international attention was focused on the urgent need to remove the debris of war so that the civilian population could rebuild their lives. Angola and Mozambique were regarded as 'two of the most heavily mined' countries in the world.

The UN has been closely involved in the creation and development of long-term national capacities within Angola and Mozambique. The de-mining non-governmental organisations (NGOs), Hazardous Life Area Support Organisation (HALO), Handicap International (HI), Mines Advisory Group (MAG), Norwegian People's Aid (NPA) and the innovative Menschen Gegen Minen (MGM) have helped create a safer environment for tens of thousands of communities in Angola and Mozambique. Southern African commercial mine clearance companies have also been drivers of technological and operational developments in international humanitarian mine clearance. Today some are regarded as world leaders in their respective de-mining core competencies.

Mine clearance in southern Africa, however, has had its problems. For much of the 1990s the focus of the southern African mine clearance community was diverted by myriad conflicts, allegations of corruption and general distrust among role players. These side-issues frustrated most de-miners, as they felt only 10% of their time was spent on clearing mines, while the remainder was occupied by the politics of de-mining.

The first *Landmines in Southern Africa* project at the SAIIA (1997/8) examined these issues and offered strategies for success.⁶ Four broad principles to follow were put forward:

- common sense;
- communication;
- clarity; and
- commitment.

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Beyond De-mining

Two years later, although much has changed, much has remained the same in southern Africa. Far too often common sense is replaced by self-interest, and commitment is nothing more than popular jargon. Notwithstanding these problems, the southern African mine clearance community has moved beyond most of the jealousies and pettiness to focus more attention on lifting landmines.

The conference The Road Forward: Humanitarian Mine Clearance in Southern Africa held at the SAIIA in mid-2000 allowed mine clearance role players to exchange lessons learnt during the last few years. Drawing together a diverse range of expertise from as far afield as Afghanistan and Cambodia, the conference made possible a survey of the whole spectrum of de-mining operations, from the political through the strategic to the operational. Within this more participatory context, role players began dealing with the most important issues that face the southern African region.

Three fundamental challenges were identified during the conference proceedings on which this volume is based. These concerned capacity building, the finite nature of de-mining activities, and the need for integrated planning.

Capacity building

Southern Africa’s national mine action centres currently lack the capacity to perform their mandated functions effectively. This poses a major challenge to the success of future mine clearance operations in the region.

Southern Africa needs efficient and effective national mine action centres if the landmine problem is to be solved. As one conference participant noted, ‘management and supervision are the most important elements of mine clearance operations’. Indigenous mine action capacities are crucial for the long-term sustainability of efforts to reduce the risk of landmines.

Many lessons have been learnt since 1993. Chapters 3 and 4 outline the new perspectives on capacity building and assistance to mine-affected countries of the United Nations Development Programme (UNDP) and United Nations Mine Action Service (UNMAS) respectively.

Similarly, in Chapters 5 and 6, the national directors of the Angolan Instituto Nacional de Remoção de Obstáculos e Engenhos Explosivos and the Mozambican Instituto Nacional de Desminagem (IND) outline their new approaches to, and strategies for, mine action in their respective countries.

The conference highlighted the divergence of views on the process of capacity building. There is no single approach to the construction of capable national mine action centres in every country, as painful
experience has shown. However, capacity can be built by the use of a twofold strategy: creating a sense of commitment and ownership.

First, all stakeholders need to understand the nature of the problem, project or technical assistance requirement. Capacity building cannot be a top-down exercise from New York. The inclusion of as many role players as possible in the process will lead to less resistance and ultimately more commitment to the process of developing an indigenous de-mining capability. At the conference a leading Mozambican mine action official implored the UN to include nationals in the decision-making process because, after all, it is their country that is afflicted, and they will be ultimately responsible for the clearance of landmines.

Second, ownership of the process is a natural progression from greater role player commitment. The greater the involvement of all role players, the less likely the resistance to change. It is only natural for people to resist change if they are unaware of, or do not understand the aim of the process. A more inclusive and participatory environment makes role players more accountable, as invariably there will be fewer obstacles, imagined or real, to developing workable strategies and action plans to deal with the issue at hand.

The objective of building national capacities should not, however, overshadow the principal aim of humanitarian mine action — reduction of the risk and human suffering caused by landmines. The primary task remains the clearing of landmines. As Chris Horwood points out in his paper ‘Humanitarian Mine Action: The First Decade of a New Sector in Humanitarian Aid’, the development of an indigenous capacity should be kept in perspective and balanced with the immediate and finite goals of humanitarian mine action.7

In southern Africa one too often feels that development of national mine action centres has become the primary objective of most de-mining activities. The de-mining community must ask itself whether it is necessary to build national mine clearance institutions for a problem that is in essence diminishing.

**A growth industry?**

Mine clearance is, by definition, not a growth industry. Indeed, ultimately the success of de-mining initiatives will be measured by the length of time it takes for the de-miners to work themselves out of a job. The global humanitarian mine clearance industry commenced in the late 1980s with the withdrawal of Soviet forces from Afghanistan. The industry will endure — new conflicts notwithstanding — until 2015 at

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the outside.

Also, donor funding is not infinite. Donor fatigue is setting in and some analysts foresee mine clearance funding remaining at current levels for no longer than five to seven years. Likewise, political interest and media attention will continue to divert funds to certain areas (such as Kosovo), while many others with more severe landmine threats (such as Chechnya, Ethiopia and Eritrea) receive little or no attention.

Paradoxically, the decline and the bias in donor funding come at a time when the scope of the global landmine problem can be estimated realistically — that is, when the problem is within sight of solution. For the first time since the start of humanitarian mine clearance, estimates have been given of manageable and finite numbers of landmines strewn across the globe. The landmine problem can be solved in years rather than centuries, as was once estimated.

In 1993 the UN estimated that between 80 and 120 million landmines had been laid throughout the world. At the time the UN was still coming to grips with the landmine problem, and few international best practices existed. The international media quickly seized the opportunity to report on the highly sensational, but poorly supported statistics of more than 100 million landmines throughout the world. Mine-affected governments soon realised it was in their interests to publish the ‘worst case scenario’ statistics and estimates to the international community to encourage increased donor funding. Other interests are also believed to have motivated the inflation of the estimates. The International Campaign to Ban Landmines (ICBL) was accused by some of ‘hijacking’ the mine clearance issue and diverting resources away from mine clearance, by persuading potential donors that clearance presented an open-ended, insurmountable problem.

Notwithstanding the motives behind the inflation of the statistics, field experience has shown the official figures to be gross exaggerations. For instance, the HALO Trust found massive discrepancies between the numbers in the UN estimates and their own records of landmines laid.

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8 Comments made by speakers and participants at the conference ‘The Road Forward: Humanitarian Mine Clearance in Southern Africa’ held at the SAILA, Jan Smuts House, 7–8 June 2000.

9 Horwood C, op. cit., p.32.


cleared, and areas made safe. In Angola official estimates place the number of landmines at between nine and 15 million. HALO has been actively involved in the clearance of the 'most affected' Angolan province of Bie, and by early 1999 had cleared 17% of the suspected highly contaminated areas, to find only 2,036 mines. Extrapolating the figures from the most heavily mined areas to include the entire country provides a figure of fewer than 500,000 landmines (477,756). Various other statistical manipulations of the HALO data provide other figures; all below one million.

Based on current clearance rates, high priority areas in the world can be cleared in the next five to 10 years in most countries. For once, realistic time frames for the solution to the landmine problem can be given.

We are now presented with a window of opportunity. Despite the finite resources and limited time frame, southern Africa’s landmine problem is manageable. Maximum use of the resources available will not only benefit the affected communities, but may assist in the reversal of donor fatigue as successes become evident. Expanding the mine clearance toolbox will undoubtedly increase the productivity and efficiency of mine clearance and their positive spin-off effects for communities. Improved identification and prioritisation of the most affected communities are also important challenges facing the southern African mine clearance industry.

Co-ordination and planning

There is an imperative for co-ordination and planning to ensure the most cost-effective and efficient use of increasingly limited funding. This need was seen as being satisfied by two measures: expansion of the toolbox concept and priority setting; and the adoption of a holistic approach to de-mining.

First, the management of the 'toolbox' poses one of the biggest challenges to mine clearance role players (see Chapter 7). Without sound planning and identification of the problem at hand, machines and dogs may in many instances hinder mine clearance and increase the costs of de-mining. Put simply, mine clearance operators have to use their tools in the most appropriate conditions.

Mine clearance methods need to be mixed and matched according to the circumstances. Currently, three basic mine clearance techniques exist: mine-detecting dogs (MDDs), mechanical tools (such as modified bulldozers and tractors, flails, steel-wheeled vehicles, and so on), and

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13 Bottiglieri, op. cit., p.55.
manual means. The challenge is to find the most efficient and cost-effective combination of these technologies, while continuing to maintain the strict safety standards of humanitarian mine clearance. Each technology has its limits — there is no silver bullet solution to lifting landmines. An integrated approach is needed to address the multidimensional challenge landmines pose to mine clearance practitioners.

Second, the massively downscaled estimates of the number of landmines should not divert one’s attention from the real impact of landmines. There is no direct relationship between the number of landmines in the ground and the effect they have on individuals, households, communities and countries. The impact of landmines cannot be measured merely by the number of landmines, or the time and costs needed to remove all mines: it is more complex and multifaceted.

A well documented example of the ‘numbers issue’ occurred in Mozambique. A village had been abandoned by 10,000 people due to alleged mine infestation. After three months of clearance by the NPA, only four mines had been found. On the other hand, high-density minefields along the north-eastern Zimbabwean border have limited impact on local communities.

Identification of the impact of landmines requires improved understanding of the communities affected. The last four chapters of this volume offer approaches to identifying and understanding this aspect. Traditional impact assessments have focused on the macro and meso level implications of landmines. The contributors to this volume have focused more on the meso and micro level impacts. Each author offers a different approach to understanding communities and their needs, yet the basic tenet of each is the realisation that a mine clearance operation is not just a tool, but also a partner in the development of mine-affected countries.

If better co-ordination and planning is to be achieved, mine clearance will have to be more closely integrated with the broader community’s requirements. Most role players recognise the need to adopt a more holistic approach. The time has come to integrate development expertise actively and concertedly into humanitarian mine clearance. This does not mean that development-focused personnel should replace traditional mine clearance actors. Both are needed, and should be utilised in a complementary way.

De-mining NGOs need to forge strategic partnerships with development organisations. A positive example in this regard is the MAG in Cambodia, which has successfully operated in conjunction with

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several development agencies. Nothing is preventing commercial companies from following suit and implementing similar arrangements. A good example is the partnership between Mine-Tech and a German development agency, GTZ, for specific development-oriented contracts.

It is important to remember, though, that integrating humanitarian mine clearance with development cannot be regarded as a one-way process, where mine clearance operators make all the adjustments. For the mine clearance and the development sectors to build a meaningful partnership, the development community also needs to re-evaluate and adjust its prioritisation and planning processes.

Looking forward

The southern African mine clearance industry needs to make the most of the window of opportunity. Landmines will continue to be found in southern Africa for decades to come, just as European countries still find landmines and unexploded ordnance from the two world wars. What is of importance is the removal of those landmines that have the greatest impact on communities, in the most efficient and cost-effective manner.

All stakeholders, whether from mine clearance or the development community, need to be open and receptive to new technologies, techniques and ideas (and at times to experiment with innovative solutions). The key is to have an approach characterised by the inclusion of all actors. Only in such a way can the complex process of mine clearance be fast-forwarded.

Developments in the de-mining community in the last two years indicate that there is significant scope towards more integrative approaches to mine action, from the pooling of resources, skills and information on the one hand, to horizontal co-ordination of stakeholder activities on the other.

Southern Africa does not have a landmine problem, it has a development problem. Landmines are not the cause of the region’s underdevelopment, but they certainly compound it.
The Emergence of a Complex Industry

Gareth Elliot

The end of the Cold War brought many changes to the structural dynamics of the international political system. One result of the warming of relations between the United States and Gorbachev's Soviet Union in the late 1980s was the cessation of numerous proxy wars that had been waged throughout the developing world. The thaw in relations also opened the way for the United Nations (UN) finally to play the role foreseen in its Charter when it was drawn up after the Second World War.

The UN's new role is most clearly illustrated in the deployment of UN forces between 1988 and 1993. In this period the UN became involved in Afghanistan, along the Iran-Iraq border, Namibia, Angola and Central America, after a ten-year break in UN peacekeeping operations. These operations marked the re-emergence of peacekeeping and afforded the UN the opportunity to demonstrate its utility in war zones. The 1990s saw the height of UN peacekeeping operations, when more than 80,000 personnel were deployed around the world at the same time.

In contrast to the UN's understanding of the traditional ambit of peacekeeping, the peacekeeping operations of the 1990s extended the scope of action to include verification of troop withdrawal, the organisation and observation of elections, and assessment of the provision or denial of human rights. Another key function was mine clearance in former combat zones. Because the vast majority of armed struggles since the Second World War had been internal, in many of these conflicts landmines were extensively used to deny combatants and civilians access to vital infrastructure and resources. Mine clearance was often necessary to provide a secure environment for peacekeeping and to allow UN agencies to carry out their secondary mandates (such as refugee repatriation, food distribution and so on).

The changing global power structure also resulted in the introduction of the concept of human security. Moving beyond the traditional

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military-based understanding of the meaning of the word, human security includes: safety from chronic threats (such as hunger, disease and repression) and protection from sudden and hurtful disruptions in the patterns of daily life. The indiscriminate use of landmines in most conflicts challenged the human security of thousands of people long after the guns had fallen silent. Therefore, for the UN and the international community to create an environment conducive to human security, the threat of landmines needed to be quantified and addressed in conflict-torn and post-conflict countries.

Governments remained largely unaware of the extent of the landmine epidemic until the end of the Cold War. In 1988 a small non-governmental organisation (NGO), Hazardous Area Life Support Operation (HALO), introduced the concept of humanitarian mine clearance in Afghanistan. A year later the UN established the first and longest-running country mine action programme.

In 1992 growing international concern at the humanitarian costs exacted by landmines led a group of NGOs to initiate a political strategy to ban the use, stockpiling, production and transfer of landmines. The birth of the International Campaign to Ban Landmines (ICBL) paved the way for a remarkable multilateral achievement backed by international civil society and a group of core states. Developed and agreed upon in just one year, the Mine Ban Treaty was signed by 122 states in December 1997, and entered into binding international law in March 1999. UN Secretary-General Kofi Annan hailed the Treaty as 'a landmark step in the history of disarmament' and 'a historic victory for the weak and vulnerable of our world'.

Banning the use of mines is only half the problem solved, as 88 countries continue to grapple with the effects of landmines and unexploded ordnance (UXOs). By 2000, humanitarian mine clearance has been and continues to be conducted in 71 mine-affected countries. This chapter assesses the evolution of humanitarian mine clearance from its small beginnings in 1988 to the hundred-million-dollar industry it is today.

Four types of agency conduct mine clearance: the UN, NGOs, commercial companies and national governments (military). This chapter focuses on the first three categories, as they have directly

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shaped the evolution of the global humanitarian mine clearance industry. Before these actors can be assessed, however, two factors must be kept in mind. First, over the last decade, the concept of mine clearance has evolved as the role players have increased their understanding of the problem that landmines pose for post-conflict countries. This can be clearly traced in the terms and language used at the beginning of the decade to describe mine clearance as opposed to the much more sophisticated terminology now used, given the realisation that mine clearance actually requires a multi-dimensional approach. Second, mine clearance faces the same paradox that other humanitarian aid-related activities do. In essence, efficient mine clearance should aim to make itself redundant. However, where does this leave an industry worth over US$200 million in 1999?

**Evolution of language**

To trace the development in humanitarian mine clearance it is instructive to look at the evolution of the language used to describe mine clearance.

The concept of mine clearance has evolved over the last decade in accordance with increased cognisance of the problem in hand. Using traditional military breaching techniques in post-conflict countries was quickly seen to be ineffective. Instead, the humanitarian costs exacted by landmines and UXOs forced the UN and NGOs to adopt a more holistic approach to mine clearance. This approach to mine clearance is set apart by its principal objective — to expedite the safe return of land and other productive resources to civilian use.\(^6\)

**Military breaching**

Prior to the 1988 humanitarian intervention in Afghanistan, mine clearance typically involved military minefield breaching. Based on traditional military doctrines, breaching involves the creation of a path through a minefield as quickly as possible to allow the passage of troops and vehicles. Paths are generally created in one of two ways. First, mechanical methods such as ploughs, rollers or flails detonate the mines or push them aside, and second, long linear explosive charges detonate

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Military doctrine generally accepts a clearance rate of above 80%, sacrificing safety for speed. This form of mine clearance is, however, for the most part ineffective in post-conflict countries, as its objective is not to ensure safe living environments for communities, but to allow the safe passage of military personnel and vehicles.

**Humanitarian mine clearance and mine action**

The UN and NGOs' involvement in mine clearance since the late 1980s has led to a new concept: humanitarian mine action. This includes all activities geared towards addressing communities' landmine-related problems. The evolution of the language reflects the continual improvement in understanding of the problems facing mine-affected communities and countries. ‘Humanitarian’ mine action designates an integrated and holistic approach encompassing four complementary components:

1. mine awareness and risk education;
2. minefield survey, mapping, marking and clearance;
3. victim assistance, including rehabilitation and reintegration; and
4. advocacy to stigmatise the use of landmines and support a total ban on anti-personnel landmines.

In contrast to military breaching, humanitarian mine clearance aims to remove all explosive objects from an area, including anti-vehicle and anti-tank landmines and UXOs. Humanitarian mine clearance focuses on the removal of landmines and UXOs that threaten lives and deny local populations access to agricultural land and vital infrastructure. Such mine clearance often occurs in close proximity to local community settlements and the areas are large and seldom delineated in advance.

Humanitarian mine clearance relies heavily on manual de-miners with metal detectors and prodders. Mechanical methods are often employed, but in a role supportive of manual de-miners. This is known as mechanically assisted mine clearance (see Chapter 7). Dogs trained to detect explosives are also widely used in area reduction roles, to indicate the general location of landmines.

To achieve humanitarian standards the UN requires a clearance rate of at least 99.6%. This arbitrary figure is unacceptable to most

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humanitarian operators, as it is unthinkable to leave even four landmines out of a thousand in the ground. To the communities involved, the matter is even more serious. Without complete confidence, communities will not use cleared ground, so these areas will remain no-go areas. Humanitarian operators pride themselves on the strictest clearance rates and sometimes walk over cleared areas in front of the local inhabitants to prove that the land is now safe.

Humanitarian mine action also aims to create indigenous or local capacity in mine-affected countries, and thus assist in the country’s long-term rehabilitation and development. The UN is at the forefront of establishing national capacities, while NGOs have successfully indigenised most of their programmes in host countries (such as Afghanistan, Cambodia and Mozambique).

At a meeting in Bad Honnef, Germany (June 1997), NGOs involved in mine action programmes called for the inclusion of a framework for mine action along three central pillars:

- real participation by the people immediately affected;
- integration into comprehensive national reconstruction and development programmes; and
- implementation of humanitarian mine action to promote indigenous autonomy rather than create new dependencies.

This meeting highlighted the need for an integrated approach guided by development-based principles. The framework agreed became known as the ‘Bad Honnef Guidelines’. This development approach coincided with the change in the understanding among mine action stakeholders (governments, donors, NGOs and so on) of the impact of landmines on communities. Experience had shown that the number of landmines is not the sole indicator of their impact and that a broader approach was needed to deal with the problem.

The language of mine action has evolved further, and currently focuses on community impact assessments. This approach is different because it follows a bottom-up approach, using community participation in assessment and decision-making processes. These assessments move beyond consideration of the traditional macro and micro impact (such as power lines or access to water) to highlight the less evident issues that will determine the overall impact of de-mining (see Chapter 10).

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9 Guidelines for Mine Action Programs from a development-oriented point of view. Revised version integrating proposals made at the International NGO-Symposium from Bad Honnef, June 1997.
Humanitarian assistance and job security

The necessary clearance of the debris of war creates a paradox, however. An industry has been created to remove landmines and UXOs. In 1999, this industry received more than US$200 million in funding, which brought the total amount spent on mine action since 1993 to US$800 million. Moreover, it directly and indirectly employs many thousands of people in developed and developing countries. Yet, with the reduction of the threat of landmines to communities (primarily through mine clearance and to a lesser extent mine awareness and minefield marking), the problem is diminishing. In other words the faster the threat of landmines is removed, the nearer the problem is to being solved and the less money there is to be earned in the industry.

The humanitarian mine clearance community and specifically the UN is sometimes accused of being distracted from the primary motive of mine action: reducing the threats and obstacles to socio-economic development. For example, there are several mine action conferences or symposia virtually every month throughout the world. These expensive meetings very rarely lead to significant improvements in the productivity and cost-efficiency of mine clearance, and they divert much-needed resources and attention from the objective at hand.

Some believe the diversion of resources and attention away from the primary objective is a means of attaining job security for those in the mine action industry. This highlights a noticeable division between mine clearance operators and other agents of mine action (especially advocacy groups).

In most cases mine action organisations are not deliberately ensuring a form of job security. Such a claim would be offensive to the majority of mine action personnel, who put their lives at risk to assist vulnerable communities to create a safer living environment. However, mine action role players sometimes refuse to accept that landmines present a finite and manageable problem that can be addressed and solved in years rather than decades. When exit strategies should be on the agendas of most mine action organisations, few have even considered the possibility. HALO Trust is one organisation with a realistic and pragmatic understanding of the landmine problem. In Mozambique it is re-surveying the four northern provinces to assess what role it can play in the future of the country. In Zambezia province HALO Trust has

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11 Author's interviews with stakeholders throughout his tenure as Landmines in Southern Africa Researcher and comments made by individuals on the International De-mining Network, hosted by Menschen Gegen Minen (MGM).
shifted its focus to district level mine problems, as the provincial problems have been addressed. Prioritisation of mine clearance is decided upon in conjunction with the provincial authorities and is known as the District De-mining Initiative. The initiative will be replaced by a Provincial De-mining Fire Brigade (PDFB). HALO hopes to leave the PDFB as a highly flexible mine clearance unit, which will provide a basis for a truly sustainable capacity to respond to residual mine problems in Zambezia. HALO views this as a realistic exit strategy. This approach is unique in southern Africa.

The next section focuses on the roles played by the UN, NGOs and commercial operators in the emergence of the mine action industry.

**UN involvement in mine action**

The optimism felt by the UN at the end of the Cold War did not prepare the organisation for the challenges it faced in the 1990s. The body was ill-equipped for its new peacekeeping roles in a changing international environment. While traditional peacekeeping principles were dominated by Cold War *realpolitik*, the new international order, and the escalation in internal conflicts, demanded flexibility and creativity as sovereignty was reconceptualised.

The withdrawal of Soviet troops from Afghanistan and the subsequent signing of the Geneva Accords in April 1988 marked the beginning of a period many thought would bring peace and stability to that country. Initially the UN approached Afghanistan's landmine contamination from a military perspective. This was the first time a UN humanitarian programme had had to deal directly with the problem of landmines in order to meet the peace consolidation objectives.\(^\text{12}\)

Stark new realities faced the UN. The world's largest, and arguably *most influential*, organisation did not have the skills or the mandate to confront the landmine and UXO problem. In the absence of any mandated UN agency, the UN Office for the Co-ordination of Humanitarian Assistance to Afghanistan (UNOCHA) assumed responsibility for the initiation and co-ordination of a mine action programme.

UNOCHA developed a de-mining programme as part of its short-term national reconstruction plan, known as 'Operation Salam'.\(^\text{13}\) Initially the mine action approach responded to the need to clear areas of landmines.

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so as to make them safe for returning refugees. Teams of military specialists (such as engineers and explosive ordnance disposal experts) were sent from Australia, Canada, France, Italy, New Zealand, Norway, Turkey, the United States and the United Kingdom to train 15,000 returning refugees to de-mine their villages and lands for productive use.

This was the first time military techniques had been adopted for an indigenous de-mining programme. It soon became clear that this type of unsupervised or 'spontaneous' mine clearance was not effective because the quality of the de-mining was poor and the accident rate very high. It is estimated that 'hardly more than 500' trained returnees were employed in de-mining activities.\textsuperscript{14} However, this approach, although flawed by current standards, seemed to be a legitimate method of addressing a problem few understood at the time.

In 1990 a more structured, systematic and accountable response to Afghani mine clearance was initiated. The aim was to develop a structured long-term Afghan capacity to address the question of landmines. Four autonomous Afghan NGOs were established by UNOCHA to respond systematically to the landmine problem without being caught up in the UN bureaucratic procurement and recruitment regulations.\textsuperscript{15} The NGOs were contracted to conduct specific activities and the UNOCHA provided co-ordination, resource mobilisation and management to the overall programme. By mid-1990 approximately 900 de-miners (30 teams) were deployed in various Afghan regions.

Subsequently the UN initiated large mine clearance operations in Cambodia, Mozambique, Angola and Bosnia-Herzegovina as part of peacekeeping operations. During this period mine action focused primarily on mine clearance and, to a lesser extent, mine awareness. Only towards the end of the decade would other components of mine action (such as victim assistance) become regarded as equally important.

Mine action for much of the early 1990s was the part-time responsibility of various UN departments and agencies. Described by one commentator as 'an orphan with no parent agency able to take responsibility and deal competently with this demanding and awkward new issue', mine action within the UN system suffered a prolonged identity crisis.\textsuperscript{16}

In 1994 the newly established Department of Humanitarian Affairs

\textsuperscript{14} Eaton et. al., \textit{Afghanistan: The Development of Indigenous Mine Action Capacity}, p.12-13.

\textsuperscript{15} \textit{Ibid.}, p.13.

(DHA) became the first UN department given responsibility for mine action. Three years later the secretary-general, Kofi Annan, transferred the responsibility for mine action to the Department of Peacekeeping Operations (DPKO). In October 1997, as part of his broader reform programme, Annan established the United Nations Mine Action Service (UNMAS) within the DPKO. The agency is responsible for the strategic management and co-ordination of all UN activities in the area of humanitarian mine action, as well as peacekeeping de-mining (see Chapter 4).

The numbers game

From the start the UN focused on the presumed number of landmines throughout the world. While these figures undoubtedly provided the ICBL with much international exposure and contributed towards the signing of the Mine Ban Treaty, they inadvertently caused the UN to overestimate the magnitude of the landmine problem. During the early 1990s the UN estimated that more than 110 million landmines were deployed worldwide. At current funding and clearance rates it estimated that the costs of removing them would be US$33 billion, and that it would take almost 1,100 years to accomplish. The UN painted a picture of an insurmountable global problem based on these statistics. Only towards the end of the decade did it come to realise that the impact of landmines cannot be measured in statistics alone, if at all! The UN’s focus shifted to developmental issues, especially the effect landmines have on people’s lives, which brought about a more realistic understanding of the problem.

National mine action capacities

The Afghan experience highlighted the need for mine clearance and mine action activities beyond the scope of traditional peacekeeping operations. Mine action role players, the UN and NGOs, soon realised that the development of indigenous mine action capacities was central to long-term solutions to the landmine and UXO problems of most countries. These national capacities could provide a holistic approach to the various components of mine action.

Landmines and UXOs pose multidimensional problems for conflict and post-conflict countries. Apart from the casualty rate, landmines have a negative impact on the social and economic well-being of

communities in various ways. For example, they

- deny populations access to agricultural land;
- destroy livestock;
- reduce ability to generate income;
- restrict children’s access to schools;
- prohibit the repair and use of irrigation systems; and
- inhibit national reconstruction and development strategies.

The UN recognised the importance of establishing mine action capacities in the 1990s. Building on the Afghan experience, the UN has been intimately involved in the creation and support of indigenous institutions in Cambodia, Mozambique, Angola, northern Iraq, Bosnia-Herzegovina, Croatia and Kosovo. The United Nations Development Programme (UNDP) is also working with host governments to develop mine action capacities in Chad, Iran, Somalia, Sri Lanka, Tajikistan, Azerbaijan and Yemen.18

The national capacities, or mine action centres (MACs), are particularly important in countries with high landmine contamination as they provide the best hope of a long-term and sustainable solution. Efficient and effective MACs are essential in countries that need to co-ordinate numerous NGOs and commercial operators (such as Bosnia and Mozambique). Without central co-ordination, mine clearance is unlikely to complement the national development plans.

The MACs are required to go beyond simple de-mining and develop comprehensive strategies to deal with the social and economic implications of landmines. Some of these MACs fall under the broader UN umbrella. Examples are the United Nations Mine Action Programme for Afghanistan (MAPA), and the Bosnia and Herzegovina Mine Action Centre (BHMAC). Other MACs are incorporated into a host government department and are known under different names (such the National De-Mining Institute (IND) in Mozambique).

MACs are essentially one-stop institutions from which all mine action and related activities are planned, developed and co-ordinated. Some MACs have operational capacities (mine clearance, mine awareness and so on) and are not just co-ordinating institutions. The Cambodian Mine Action Centre is an example of such a MAC. In contrast, other MACs such as Mozambique’s IND have no operational capacity. In cases such as this, the UN may assist in the development of a separate institution to provide such capacity.

Initially technical advisers (TAs) are seconded from donor country militaries (often as in-kind donations) or are employed under direct UN

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18 Horwood, op. cit., p.17.
Office for Project Services (UNOPS) contracts to provide advice and technical assistance. TAs contracted to UNOPS or other international donor agencies are generally referred to as civilian TAs. This is a misnomer, as most civilian TAs, especially those used during the start-up stages of MACs, are retired military officers. Therefore, most TAs are serving or ex-military officers who adapt their military training for the benefit of humanitarian mine clearance.

TAs generally work in close collaboration with national counterparts, transferring skills and know-how. In most instances post-conflict societies lack the human resources to manage MACs effectively in the period following the cessation of hostilities. TAs also provide some degree of transparency to MACs, although most donors officially state that the presence of TAs does not influence their resource allocation decisions.

The UN’s involvement in the development of MACs has not been uniform. The varying nature of the peace agreements and post-conflict stability in affected countries may influence the UN’s ability to initiate the development of indigenous mine action capacities. This is best illustrated in the various co-ordination models found in countries such as Afghanistan and Croatia. For instance, in Afghanistan the UN has maintained strong control over mine action initiatives in the absence of a national government. On the other hand, the Croatian government plays a central role in the direction and co-ordination of its MAC.

Notwithstanding these differences, the UN (primarily the UNDP and to a lesser extent UNMAS) and MACs are most active in the following seven areas:¹⁹

- active involvement with host governments in the establishment and development of a national mine action capacity;
- development of national strategies and plans (within the broader national reconstruction and development plans);
- collection of mine data (such as size and location of affected areas, mine victims, and so on);
- mobilisation of funding and resources for national mine action;
- co-ordination of commercial and NGO agencies;
- testing and accreditation of mine clearance technologies according to international standards; and
- training and developing of indigenous staff in technical and non-technical positions.

The development of indigenous capacities is crucial for the long-term

¹⁹ Horwood, op. cit., p.17.
sustainability of the national mine action effort. The responsibility of removing landmines lies primarily with the affected state. Politically, mine clearance is a sovereign issue because the affected state must have ownership of the process. States are unlikely to accept foreign interventions, no matter how good donor intentions, without proper consultation and participation in the decision-making.

Indigenous capacities also make sense economically. TAs’ salaries generally range from US$60,000 to US$150,000 per annum, and these costs consume a large percentage of most MACs’ annual budgets. On the other hand salaries for nationals in equivalent roles are more than 50% less. Therefore, the faster technical and management skills are transferred to nationals, the fewer resources are spent on salaries and the greater the amounts that can be allocated to mine clearance.

Job security is an issue. Some commentators criticise civilian TAs for not making themselves redundant soon enough. Often these TAs are doers rather than teachers. This means that their national counterparts are sidelined in many roles and cannot learn the necessary skills. The consequent lack of national capacity is used to justify the continued presence of the TA. This scenario is not the rule, but often plays itself out in more nuanced ways in many MACs. Although this may be too altruistic a notion for many TAs to accept, the objective of all TAs should be to make themselves non-essential as soon as possible.

Typically the UN will reduce its involvement in a MAC once it has began to consolidate or reach a level of maturity where nationals run day-to-day operations. Determining when a MAC has developed sufficient capacity to function with reduced assistance or even without UN or other donor assistance has proven to be difficult. According to the UN, indigenous capacity is achieved when the,

indigenous entities have acquired the capacity to define and articulate overall policy and direction, to co-ordinate, and manage a programme that is capable of addressing the humanitarian implications of landmines, to generate and allocate resources in line with clearly defined priorities, and are able to ensure that the overall endeavour is accountable and undertaken in a cost-effective manner.

However, the UN’s theoretical criterion does not lend itself to easy quantification in practice. Experience over the last decade has shown that the vast majority of MACs have failed to acquire the capacity to define and articulate overall policy and direction. Instead, many MACs continue to rely upon TAs to provide the bulk of managerial and

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20 This criticism is not levelled at seconded military personnel, as they are employed by their own forces and have a job to go to when they return home.

21 Eaton, et. al., op cit., p.29.
financial administration.

**Mixed results**

The Afghan experience is most often cited as the best example of a mature MAC. MACA relies on fewer than five TAs, while more than 4,700 national staff are involved in mine action. Many believe the country’s relatively successful mine action programme is in large part due to the lack of a national government. Commentators believe this has allowed mine action practitioners to carry on with the business of clearing areas and conducting broader mine action with minimal political interference, albeit within a country still in conflict.\(^{22}\)

Similar success stories are harder to find. The mine action programmes in Angola and Mozambique have been racked by a range of problems and issues (some beyond the UN’s control).\(^{23}\)

In Angola and Mozambique the Instituto Nacional de Remaço de Obstáculos e Engenhos Explosivos and the Instituto Nacional de Desminagem (IND) respectively have yet to develop and effectively coordinate national strategies and plans for mine action. The UN failed to engage with either institution in a unified way. This was in large part due to initial decisions being made on an *ad hoc* basis. Also the UN’s cumbersome bureaucracy and lack of management structure and expertise prohibited it from acting decisively when problems demanded prompt solutions.\(^{24}\) Although many factors were beyond its control, the UN is partly responsible for failing to develop sustainable long-term national capacities in Angola and Mozambique.

Efforts are, however, under way to address these shortcomings in both countries (see Chapters 5 and 6). The success of these attempts will rest on whether the stakeholders can set personal and/or organisational interests aside and work together in the best interests of those affected.

The UN has performed a function within mine action that no other organisation could fulfil. Its international standing and its ability to mobilise resources and institutional capacity has helped provide mine action with increased publicity and resources. Some of its efforts have, however, been poorly executed. Some critics suggest that its

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\(^{22}\) Author’s observations and discussions with stakeholders between May 1999–September 2000.


\(^{24}\) Eaton, et. al., *op. cit.*, p.36-37.
preoccupation with the development of indigenous capacities has often detracted from mine clearance. Nonetheless, the organisation and its agencies and departments remain crucial actors in the development of mine clearance and action.

**NGO mine action actors**

While the post-Cold War international system provided the UN with a fresh role, it also opened a space for NGOs to play a more important part in global politics. The ICBL was at the vanguard of changing global perceptions because the ban forces states to change their policies regarding the use, production, stockpiling and transfer of landmines.

Notwithstanding this remarkable achievement, it is worth mentioning that a pioneering group of NGOs was involved in the clearance and destruction of landmines and UXOs long before the matter became an international issue. Since 1988 these organisations have been at the forefront of mine clearance. They are in many ways the unsung heroes of mine action, changing mine action in many ways through their creative field innovations and common sense approach to clearing landmines. The NGOs have taken the lead when bureaucratic problems and organisational inertia have hamstrung the UN in countries such as Afghanistan, northern Iraq, Cambodia, Mozambique and Laos. Moreover, NGOs implemented integrated mine clearance approaches (and mine awareness and community-based priorities) long before such considerations became part of mine action language.

NGOs have generally 'nationalised' their operations. For example, in 1993 the Norwegian People's Aid in Mozambique had 33 TAs in field and programme management levels. Currently the organisation is led by nationals and supported by five expatriates in advisory positions. In general, NGOs have transferred competence and responsibilities successfully from expatriate TAs to national staff in both field and managerial positions.

Four NGOs dominated mine action in the 1990s: HALO Trust, Mines Advisory Group (MAG), Norwegian People's Aid (NPA) and Handicap International (HI). Another NGO, Menschen Gegen Minen (MGM), has emerged in the late 1990s to become a very influential actor. The combined staff of these five organisations is estimated to be

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27 Filipe Muzima, email correspondence with author, 20 July 2000.
approximately 6,300.\textsuperscript{28}

Three of these NGOs have been at the forefront of the global stigmatisation of anti-personnel landmines. MAG, NPA and HI are co-founders of the ICBL and co-laureates of the 1997 Nobel Peace Prize. Ironically, HALO Trust, an organisation that generally shuns public attention, probably received more publicity from the famous walk taken by the Princess of Wales through an Angolan minefield with members of the organisation than many of the more publicity-friendly NGOs.

NGOs have the ability to initiate operations quickly, without many bureaucratic delays. HALO Trust is probably the best example of rapid deployment in war zones and/or post-conflict areas, where few other humanitarian assistance NGOs venture. This flexibility and ability to respond speedily creates an important distinction between NGOs and the operation of UN-sponsored and commercial companies. NGOs play vital emergency relief roles in the period before other actors can enter a country, and therefore have considerable impact in serious humanitarian emergencies.

The freedom from institutional constraints enjoyed by NGOs is illustrated in their approach to the number of landmines cleared. They were the first role players to move beyond the numbers issue and to interpret the landmine problem in terms of socio-economic impact. Organisations such as MAG, NPA and HI respond directly to the needs of communities, using multi-skilled and flexible teams. The community focus of NGOs is reflected in their prioritisation and planning processes; they rarely work on large infrastructure and long-term development clearance projects.

\textsuperscript{28} Ibid.
### Table 1: Information regarding various NGOs

<table>
<thead>
<tr>
<th>Name</th>
<th>Date established</th>
<th>Programmes*</th>
<th>Methodologies and approaches</th>
</tr>
</thead>
</table>
| HALO Trust | 1988             | Abkhazia, Afghanistan, Angola, Cambodia, Chechnya, Lao PDR, Mozambique, Nagorno Karabakh, Somaliland, Sudan. | • mechanically assisted manual mine clearance (MAM)  
• specific focus on removing landmines and UXOs  
• technical innovator  
• limited community development |
| MAG        | 1992             | Angola, Cambodia, Kosovo, Lao PDR, northern Iraq, Vietnam.                   | • mine action teams  
• community development focus  
• limited MAM |
| NPA        | 1992             | Angola, Bosnia and Herzegovina, Cambodia, Kosovo, Lao PDR, Mozambique, northern Iraq/Kurdistan, Thailand. | • mine detecting dogs & MAM  
• community development |
| HI         | 1996             | Mozambique, Cambodia.                                                        | • proximity de-mining  
• community focus |
| MGM        | 1996             | Angola, Mozambique, Namibia.                                                 | • MAM  
• technical innovator  
• community development |

* Includes surveys

NGOs are also important agents for the transfer of technology and innovation. The HALO Trust and MGM are in the vanguard of cheap and appropriate technical innovation for mine clearance. These organisations have not been distracted by the search for an all encompassing solution to mine clearance. Rather than relying on high-tech machines, these organisations have used low technology and low-
Beyond De-mining

cost machines in specific task-oriented roles to increase the speed, efficiency and safety of clearance. For example, MGM has adapted vehicles used previously by the military to assist in the clearance of bush and undergrowth for faster manual mine clearance. The NPA also played a pioneering role in using mine detecting dogs for specific mine clearance tasks (area reduction and verification).

Some analysts have criticised NGOs for their relatively low productivity rates and high costs. Simple cost-efficiency and productivity comparisons between NGOs and commercial operators usually show the latter to be cheaper and more cost-effective. Some NGOs have probably been guilty of failing to adopt the most efficient and cost-effective methodologies. Increased donor understanding of mine clearance and competition from commercial companies has forced NGOs to seek more efficient and cost-effective technologies and methodologies.

Humanitarian mine action NGOs will continue to play an important role in shaping the industry. They will continue to innovate technologically and adopt novel approaches to maximise the benefits of mine clearance for communities. Also, NGOs are likely to facilitate the industry's closer co-operation with the broader humanitarian assistance sector.

Commercial mine clearance companies

The conclusion of the UN-sanctioned Gulf War in 1991 provided a platform for the employment of commercial mine clearance operators in the affected areas. Nearly a decade later commercial operators have become an integral part of the humanitarian mine action industry.

Following Kuwait's liberation, the government was faced with the task of clearing the remnants of the war. The occupying Iraqi forces were reported to have laid 'millions' of mines along Kuwait's borders to prevent retaliatory ground invasion. The allies also contributed to contamination by explosive debris, having deployed tens of thousands of UXOs (such as cluster bomb units and Gator mines) following the air and ground campaigns. In total more than 728km² of land was estimated to have been contaminated with landmines and UXOs.²⁹
Over the next four years the Kuwaiti government spent US$800 million hiring more than 4,000 private contractors to clear the landmines and UXOs.\textsuperscript{30} The Kuwait experience produced a number of individuals, mostly serving or retired military officers, seeking similar highly paid jobs in what had become a lucrative industry.

A combination of two factors led to the proliferation of commercial mine clearance companies. First, at the time the UN estimated that more than 110 million landmines awaited clearance world-wide. If the removal of Kuwait's estimated 5-7 million landmines had netted in excess of US$800 million, it followed that commercial companies stood to make considerable profits from the detritus of war, wherever it was to be found.

Second, a pool of relatively skilled professionals filled an operational vacuum in the mid-1990s because the UN and NGOs could not increase their capacity sufficiently to meet the increases in both funding and demand for mine clearance.\textsuperscript{31} Commercial operators also found favour with many donors because they introduced new technology (such as machines and dogs) and increased general productivity. Donors were quick to realise the political gain in hiring commercial operators to clear high profile areas before the UN and NGOs could mobilise additional resources. In short, commercial companies seemed more professional than NGO operators and UN-administered MACs and therefore offered a viable alternative.\textsuperscript{32}

One commentator notes 'the mine action sector is probably the most commercialised sector of international humanitarian assistance'.\textsuperscript{33} Of the transnational commercial operators, most companies are predominantly American, British, South African and Zimbabwean. Each has established itself as a world leader in innovation and design.

Indigenous commercial mine clearance companies have also come into being in mine-affected countries. At least 12 commercial contractors are available in the southern African region.\textsuperscript{34} Only three southern

\textsuperscript{30} Horwood, op. cit., p.31.
\textsuperscript{31} Horwood, op. cit., p.31; and author's interviews with stakeholders in Maputo, July 1999.
\textsuperscript{32} Horwood, op. cit., p.31.
\textsuperscript{33} These include: Africa De-miners, Afrovita, BRZ, CG-TVA, Empresa Mocambicana de Desminagem, Koch MineSafe, Mechem, Mine-Tech, QA International, Rom Tech,
African companies, Mechem, Mine-Tech and Special Clearance Services, have the capacity to operate outside the region.

Commercial companies have contributed towards the industry in three ways. First, many commercial companies have introduced new technology. Companies such as Mechem, Mine-Tech and Ronco are conduits for research into new technology for more efficient mine clearance. These companies have larger research and design budgets than NGOs, and can invest accordingly. Also many commercial companies conduct research for national militaries. Unlike many research centres and institutions, these organisations have first-hand knowledge of the realities in the field, and therefore produce technology and equipment that is reliable and, more important, appropriate to the actual need. Too often new humanitarian mine clearance technology requires expensive and complex mechanical support systems rarely found in most mine-affected countries.

Second, the introduction of new technologies and methodologies has allowed commercial companies to accept the large infrastructural clearance projects that NGOs could not or would not undertake. For instance, companies like Mechem (South Africa), Mine-Tech (Zimbabwe), Ronco (US) and Royal Ordnance (UK) were clearing roads and power lines in Mozambique in 1994 while the UN was struggling to establish an indigenous mine action capacity. In this regard commercial companies are also relatively flexible in adapting to changing political environments in many post-conflict countries, because they are freer from political interference and bureaucratic regulations.

Third, the entry of commercial companies has introduced ethical issues. The possibility of operators being tempted to 'cut corners' in mine clearance activities in order to increase profits has been raised by some donors and interest groups. This in turn raises the question of reliability. Was the work performed at a sufficiently high level to meet humanitarian standards? Put simply, could people live and work in the areas cleared? This has led to closer examination of commercial companies' operations: 'fly-by-night' operators in Mozambique confirmed some of the role players' worst nightmares. On the positive side these questions also led to heightened scrutiny of the entire industry's quality control and standard operating procedures. For the first time the

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Special Clearance Services and TNT De-mining.

26 Individuals also contribute significantly in providing independent testing and analysis of products to numerous research institutions throughout the world.

36 Most NGO de-mining organisations have very strict terms of reference which prohibit them from clearing land which will be used for commercial profit.

37 Boulden & Edmonds, op. cit., pp.85-86.
question of international standards was openly debated and discussed.

Commercial companies and NGOs soon realised that their future depended upon the quality of their end product, and that their reputation was only as good as the outcome of their last contract (as perceived by donors and national authorities). In the case of commercial companies, unethical operators were soon blacklisted while the more professional companies established themselves as reliable operators. Currently most national authorities, as in the case of Mozambique, require independent quality assurance to be conducted on at least 10% of the land cleared by commercial companies to ensure that the high standards for humanitarian mine clearance are met.

Commercial companies are the most flexibly structured of the three types of mine clearance operators. They adapt their size and methodologies to the requirements of the contracts at hand. These organisations fill the vital gap between the community-focused NGOs and UN-administered mine clearance operations. As peace and economic prosperity return to post-conflict countries they will increasingly be called upon to clear areas for commercial and public use.

Conclusion

This assessment highlights the emergence of an industry dominated by three types of role players. Over the last decade this industry has not only replaced traditional military methods with integrated approaches to reducing the threat of landmines, but it has also altered its perception of the problem.

As mine action proceeds into its second decade, it will become part of the broad humanitarian assistance sector. Mine action is as necessary in emergency relief situations as it is in post-conflict reconstruction and development contexts. For this reason mine clearance will continue to be a vital element in many developing countries, with greater emphasis given to the incorporation of multi-disciplinary approaches.

A starting point for greater integration into the humanitarian sector is the closer co-operation between the three types of de-mining operations. The antagonism that has developed over the last decade is partly a result of the competition for funds between NGOs and commercial companies, and rivalry in the drive to develop the best practices and most appropriate methodologies. It is also in large part due to a lack of communication and co-operation between de-mining organisations. This has led to a misunderstanding of each other's roles within humanitarian mine clearance. For instance, MAG's mine action teams are most likely to achieve lower productivity and cost-efficiency levels than a de-mining section from Mine-Tech. But this is a case of comparing apples with oranges. Commercial companies clear areas
stipulated in their contracts, normally terrain around infrastructure and other amenities. NGOs have a broader mandate that could include the rebuilding of bridges, which adds considerable benefits to communities. Each operator has a role to play, and humanitarian mine action needs the full range of actors.

Increased integration in the broader humanitarian sector also requires a change in the mind-set of the de-mining operators. Mine action developed rapidly and in isolation from other development sectors, thus insulating it from many of the best practices developed in other fields. Some methods and approaches currently used by mine action practitioners will have to make way for these more progressive systems. Some will attempt to halt the integration of technology because of vested interests (such as job preservation and resource allocations). Notwithstanding these challenges and contradictions, closer cooperation and complementarity with other development sectors is necessary if mine action is to make an effective contribution towards long-term reconstruction and development in war-torn countries.
National Co-ordination and Capacity Building of an Unsustainable Industry

Leon Terblanche

Introduction

Tens of thousands of landmines continue to pose a threat to several southern African countries. In Zimbabwe, the activities of daily life and the chance of broader development are held hostage by the landmine contamination in residential areas, while in Mozambique and Angola internally displaced persons (IDPs) cannot be resettled and infrastructure and reconstruction projects are hindered by the presence of landmines.

The primary responsibility for dealing with the threat of landmines and unexploded ordnance (UXOs) lies with the State concerned. The affected country's government should assume overall responsibility for the co-ordination, resourcing and management of a national response. This is usually conducted through a national mine action programme. When required, the United Nations Development Programme (UNDP), in consultation with all stakeholders, including the UN Mine Action Service (UNMAS), relevant local partners, non-governmental organisations (NGOs), donors and UN entities assist governments in the creation of sustainable national capacities, and the development and implementation of integrated mine action plans.

National governments have to find the most cost-effective ways of eradicating their landmine problems. The challenge is to determine the scope and content of the national capacity required, the sustainability of the effort when funded from national resources, cost-effectiveness and the use of appropriate technologies and methodologies. With these factors in mind, governments have to decide on the approach that suits them best.

There are numerous models that governments can adopt to deal with the threat of landmines (see below). Governments rarely want to create or sustain a 'mine action industry' to deal with a problem which should diminish over time, and donors will not fund mine action indefinitely. Therefore, assuming the landmine problem in southern Africa is finite, and that government and donor funding is limited, it can be said that the notion of developing a mine action industry is impracticable.

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National capacity building

Capacity building should address various functions, which include the managerial, institutional and operational aspects of de-mining. Lessons learnt, such as those outlined in the 1997 UN Department of Humanitarian Affairs study, clearly indicate that the challenge lies in building the managerial and institutional capacity within the country. This is the area in which the UNDP, with the assistance of an executing partner such as the United Nations Office for Project Services (UNOPS), focuses its efforts on assisting national governments. National capacity refers to the ability of a government and nationals to plan cost-effectively, prioritise and implement all aspects of mine action in an integrated manner. Developing a de-mining capacity at the operational level is usually relatively simple. Developing a national management capacity with an effective institutional framework and processes and an integrated programme is far more complex and time-consuming. The national capacity has to be sustainable, and this must be reflected in the programme design.

For governments to deal with the mine problem in a cost-effective manner, they need to draw on both national and international capabilities. As a rule of thumb, it is usually correct to state that a specialised capability with a limited scope of application is the less attractive option when a national capacity is being developed. The more attractive option (see comments on the 'preferred model' given below) develops a more wide-ranging and sustainable national capacity.

Cost-benefit analyses should be conducted on a case-by-case basis to decide what is desirable given a country's situation. Evaluation of the socio-economic impact of landmines is a useful tool in determining the appropriate level of investment for the elimination of the threat of landmines. In this regard, the UNDP has initiated a study of the socio-economic impact factors and criteria, which is now executed by the Geneva International Centre for Humanitarian De-mining (GICHD) (see Chapter 10).

Within the UN system, UNMAS is the focal point for mine action and the co-ordination of activities. The UNDP is responsible for addressing the socio-economic consequences of landmine contamination, and for supporting national capacity building to ensure the elimination of landmines for the resumption of normal economic activity, reconstruction and development. The UNDP has the primary responsibility of assisting governments with the development of integrated, sustainable, national mine action programmes.

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Beyond De-mining

At the country level an integrated approach is required to address the impact of landmines effectively and decisively. The UNDP supports the following aspects of a mine action programme as integral components, tailored in scope according to country specifics:

• a management infrastructure, including quality management system and a mines information system (MIS);
• institutional arrangements providing an enabling framework;
• mine awareness and risk reduction education;
• minefield surveys and marking, closely interacting with the MIS;
• training of key management staff and de-miners in all aspects of mine action and support;
• mine clearance and explosive ordnance disposal; and
• victim assistance and the socio-economic reintegration of victims.

An integrated approach such as this usually ensures government compliance with the Ottawa Treaty obligations — assuming the reports are provided, the stocks are destroyed and landmines are no longer manufactured, used or distributed.

There are several options available for designing institutional arrangements and programme execution to ensure effective national planning, prioritisation, co-ordination and implementation. A core team of international experts is usually required to assist national staff to develop and implement the appropriate design, and also to interact with and draw on the UN system through the UN Resident Co-ordinator. International experts also facilitate interaction with the donor community for assistance on technical matters, co-operation, co-ordination and resource mobilisation. Ultimately the institutional arrangements are dependent on the country’s situation and its particular needs — one model does not ‘fit all’. Cambodia and Afghanistan represent two ends of the spectrum. The former is a well-structured national institution, while the latter is an NGO-based programme in a country with no recognised national government.

The preferred model seems to be one of government ownership with national planning, policy guidance and co-ordination, but execution through a balance of public and private sector involvement. This develops sustainable local capacity for cost-effective programme components. The programmes in Laos and Croatia are examples of successful national capacity building models.

Many role players are typically involved in mine-affected countries. These include various government departments or ministries, NGOs, national militaries and police, commercial companies (national and international), the World Bank and other donors and UN agencies. The challenge is to direct and co-ordinate these players in a manner that addresses national and regional priorities optimally, but does not control...
the process in a way that might encourage inefficiency or corruption, or rebuff potential partners. This is a delicate balance to strike. The core team assisting the government and Resident/Humanitarian Co-ordinator can be important allies in achieving this balance.

The following figure illustrates the conceptual design for a national programme, indicating the components to be developed, and some important relationships within these components which are described below:

**Figure 1**

**National Mine Action Structure**

- **Components**
  - Awareness
  - Survey & marking
  - Training
  - Clearance incl. EOD
  - Victim assistance
  - Advocacy
  - Quality management
  - Mine information
  - Treaty Compliance

- **Partners**
  - NGOs
  - Companies
  - Military
  - National staff
  - Other ministeries
From Figure 1 it should be clear that national capacity building involves certain prerequisites.

- **Formal agreements should have been drawn up with the national authorities, describing the assistance or co-operation required.**
- **National commitment should be demonstrated through legislation and a clear mandate to the international experts; an undertaking to provide mine action staff, facilities, equipment, funding of salaries and operating costs; and a declaration of government support for compliance with the Ottawa Treaty.**
- **An expatriate core team should be inserted as soon as possible to advise and facilitate, while working with national counterparts appointed from the outset of the operation.**
- **Three distinct functional levels should be addressed:**
  - The policy/political level, with inter-ministerial representation and a formal mechanism for donor interaction. The UNDP Resident Representative should also be involved.
  - The Mine Action Centre (MAC), with emphasis on national planning, co-ordination and prioritisation. This is achieved through technical work groups typically involving ministries, NGOs, national assets (such as the army) and donor representatives. If required, regional offices (in this context meant to be inside the country, with limited policy and technical planning/co-ordination functions) can be established to cover countries with very large areas to be de-mined. UNDP/UNOPS staff would fill the roles of Chief Technical Advisor (CTA) and other Technical Advisors (TAs).
  - The operational/execution level, involving national assets, NGOs and qualified commercial companies. These are tasked/contracted by the MAC in accordance with the national mine action plan and priorities. Ideally this should not be designed as a vertically integrated organisation. TAs, instructors and supervisors can be present here in supervisory and monitoring roles.
- **The UNDP’s involvement/facilitation can be summarised as:**
  - The Resident Representative/Co-ordinator should work at the policy/political level, co-ordinating the UN system, and synchronising and mobilising donors;
  - The trust fund or a cost sharing modality should be established and managed to offer the international donor community an entry point and mechanism to channel funds directly to the field where they are needed most to empower victims;
  - The UNMAS/GICHD developed Information Management System for Mine Action (IMSMA) should be installed and local representatives trained to use it. The IMSMA provides a mechanism for impact analysis which directly influences decision-
making on prioritisation and tasking.

- A national mine action plan should be developed as soon as possible, reflecting national, regional and community priorities—ideally in support of other national development projects. This becomes the tool for tasking, co-ordination, communication, reporting and resource mobilisation. The national mine action plan is a MAC responsibility, and it is developed jointly through the technical work group mechanism and approved by the policy body.

- All aspects of an integrated mine action programme should be co-ordinated by the national MAC and its regional offices. This does not mean that the MAC executes all programme components. The MAC in its system manager role acts as a facilitator, to ensure all aspects are addressed adequately and in an integrated manner.

The UNDP Resident Representative in the country is also the Resident Co-ordinator. She or he is normally the government’s entry point into the UN system, and will respond to the country’s requests for assistance. Formal requests for assistance will be handled within the Resident Representative’s delegated authority. She or he can draw on support from the New York-based Regional Bureau and the Mine Action Team in the Emergency Response Division (ERD). The ERD team provides the Resident Representative and country team with policy guidance, technical assistance, resource mobilisation and liaison services.

Conclusion

All the landmine-affected countries in southern Africa stand to benefit from this approach to national co-ordination and capacity building. Most countries already have an operational capacity to address the problem. A good example is the current project to strengthen the Instituto Nacional de Desminagem in Mozambique. However, the managerial capacity and institutional arrangements can be strengthened for improved national planning, prioritisation and co-ordination. Ultimately this will result in optimal return on resources committed.

By collectively utilising the existing capabilities, co-ordination mechanisms and expertise, a country can develop a national mine action capacity which is capable of decisively addressing the mine/UXO problem—clearing the fields using sustainable national capacity without creating an unsustainable ‘mine industry’.

The UNDP remains committed to providing governments with the best possible assistance within our means.
LANDMINES constitute one of the many serious problems facing the world as we enter the twenty-first century, afflicting nearly one-third of the world’s countries, restricting the potential of national development efforts and impairing the realisation of true human security within infested regions. It is a sad fact that many of these mine-affected countries are in Africa. However, the terrible impact of anti-personnel landmines has been recognised, and this recognition has provided the stimulus for successful action on the part of the international community. In particular it has led to the development of crucial links between the United Nations and civil society in mine action planning. In recognition of the multi-disciplinary nature of mine action and of the requirement for enhanced co-ordination, the United Nations Mine Action Service (UNMAS) was established in 1997 to serve as the UN’s focal point for landmine-related issues and activities. The nature of this role requires UNMAS to play a central part in all aspects of what is a holistic activity. As such, it requires a proactive and focused response in terms of policy formulation, implementation and the reporting of findings and activities to the broader community.

Policy development and co-ordination

In its capacity as focal point, UNMAS is responsible for ongoing policy development and co-ordination with regard to UN mine action activities. In 1998, in collaboration with 10 UN departments, agencies and other concerned UN entities, UNMAS prepared a comprehensive document entitled Mine Action and Effective Co-ordination: the United Nations Policy, to provide appropriate guidance for UN activities worldwide. Within the context of this document, UNMAS has continued to develop the principles of UN mine action through the preparation of additional guidelines, such as those published in 1999 pertaining to UN support of government mine action programmes involving collaborative arrangements with the military. These policies are being further

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supplemented through the ongoing production of other complementary clarifying documents, such as a five-year strategy paper.

**Assessment and monitoring of the landmine threat**

One of UNMAS' main responsibilities is to assess and monitor the global landmine threat, with a view to identifying needs and developing appropriate responses in a systematic manner. In 1998 five inter-agency and multi-sectoral assessment missions were conducted in Azerbaijan, Burundi, Ethiopia, Somalia and Yemen. In 1999, six additional missions were conducted to Kosovo, Lebanon, Jordan, Ecuador, Peru, Zimbabwe and Namibia. So far in 2000, assessment missions have been conducted in Egypt, Nicaragua, Zambia and Belarus, and additional missions remain under consideration. The aim of these missions is to define the scope and nature of the landmine/unexploded ordnance (UXO) problem in the affected countries, identify constraints and opportunities relating to the development of mine action initiatives, and make recommendations for a comprehensive response, including institutional arrangements for the co-ordination and implementation of mine action activities. Technical missions have also been conducted on a more limited scale in support of new and ongoing operations, with visits in 1998 to Sudan, Iraq and Guinea-Bissau; to Kosovo, Nicaragua and Honduras in 1999; and to Sierra Leone and Mozambique after the floods in 2000.

The implementation of Level 1 impact surveys is often a natural follow-up to assessment missions, designed not only to identify the general location of mined or suspected mined areas, but also to measure the humanitarian and socio-economic impact of landmine contamination. Such surveys focus on collecting information for clearance activities and for mine awareness and victim assistance programmes in support of a complete national response. The determination of priorities as a result of this process allows activities and resources to be concentrated in the areas of greatest need, in line with the UN policy of developing a comprehensive profile of the landmine problem at a global level.

**Information management**

Given the scope of the landmine problem, the wide spectrum of factors that need to be taken into consideration and the number of actors involved, the development of an appropriate information management system has been a priority for UNMAS. It has been apparent that such a system will greatly support and enhance monitoring, planning and programme implementation throughout all mine action activities. It will
serve the needs not only of the UN but also of other partners by providing a better picture of the worldwide landmine threat. The initiative to create this Information Management System for Mine Action (IMSMA) has been facilitated through an agreement between UNMAS and the Geneva International Centre for Humanitarian De-mining.

Initial steps in the development of the IMSMA field module have been completed, and the module has been successfully deployed in Kosovo and Yemen, providing a theatre-wide tool for the collection, maintenance and dissemination of data on landmines and their impact. UNMAS is also providing ongoing support for the provision of training courses to IMSMA users, while actively demonstrating and advocating the use of this system to selected organisations, national governments and other mine action partners. The IMSMA field module is being made available to new and existing mine action programmes, with a view to providing a benchmark system for the consolidation and use of landmine data in affected countries throughout the world.

The development of the complementary IMSMA headquarters module is also under way, incorporating both information processing and dissemination modules, and including additional tools such as the recently developed Database of Mine Action Investments. The adoption of such a modular approach in the development of the IMSMA system means that the product can be maintained as a developing asset to the mine action community, with scope for improvement and adjustment as the situation requires. In the same manner, valuable secondary benefits are also making themselves apparent in the development of enhanced headquarter databases and country profiling systems, resulting in improved information processing mechanisms within the mine action service.

Programme initiation and programme support

Since the initiation of the first humanitarian mine action programmes in 1988, UN field activities in support of emergency situations, peacekeeping operations and longer term, integrated mine action programmes have developed considerably. While direct responsibility for the latter rests primarily with the United Nations Development Programme (UNDP), the Office for the Co-ordination of Humanitarian Affairs (UNOCHA) co-ordinates activities in Afghanistan, while the Iraq 'Oil-for-Food' Programme does so in Iraq. In this context, UNMAS is responsible for ensuring global co-ordination of all activities and assisting in the establishment of programmes in a growing number of situations. In all of these activities, UNMAS remains involved in an advisory and monitoring capacity, acting as the repository for central
UNMAS also continues to support mine action in the context of peacekeeping operations as these requirements arise and forces are deployed, while also maintaining a contingency planning role for any future crises. This has seen support dispatched to Sierra Leone and the co-ordination of assistance within Tajikistan, while potential operations within central and sub-Saharan Africa also remain under constant consideration. Assistance for flood-related mine action within Mozambique has also been facilitated with UNMAS support in 2000, as a result of the impact of heavy flooding in many contaminated areas around the country. The inherently short notice and unknown scope of such operations, however, continue to place pressing demands on the limited resources available for such activities.

National capacity

In such a context, UNMAS and other UN agencies are expected to assist routinely in creating sustainable national capacities and preparing and implementing an overall mine action programme plan. In doing so, however, it is crucial for agencies to recognise that the primary responsibility remains with the concerned state. The government of the affected country should assume overall responsibility for the co-ordination and management of its own national mine action programme. Specifically, national entities need to fulfil three primary functions:

• define and articulate overall policy and direction;
• co-ordinate and manage a programme capable of addressing the humanitarian implications of landmines and UXOs; and
• generate and allocate resources in line with clearly defined priorities.

Apart from these functions, national entities also need to be able to ensure that the overall endeavour is accountable, is undertaken in a cost-effective manner and is undertaken as an integral component of those strategies designed to rehabilitate national healthcare, education, infrastructure and agriculture systems.

At the same time, existing institutional requirements, and the manner in which state machinery normally functions in the affected country, also need to be considered. In situations where the involvement of national and/or de facto authorities is inadequate, extra care must be taken to ensure that the national capacity being generated is appropriate and takes local realities into account. Moreover, efforts should continue to assist national authorities to acquire the skills and institutional mechanisms which allow them to determine overall policy and direction.
Past experience has highlighted the critical importance of the UN having a clear and unified perspective on the way in which it will help national authorities acquire a capacity to deal with their landmine/UXO problems. It should be said, however, that in terms of institutional arrangements, a single template solution which can be applied to any mine-affected context simply does not exist, given the diverse realities and interests which characterise different settings. For example, a country where war has never abated and a central administration does not exist will require an approach which is different to that pursued in a second country, such as Zambia, where the authority of the government is not disputed and it is tackling the problem of mines and UXO many years after the cessation of hostilities.

Again, it should be emphasised that such a method, while not offering a simple template solution, has nonetheless outlined a clear and unambiguous relationship between the entities involved and has built upon lessons learned from the establishment of other missions and projects. So far, this approach has proven successful.

**Conclusion**

Even as lives continue to be saved and valuable assets returned to productive use through the elimination of landmines, the success of mine action endeavours remains dependant on the political commitment of the parties involved, on the overall security situation and on the effective co-operation of all other parties willing to provide assistance. The need to provide an integrated response that considers all of these aspects remains an ongoing challenge. In its capacity as UN focal point for mine action, UNMAS stands ready to facilitate and support all international efforts.
The Role of the National Institute for De-Mining in Mozambique

Artur Verissimo

Introduction

After nearly 20 years of conflict, Mozambique has been left with a substantial landmine and unexploded ordnance (UXO) problem. Landmines were used by both warring parties during the civil conflict, and today it is estimated that 1,800 minefields are scattered throughout the country. The minefields are concentrated in the southern provinces of Maputo and Inhambane, and the central provinces of Tete and Zambezia.

The Mozambican government has recognised that landmines and UXOs are, and will continue to be, a major obstacle to resettlement, reconstruction and sustainable economic development throughout the country. Signalling the importance of the landmine and UXO threat, and its commitment towards a counter-mine strategy, the Mozambican government signed the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction (Ottawa Treaty) in 1997, and ratified it in 1998. Subsequently, Mozambique hosted the Second International Treaty Meeting in Maputo in May 1999.

Furthermore, to make provision for new challenges within the mine action environment, the government made significant changes to its strategy to counter the landmine and UXO threat in Mozambique. On 10 June 1999, the Council of Ministers approved new legislation changing the status of the Comissão Nacional de Desminagem (CND) to a semi-governmental institute—Instituto Nacional de Desminagem (IND). These changes also included a re-arrangement of the organisation’s structure, providing the IND with increased administrative and financial autonomy and more latitude to make decisions relating to strategies, policies and overall co-ordination of mine action operations.

IND's vision and mission statement

IND’s vision is to establish and maintain an environment in which all mine action agencies can optimise the removal of landmines and UXOs.
in Mozambique. As such, the IND is the focal point for mine action in Mozambique.

The institute hopes to fulfil its vision through managing, co-ordinating and facilitating mine action at the national level, and in cooperation with the international community. Its mission statement lays out its intention to:

- create a team of dedicated professionals;
- ensure the IND will possess both the ability and capability to execute its mandate and vision; and
- be transparent and accountable in all its actions, to guarantee sensible utilisation of government and donor resources.

**Roles and functions**

The capabilities, knowledge-base and experience existing within the IND need to be developed over a period of time. This will enable the IND to fulfil its roles and functions effectively and efficiently. The roles and functions include:

- acting as a focal point and co-ordination mechanism for all mine action activities in Mozambique;
- co-ordinating mine action to support humanitarian relief and resettlement programmes, bearing in mind the recent and future possible natural disasters;
- co-ordinating mine action for the support of reconstruction and socio-economic development of Mozambique;
- developing a sustainable, comprehensive and integrated mine action plan for Mozambique;
- facilitating the development and maintenance of an indigenous mine action capacity;
- maintaining and further developing the existing mine action database to supply user-friendly information to all agencies involved in mine action by upgrading the existing database into an Information Management System for Mine Action (IMSMA);
- developing, implementing and distributing technical and safety standards to all mine action-related operations;
- developing and implementing a quality assurance system for verification of all mine action-related activities which conforms with the internationally accepted humanitarian de-mining standards; and
- actively participating in resource mobilisation for the support of mine action in Mozambique.

In short, the IND is the primary facilitator of mine action in
Beyond De-mining

Mozambique. The organisation focuses its efforts on ensuring that mine action is conducted in accordance with national priorities. As such the IND is not involved in the operational aspects of mine action, but sets priorities to ensure that Mozambique’s national needs are met.

**National priorities and strategy**

Mozambique’s national mine clearance priorities are set out in a government decree. These national priorities are resettlement of the population:

- in areas with access to social infrastructure (such as education centres, hospitals, commercial centres and other vital basic infrastructure); and
- in specific areas of socio-economic interest, with special reference to areas identified as high potential agricultural land, and areas with roads and bridges, railway lines, and energy and industry.

Using these priorities as a starting point, the government has developed a national strategy for mine action in Mozambique. The strategy has eight key functions:

- the creation of a national mine action capacity to provide a long-term solution;
- the creation of mechanisms to meet the needs of communities and foster the participation of civil society at national, regional, provincial and district levels;
- the promotion of an integrated approach for determining national mine action policy and plans to support socio-economic reconstruction and development;
- the promotion of technological development;
- the collection, verification, classification and dissemination of mine information;
- the co-ordination of mine awareness to prevent landmine incidents;
- the co-ordination of victim assistance for landmine survivors; and
- the facilitation of mine action in Mozambique, with special attention to quality assurance management.

**IND strategy**

As the national mine action facilitator, the IND has to take into account several factors which are vital for the successful implementation of its mandate.

First, the IND must consolidate and develop relationships with
existing mine action capacities in Mozambique (such as the Accelerated De-mining Programme (ADP), Norwegian People's Aid, HALO Trust, Handicap International). This will not only engender a sense of partnership amongst mine action role players but also develop key competencies within the organisation. In short, the IND must develop sufficient capacities to co-ordinate, supervise and manage mine action at national and sub-national level. This will include the development of key documentation to provide mechanisms for accreditation, guidelines for technical and safety standards, quality assurance management and information system management.

Second, mine action operators — non-governmental and commercial — face daily bureaucratic problems which ultimately negatively affects their output. The IND must provide assistance to these organisations on a range of issues (such as issuing of visas, customs clearance), especially at provincial and district levels, where the greatest difficulties are encountered.

Third, a national Mozambican de-mining capacity is required in the long-term. The ADP is the basis for such a future national capacity and in the interim it could be the IND's technical arm. The IND envisages expansion of the ADP's mandate to include the entire country.

Fourth, currently the IND does not possess sufficient capacity (human and financial) to carry out its mandate effectively. The IND is aware of the necessity of creating an environment for the effective fulfilment of national needs, and as such will display a clear and visible willingness to become an effective partner in the broader mine action structure.

Fifth, the institution must address the issue of donor confidence. Donors are requested to stipulate the mechanisms, needs and outputs required to build confidence in the institution. The IND would welcome the establishment of a steering committee for mine action which it would chair to discuss plans, outputs and requirements on a monthly basis.

Sixth, effective co-ordination of all mine action partners in Mozambique requires an assessment of national needs and the utilisation of donor funds in the most efficient manner. New mine action programmes need to be included in the national strategy. Donors can assist in this process through the inclusion of the IND in their funding agreements.

Seventh, the IND understands that one of its key functions is the development of a National Mine Action Plan with a Works and Priority Programme. This function will include co-operation with, and support from the technical partners, provincial and district authorities, affected communities and affected national government departments, and will require the inclusion of available Level 1 survey information.
Taking the eight key functions of the national strategy into account, the IND's strategy is based on building national capacity. This involves developing sub-national co-ordination mechanisms, national mine action policy, technological expertise, IMSMA, mine awareness, victim assistance and quality assurance management.

**Building national capacity**

As the facilitator of mine action activities throughout Mozambique, the IND needs to establish and co-ordinate mechanisms and technical working groups at national and sub-national levels. This requires the expansion of the institute's structure in terms of international technical assistance and additional national capacity, as shown in Figure 1 (see p.48).

The IND’s organisational structure will be rationalised and optimised in order to keep it as small as possible. The initial six technical advisors (TAs) will be reduced to four after approximately one year. Apart from the increased number of TAs, more Mozambican staff will be hired to perform the additional functions of the expanded organisational structure. All roles and functions will be clarified, and specific terms of reference (TORs) developed for each position. Likewise, the issue of IND staff remuneration will be addressed. The IND is not a government department and its staff are not public servants; yet specialised functions are performed by the institution and its staff. Therefore as a motivational factor for its staff the legal status of the IND should be reassessed so that additional funding can be sought for topping up salaries and implementing the required structural changes. The IND would be funded as a programme supported by the Mozambican government and the donor community.

Rationalisation of the IND will, however, require short to medium-term technical assistance. Specialist advice in the form of at least four to five international technical experts is required, and a project for such technical assistance must be developed as soon as possible.

The IND will promote the development of the ADP as the local national de-mining capacity to which all operators will be encouraged to contribute. In addition, TORs and standard operating procedures (SOPs) will be developed for all operators and implementing partners.

**Development of sub-national and national co-ordination mechanisms**

The IND's mandate is, for a number of reasons, currently limited to the southern regions of Mozambique. A primary reason is the lack of information exchange between Maputo and the provincial regions.
Figure 1: Expansion of the IND's structure

IND Director

- Deputy Director

- CT

Dept of International Relations (2 x Nationals)

Dept of Planning, Information & Research

- TA

- TA

Dept of Operations

- TA (Fin) Short-term

Dept of Admin

QA Manager + 1 X QA/Contracts Off

Mine Awareness Co-ordinator

- TA

Planning Off Research Off (2 x Nationals)

- TA

IMSMA Manager + 10 X Nationals

Regional Offices (X 2) (3 x Nationals)

- Fin Manager + 1 x National

Log Manager Procurement Transport

Support Staff (11 x Nationals)

Human Resources Manager
Therefore the development of an information flow system between regional operators and local or regional authorities is needed in accordance with the development of IMSMA.

Provincial and regional co-ordinating mechanisms should be based on the existing information networks used by the provincial police, government departments, NGOs and local communities.

To fulfil our strategy and mandate, the IND is in the process of establishing a co-ordinating mechanism at national level (see Figure 2 on p.50).

**National mine action policy and plan**

The national priorities, as set out in the government decree, must form the basis for the development of a national mine action policy and plan. This will entail separate policies for each of the eight components of the national strategy (for example, promotion of technological development). Furthermore, as the widespread flooding in southern Mozambique illustrated in early 2000, a disaster contingency plan must be developed as part and parcel of the IND’s structure, role and function.

A national mine action policy and plan will include:

- priorities, tasks, milestones and budgets for each department at IND headquarters;
- priorities, tasks, milestones and budgets for each region; and
- overall milestones to list all target or due dates for activities or operations for monitoring by the IND National Director and chief technical advisor.

**Technological development**

The IND encourages the application of new technologies in programmes and contracts (for example, the use of machines and dogs). The IND will also facilitate the testing of new technologies and ‘high tech’ equipment in mined areas. The use of new technologies will, however, have to conform to the national TORs and SOPs as set out by the IND. In close co-operation with the Southern African Development Community (SADC), the IND will review the SADC Technology Initiatives.

**IMSMA**

The IND views the establishment of a mine database in the Information Management System for Mine Action (IMSMA) format as its first priority. This initiative must be achieved through the pooling of existing resources, including the capacity currently utilised by the Canadian
International De-mining Centre (CIDC) in the process of completing a national Level 1 survey.

Incorporation of all available mine information into the IMSMA format is essential to Mozambique's efforts to remove the threat of landmines. This will require technical assistance support (including in-kind donations) from donors and existing programmes (for example, the ADP). The database needs to be fully operational by December 2000.

![Figure 2: National co-ordinating mechanism](image)

**Mine awareness and victim assistance**

While much attention is placed on mine clearance, mapping and marking, a national mine awareness strategy needs to be developed. Such a strategy will require the involvement of the United Nations Children's Fund and integration with existing victim assistance
programmes. It will also include integration of advocacy work in support of the International Campaign to Ban Landmines.

**Quality assurance management**

Development of a quality assurance (QA) management capacity is a vital aspect of the IND's strategy. QA cells will be located at the IND's headquarters in Maputo and at the bases of its regional representatives, to provide QA to operators working in each region. A practical and applicable QA system must be developed according to Mozambican realities (for example, the size of the country, the available resources, the nature of the mined areas, and so on).

**Conclusion**

These changes to the IND are intended to improve the government's capacity to manage national mine action and related issues, and to improve the IND's responsiveness to donors and operators.

The IND aims to focus on its core roles of planning and co-ordinating national and provincial mine action priorities within the country's broader development objectives. Accomplishment of these core roles through transparent, accountable and credible procedures will provide Mozambique with its best chance of making the greatest impact on mine-affected communities, and providing a better future for all Mozambicans.
Mine Clearance in a War Zone

Helder Cruz

Introduction

Angola is the most heavily mined country in southern Africa. It is estimated that between four and five million landmines have been laid across the country and that six to eight provinces are particularly heavily mined. Angola also has the highest number of amputees in the world (over 80,000). Current statistics on landmine and unexploded ordnance (UXO)-related incidents that have occurred in government-controlled areas indicate that almost 30% of these are fatal. An average of two to three accidents occur a day.

Currently the country is characterised by both a conflict and post-conflict environment. Renewed fighting between the Angolan government and the União Nacional para a Independência Total de Angola (UNITA) in December 1998 led to new incidents of landmine laying in certain areas, which compounded Angola’s existing landmine problem. Other areas of Angola have not been affected by the renewal of conflict. Emergency assistance is needed for those caught in the current conflict. On the other hand, communities in the areas not involved in the present conflict are attempting to rehabilitate their lives in a post-conflict environment. They require rehabilitation and development assistance.

The present rehabilitation and development activities are essential in ensuring that the most vulnerable do not remain in a state of absolute dependence, and retain some form of dignity. Mine action is an essential first step in supplying humanitarian aid in Angola.

The National Institute for the Removal of Obstacle and Explosive Ordnance (INAROEE) was established by an executive Council of Ministers decree (14/95) on 26 May 1995 as the body co-ordinating all activities related to the removal of landmines and UXOs in Angola. The decree called for the establishment of an institution at national level with a co-ordination, training and operational function including the deployment of mine clearance resources at provincial level. In order to ensure effective government-led humanitarian mine action and continued support from the international community, INAROEE has developed a national programme called ‘Humanitarian Mine Action in Support of Rehabilitation and Socio-economic Development’.

HELDER CRUZ is the General Director of the National Institute for the Removal of Obstacle and Explosive Ordnance (INAROEE).
Angola’s mine action programme in a conflict and post-conflict environment

Humanitarian mine action started in Angola in 1994 under the auspices of the Lusaka Protocol, with the introduction of specialised United Nations (UN) peacekeeping, and non-governmental organisations (NGOs) and commercial mine clearance units. UN support to the National Mine Action Programme started in early 1995 under the framework of the UN Angola Verification Mission (UNAVEM) III mandate.

The resumption of hostilities in December 1998 has had drastic implications for the humanitarian activities in Angola, particularly as far as landmine clearance is concerned. Humanitarian mine action operations have been suspended in certain regions of Angola because of the increased instability in the country. Nevertheless, mine clearance organisations have adapted their operations in accordance with the changing security environment. Some organisations have moved to areas with a more stable security environment, while others are conducting mine clearance operations in conflict-affected regions such as Malange, Bié and Huambo.

The withdrawal of the United Nations Observer Mission in Angola (MONUA) in early 1999 led to the suspension of INAROEE’s de-mining operations. All mine clearance equipment owned by the United Nations Department of Peace Keeping (DPKO) was withdrawn and stored at the Training School and Logistics Base in Luanda.

Under INAROEE’s co-ordination, humanitarian mine action organisations currently operating in Angola have concentrated their efforts on surveying. Several assessments were conducted to obtain information that would make the completion of a comprehensive, realistic picture of the landmine problem possible. These assessments were made in light of the new mines that were laid throughout 1999, particularly in the last ten months of the year. However, new mines were not laid throughout the country. Surveys carried out during 1999 provided the following indicators:

- The number of new mines laid is lower than initially thought. The numbers have been exaggerated and it is believed that three-quarters of recent landmine incidents are attributable to residual and not newly laid mines.
- Anti-tank mines have been laid in defensive minefields as reinforcements around military positions and strategic locations (like hydro-electric dams).
- During October 1999, the Angolan army planted 21 anti-tank mines around a military position at the strategic location of Vila-Nova, 30
kilometres northeast of Huambo. These mines were subsequently removed and delivered to the Hazardous Area Life Support Organisation (HALO) Trust for destruction.

- Only a small number of the new minefields are in areas previously de-mined by humanitarian mine clearance operators. The new minefields are in the areas worst affected by the recent fighting and include some airstrips, new and advanced artillery positions and access roads around urban areas.

- Many of Angola's 18 provinces are not affected by military action or landmines.

- Ninety percent of areas suspected to be mined have no strategic value and are not likely to be re-mined. A large proportion of these areas lie beyond the current areas of conflict, and mine clearance operations can be conducted.

- Between November 1998 and December 1999, mine clearance operators registered 2,333 minefields, of which 123 have been cleared by the humanitarian mine clearance operators working in the country.

The surveys gathered information from a broad cross-section of Angolan society. This included government authorities such as the police, Angolan Armed Forces (FAA), local administrators, local populations, NGOs, United Nations agencies and private companies. These stakeholders provided mine action operators with an improved perspective on the dynamic landmine situation in Angola at present.

Currently the situation is more stable, and there are better working conditions and improved safety in areas where mine action operations are being carried out. Therefore, there is an increased likelihood that the programme at national level to deal with the residual landmine and UXO problem can be resumed.

INAROEE believes that the solution to Angola’s landmine and UXO problem in a post-conflict environment is dependent upon the formulation and implementation of an integrated mine action programme. This programme must be a multi-dimensional response to basic humanitarian needs and standards. It must include the numerous integrated activities available to minimise the effect that landmines have on communities and social infrastructure.

INAROEE has developed the National Humanitarian Mine Action Programme 2000 to address Angola’s landmine problem. This programme is an integral part of the broader plan for humanitarian assistance and development support in Angola. The programme aims to:

- integrate all current government programmes into the National Emergency Programme; and
enable the safer implementation of government mine action priorities.

The national government’s mine action priorities include the:
• reduction of landmine and UXO incidents in Angola;
• promotion of the development of urban and rural communities;
• resettlement of internally displaced persons (IDPs) and refugees;
• rehabilitation of existing social and economical infrastructures;
• re-establishment of agricultural production (with greater emphasis on agricultural development poles); and
• rehabilitation and protection of the environment.

INAROEE hopes this programme will enable it to consolidate its existing co-ordination tools and gradually deepen and enlarge Angola’s humanitarian mine action capacity. This will also strengthen Angola’s capacity to manage humanitarian operations during crises and post-conflict periods. Moreover, it will contribute towards greater participation by the international community in Angolan humanitarian mine action.

The Angolan government fulfils the role of co-ordinating and promoting the development of a national mine action programme. As with its national strategy to mobilise resources and make allocations for the implementation of the National Emergency Programme for Social Assistance, the government has committed itself to mine action by declaring the following intentions:
• to revitalise and reinforce INAROEE’s role as the government institution responsible for the co-ordination of the National Mine Action Programme;
• to analyse the need for the allocation of funding to enable INAROEE to plan and administer its role effectively;
• to ratify the Ottawa Treaty when the political-military context permits;
• to allow greater participation of Forças Armadas Angolanas’ (FAA’s) military engineering units in humanitarian mine clearance; and
• to guarantee the safety of humanitarian mine action teams in unsafe areas.

During the 1999 landmine surveying process, it was found that 90% of zones for agricultural development and returnee resettlement were categorised as minefields in INAROEE’s database. The National Humanitarian Mine Action Programme 2000 aims to respond to the humanitarian organisations’ needs in the following manner:
### Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Response measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resettlement of IDPs and refugees</td>
<td>• Survey and mark safe areas</td>
</tr>
<tr>
<td>Settlement of returnees in productive and sustainable areas</td>
<td>• Locate areas free from mines/UXOs for agricultural production</td>
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<tr>
<td>Reduction of mine-related accidents and promote victim assistance</td>
<td>• Standardise and implement a mine threat alert policy</td>
</tr>
<tr>
<td>Rehabilitation of productive areas and social infrastructure</td>
<td>• Mark minefields and remove land-mines/UXOs close to communities and social infrastructure</td>
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<tr>
<td></td>
<td>• Allow safe use of land surrounding minefields</td>
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<td></td>
<td>• Prioritise mine clearance on potentially productive agricultural land</td>
</tr>
<tr>
<td>Re-opening of access roads</td>
<td>• Prioritise the clearance of access roads to allow the distribution of emergency assistance to inaccessible communities</td>
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<tr>
<td></td>
<td>• Shorten travelling distances and reduce transportation costs of food assistance and related activities</td>
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</table>

The programme recommends two priority-setting boards. The first is a provincial board which should respond to regional priorities in emergency assistance and assist the various rehabilitation and socio-economic development programmes. The second is a national board which should respond to the needs of humanitarian activities and national development projects.
Each board will contain the following priority categories:

### The national priority board:

<table>
<thead>
<tr>
<th>Provincial priorities</th>
<th>National priorities</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Activities should be defined in relation to the results of landmine situation assessments in each province*</td>
<td>* To respond to the short and medium-term needs of humanitarian operations*</td>
<td>* The completion of a consolidated plan for resource mobilisation*</td>
</tr>
<tr>
<td>* All activities should envisage the time frames for completion*</td>
<td>* To establish priorities for the medium- and long-term in support of other development programmes*</td>
<td></td>
</tr>
<tr>
<td>* All activities should indicate the needs in terms of estimated costs*</td>
<td>* To include the following: agricultural land, areas for resettlement, access roads, rehabilitation of social, economic and strategic infrastructures*</td>
<td></td>
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### The regional board:

<table>
<thead>
<tr>
<th>Municipality priorities</th>
<th>Provincial priorities</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>* All mine action activities at provincial level will be identified and prioritised*</td>
<td>* To respond to the needs of all humanitarian operations and rehabilitation and social development programmes*</td>
<td>* The completion of a National Plan for Resource Mobilisation*</td>
</tr>
</tbody>
</table>

For these boards to function effectively, the following principles need to be adhered to:

- prioritised areas must be free from armed conflict;
- local authorities must be consulted in advance;
- the local populations must be aware of the socio-economic benefits of
de-mining;
• returnees (refugees and IDPs) must be resettled; and
• rehabilitation and development programmes must be ready to follow the completion of mine clearance operations.

The regional and national priority boards must also oversee the implementation and utilisation of resources within certain time frames for specific tasks.

**INAROEE’s current role in Angolan mine action**

INAROEE’s current mandate includes two components: the co-ordination of mine action at national level and the implementation of mine action activities. These two functions have, however, caused numerous problems for INAROEE.

The institution hopes to take advantage of the current administrative trend in Angola, which is towards decentralisation and delegation. This process of modernisation will lead to significant changes in INAROEE’s organisational structure. It is imperative that institutional reforms occur at national and provincial level so that the institution is capable of attracting more donor support and can carry out its operations more efficiently.

Decentralisation would mean that the current regional INAROEE structure would be replaced by one using provincial representatives. Resources would be transferred from the institute to the current implementing partners (for example HALO Trust, Mines Advisory Group (MAG), Menschen Gegen Minen (MGM) and Norwegian People’s Aid (NPA). This would integrate the current INAROEE capacity with that of the NGOs. De-mining brigades would continue to operate under the central co-ordination of INAROEE, but the support and direct supervision would be conducted by the implementing partners. This would maximise the existing support systems and complementary mine clearance techniques (mechanical and dog units) introduced by the current operators.

These changes are likely to be more attractive to donors and, importantly, will allow INAROEE to concentrate its efforts on the co-ordination of mine action at national level.
Effective Expansion of the Toolbox:
Lessons Learned in Southern Africa

Gareth Elliot

Humanitarian mine clearance has grown phenomenally since the first operations in Afghanistan in the late 1980s. Today mine clearance is under way in 41 states, and hundreds of millions of dollars have been spent on the removal of landmines. Mine clearance has changed and adapted over the last decade to respond more effectively and efficiently to the problem at hand, particularly in the methods and approaches to removing landmines. Nevertheless what has remained consistent since the Second World War is the reliance on manual de-miners.

Manual de-miners conduct most mine clearance throughout the world, using metal detectors and prodders to locate the mines. This process is, however, slow and time-consuming. As a result, the international mine clearance industry has sought alternative technologies for the removal of landmines. Various methods and combinations of approaches are now used to assist in the clearance of landmines. However, after more than a decade, much debate still surrounds the adoption of these techniques in humanitarian mine clearance.

The toolbox

The use of machines and mine detecting dogs (MDDs) to assist de-mining has the potential to greatly increase the cost-effectiveness and speed of mine clearance. The efficient and effective use of these technologies in support of manual clearance offers a viable solution to the need for the reduction of landmines within years rather than decades.

The toolbox concept relies on the combined use of a number of clearance techniques. It considers the strengths and weaknesses of the available tools, and draws on those strong points of each method which are best suited for a particular clearance task. The combination of these mutually supportive techniques enables the most rapid and efficient mode of de-mining to be used, while maintaining the strict standards

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1 GARETH ELLIOT is the Finnish Government-sponsored Landmines and De-mining Researcher at the South African Institute of International Affairs (SAIIA), based at the University of the Witwatersrand, Johannesburg, South Africa.
necessary for humanitarian operations.2

Expanding the mine clearance toolbox should increase productivity and the cost-efficiency of de-mining. However, management of the toolbox poses one of the biggest challenges in achieving improved performance. Without sound planning and identification of the problem at hand, machines and MDDs could in many instances hinder mine clearance and increase the costs of de-mining; mine clearance operators have to use their tools in the most appropriate conditions.

The conference, The Road Forward: Humanitarian Mine Clearance in Southern Africa, held at the South African Institute of International Affairs (SAIIA) in June 2000, discussed the expansion of the toolbox in southern Africa. This chapter is based largely on these discussions, drawing on the participants' shared experiences in using mechanical and canine assets in support of manual methods. Additional input is provided by the author's field observations during his participation in the Landmines in Southern Africa project at the SAIIA.

At the outset two interrelated issues should be clarified. First, humanitarian mine clearance standards cannot be achieved without the use of manual de-miners. Machines and MDDs are always used in support roles, and never as stand-alone technologies. Second, there is no single system that can work effectively everywhere. There is no 'silver bullet' technology (machine or dog) that can respond in all contexts and against all threats.

More than just semantics

A great divide exists between mechanically assisted de-mining (MAM) and mechanical de-mining. To many the difference is merely a case of semantics. However, these terms are not mutually exclusive, and represent different understandings of the nature of mine clearance.

The difference between mechanical de-mining and MAM is simple. MAM is the use of mechanical assets in support of manual de-mining. It is an 'intelligent understanding of the nature of mine clearance'.3 Mechanical assets assist manual de-miners in a number of ways, ranging from cutting vegetation to removing tripwires to detonating the majority of mines. Their role in most cases is one of ground or area

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3 Hendrik Ehlers, MGM De-mining Network email forum, 9 November 1999. Ehlers has been at the forefront of promoting the concept MAM and multi-layered clearance (MLC). He is also a world authority on integrating various tools in the toolbox to achieve improvements in cost efficiency and productivity.
preparation through the removal of vegetation or obstructions that would otherwise hinder manual de-miners.

The German mine clearance non-governmental organisation (NGO) Menschen Gegen Minen (MGM) first proposed the MAM concept in 1996 to replace the then official term of 'mechanical de-mining'. The need for a name change rests on the realisation that no machine or mechanical asset can achieve the clearance rates required for humanitarian mine clearance. Most mechanical de-mining systems are based on military designs for battlefield conditions. These machines are generally designed for breaching enemy minefields and are therefore inappropriate tools for humanitarian mine clearance because flails, tillers, rippers or steel-wheeled Casspirs cannot detonate all landmines, even in the most ideal conditions. Field experience has shown that manual de-miners are needed to conduct follow-up clearance to ensure all explosive devices, especially detonators and parts of mines remaining after the use of flails and tillers, are removed from the ground to achieve the UN’s 99.6% clearance rate.

Machines and MDDs are merely tools in the toolbox; they cannot replace manual mine clearance and need to be incorporated in the process. These tools are used in a number of ways.

**Mechanical clearance methods**

Mechanical methods are used in most mine-affected countries. This method offers possibly the best solution to the need to speed up the clearance rate in a cost-effective way.

The foremost advantage of mechanical mine clearance is the increased speed of clearance and improvement in the safety of the people involved. For instance, flails are increasingly used to clear vegetation and tripwires and not landmines. Normally, the majority of a manual de-miner’s time (up to 80%) is spent clearing vegetation and checking for tripwires, so if the time spent on these functions can be reduced by mechanical methods, the overall rate of mine clearance can be significantly improved.

The main problem with most mechanical mine clearance methods is that they rely on the use of adapted military vehicles. Generally too heavy and large to be self-propelled, these machines need substantial logistical support in the form of low-bed trucks for transportation. In many countries these machines are too heavy to cross most bridges. New bridges have to be constructed or substantial detours undertaken. Simply getting the machines to the area of operation is therefore a complex and time-consuming task. The specialised machines also require spare parts that are generally not readily available in most developing countries.
Mine clearance operations are increasingly using relatively simple agricultural or construction machines adapted to suit mine clearance requirements. The Hazardous Area Life Support Organisation (HALO) Trust and MGM are two organisations at the forefront of employing low-technology custom-built machines. For example, MGM uses adapted road graders in mine clearance roles in Angola as part of its multi-layered mine clearance (MLC) approach. These technologies are being used because they are relatively cheap, are designed to perform specific functions (such as brush cutting), and readily supplied with spare parts. Moreover, local capacity is developed as nationals learn how to service tractors, graders and other more common machines while working with de-mining organisations.

Mine detecting dogs

In the mid-1990s many mine clearance role players treated the use of dogs with suspicion. Today these attitudes have changed drastically; MDDs are used in most mine-affected countries with relative success.

MDDs have to be trained to detect specific types of landmines, and cannot successfully detect a wide range of explosive vapours. For instance, an MDD has to be trained to identify the specific circumstances of a type of mine, its associated smell and the area conditions in which the mine is laid. MDDs trained to work in one region of a country cannot be moved to another without some re-training and acclimatisation to the new surroundings.

In the initial stages of MDD deployment, manual de-miners clear safe lanes to create boxes, usually 10m². The dogs move on a long lead within these boxes to detect the presence of landmines. Usually two or three dogs are sent through each box to verify the absence of explosives. If the dogs detect an explosive vapour, manual de-miners (with metal detectors) will be sent into the box to search for the landmines or unexploded ordnance (UXO). Once trained and acclimatised, MDDs are especially efficient in identifying the presence of landmines around houses, railways, along roads and other infrastructure. Under these conditions, MDDs are very efficient area reduction tools. Large areas can be covered faster than by manual means, as the specific locations of explosives (such as landmines or UXOs) are identified for manual clearance later.

Unfortunately dogs have very definite limitations. MDDs can work for only two or three hours before their reliability starts reducing. Weather conditions also influence their productivity, as they cannot work for long in hot weather. A dog’s ability to detect explosive vapour is also dependent upon the degree of explosive contamination in the area. If, for example, detonations have occurred in a specific box or area,
it is likely the MDD's reliability in detecting explosives in surrounding areas will be reduced, because it will receive 'mixed signals' from the residual explosive vapours. MDDs require extensive logistical support (such as dog handlers/trainers, food and water, veterinary services, and so on) that is often expensive and not readily available in post-conflict countries.

These limitations, both mechanical and canine, demonstrate the need for a multifaceted approach to mine clearance. The use of machines and MDDs as part of a toolbox approach has the potential to greatly increase cost-effectiveness and speed of clearance. The benefits of using these assets are becoming more obvious to mine clearance operators. Yet expansion of the toolbox is not merely the use of dogs and machines in support of manual de-mining; it also requires a multi-dimensional approach that precludes the inappropriate use of technology and wastage of time, energy and resources.

Lessons learned

The conference discussion identified five interrelated lessons learned from the integration of mechanical methods and MDDs into mine clearance operations in southern Africa.

First, a vital, but often overlooked, factor that will determine the cost-efficiency and effectiveness of the toolbox approach is management. Good management is necessary for any mine clearance operation. However, when machines and dogs are included, more advanced planning, monitoring and evaluation is needed from field and headquarter management.

Planning starts with the selection of the tools. Operators need to identify and understand the mine threat (types of mines and purpose of use), the environmental conditions (such as vegetation, propensity to flood, composition of soil, and so on) and the capacities of the tools. Successful operators match the strength of the tools (machine or MDD) to the conditions and nature of the mine threat at hand, and not vice versa. Filipe Muzima, Norwegian People's Aid (NPA) Mozambique, noted that operators must evaluate how the toolbox combination affects efficiency and effectiveness. The additional tools need to be matched with the current tools available. For example, how much brush can a machine clear in a day, and how many manual de-miners are needed to move behind the machines to verify that the land has been cleared? Selection of the most appropriate tool and its most optimum use will lead to better safety for de-miners and an improved clearance rate, which in turn will justify the additional money spent.

Intelligent employment of machines and MDDs does not stop with understanding the terrain or mine threat. Chris Pearce from Mine-Tech
stresses the need for flexible performance targets when using the full toolbox. For instance, brush cutters often clear ground faster than manual teams can verify the areas. Therefore, if vast tracts of vegetation are cleared in advance, by the time manual de-miners arrive the vegetation could have regrown — especially in countries such as Angola and Mozambique.

Successful management also requires sound logistical support. Without plans and procedures in place to procure and transport spares and supplies to the field, the best attempts at using the toolbox will fail.

Mine clearance operators are generally very good managers of manual de-miners. However, the integration of the toolbox requires more comprehensive planning, monitoring and evaluation. Southern African role players have learnt, sometimes the hard way (financially), that management is fundamental to the toolbox’s success.

Second, appropriate technology is needed in the toolbox. Foreign governments and donors cannot continue to promote clearly inappropriate machinery. In many cases the ‘donations’ made are useful for little more than field tests, and are relegated to the scrap yard once the contract is finished. This not only diverts the attention of the mine clearance organisation, but also wastes considerable resources on technology clearly inappropriate for humanitarian mine clearance.

In 1999 a project was tested in the northern region of Mozambique to demonstrate the detectability of minefields from the air, using remote sensing and commercially available platforms, sensors and processing equipment. The cost of the project was astronomical (some US$4.9 million), and its contribution to accelerated de-mining questionable. One project manager remarked,

...at $1,200 per hour just for the flying I think it may be something that we would like but would find difficult to fund — after all for just an hour’s flying I could support a section of de-miners for a fortnight and we know most of the mined areas without their technology.

Southern African mine clearance operators are not averse to new technology. However, too often donors present in-kind donations which have limited utility in the field, and very little sustainability once the donors discontinue their funding. Experience has shown machines need to be appropriate to the context and to specific tasks at hand, and not designed in laboratories in developed countries. Inappropriate

Due to the sensitive nature of this statement, specific donors or governments will not be mentioned. However, it is widely known in the mine clearance industry that some donors promote certain technology for political gain (domestic and international), and continue to capitalise on these by claiming them as financial contributions to humanitarian mine clearance. In Angola and Mozambique there are several abandoned ‘in-kind donations’ rusting away in scrap yards.
laboratory-driven technologies increase the reluctance of mine operators to use machines as part of the solution.

Third, sometimes the use of machines and MDDs may conflict with the initial needs of the post-conflict country. For example, following the peace agreements in Mozambique, a large number of demobilised soldiers from both FRELIMO and RENAMO were employed as deminers. While it may have been more cost-effective to use machines and dogs to support the manual de-miners, the employment of large numbers of demobilised soldiers contributed towards the peace process. This is the case for many other post-conflict countries where there is an abundance of work-seekers following the end of the hostilities.

These political aims must be balanced against the end-goal of mine clearance — reducing the threat of landmines to communities. Mine clearance cannot be seen as a long-term employment generator for post-conflict countries. If the appropriate technologies are available, they should be used to achieve the best clearance rates. This will contribute towards faster reconstruction in post-conflict countries.

Fourth, the reluctance of individual operators or organisations to share information and admit their shortcomings is detrimental to the entire industry. Greater transparency and communication can lead to improved safety regulations and better utilisation of the toolbox. The sharing of information and field experiences can save time and resources; often someone else has already solved a particular problem. MGM has been at the vanguard of sharing information on the expansion of the toolbox, and many organisations could follow their lead.

Mine clearance operators need not limit themselves to sharing only information. For example, Chris Pearce (Mine-Tech) suggests operators share mechanical assets, as is the case in Kosovo. Machines are generally under-utilised because they can be used only in limited roles. However, if operators in a region could come to an agreement on how to share costs, the benefits could be extended beyond one organisation.

Fifth, manual de-miners have to be included in the planning and management of the toolbox expansion. Manual de-miners often feel threatened by the introduction of machines and MDDs into the mine clearance process because the new assets are perceived to be replacements for them. Without proper consultation and involvement, manual de-miners often resist the expansion. Once again this is a management issue requiring a sharing of views and information. If they are able to gain the consent of their de-miners, operators can use the toolbox approach to improve the productivity of their manual de-miners as well.

Clear lessons have been learned in southern Africa. However, as Vernon Joynt from Mechem pointed out, the current toolbox can still be improved and made more productive. The technologies available do not
yet enjoy sufficient attention from mine clearance operators. The lessons learned by the various southern African role players need to be implemented by all operators to ensure optimum results.

The way forward

New technology is under development and many look forward to significantly improved detection and removal methods. Further research and design is necessary for reducing the time frame for the removal of landmines throughout the world.

Filipe Muzima wisely pointed out that mine clearance operators should be aware of several possible hindrances when considering the adoption of new technology. Organisations should not fall into the fashion trap, as ‘fads’ may result and diseconomies of scale could have serious financial implications (such as high maintenance and auxiliary costs) for operations. Similarly, despite designers’ and manufacturers’ most pressing claims, current technology will not provide any instant answers for mine clearance. Most are merely skilled salesmen, and their offers of free services are part of the sales package.

The next generation of mine clearance technology will be available in the foreseeable future. Vernon Joynt, a world authority on de-mining technologies, believes the new landmine detectors will revolutionise the industry. While he cannot give clear time frames for the innovations, Joynt believes mine clearance operators need to prepare to include the new detectors in their current toolboxes. Chris Pearce echoes these sentiments, but points out the importance of input from operators with field experience in using machines currently part of the toolbox.

Already much is being spent on the research and design of new de-mining technology. The Landmine Monitor 2000 estimates that more than US$140 million has been spent on mine clearance R&D and equipment since the early 1990s. In 1999 alone, an estimated US$40 million was spent on the hunt for new technology. The United States is the largest contributor to global research and design funding, having spent US$18.2 million in 1999. Research is currently being conducted throughout the world on ground-penetrating radar, infrared detection, electromagnetic induction, acoustic detection, nuclear radiation, chemical detection, bacteriorial detection, robotics and a wide range of

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5 Landmine Monitor 2000, Landmine Monitor: Towards a Mine-Free World (Executive Summary). New York: International Campaign to Ban Landmines, 2000, p.36. These figures are, however, not totally representative of the total research and design funding, as only a select group of donors published their funding.
vehicle approaches. Besides these seemingly traditional foci of scientific research, the use of rats, cockroaches and bees in the detection of explosive vapours for mine clearance is also being investigated.

New technology and the associated research and design should, however, not divert substantial resources from mine clearance. A balance needs to be found between research and design and the use of existing technology. Increased interaction and co-operation between the scientific community and mine clearance operators can overcome this challenge. Most southern African mine clearance operators encourage this approach, as they believe they can add considerable value to the design of the next generation of mine clearance technologies. As a result these machines will be more user-friendly and designed to meet the harsh realities of conditions in post-conflict countries.

**Conclusion**

The expansion of the toolbox requires the continuous improvement of existing technologies as well as the development of new ones. Time, energy and resources are critical on both counts. Communication and experience exchanges can contribute to these inputs, as successful methods and approaches can be transferred from one country to another (as long as adaptations are made to suit local conditions). In the next five to 10 years, better utilisation of current technology and active involvement of all role players in the development of new technology will help to bring about a significant reduction of the threat of landmines to communities throughout the world.

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Realistic Costing:  
When is it just too Cheap? 

Chris Pearce

Introduction

The mine action industry is dynamic and changing. Over the last few years Mine-Tech has noted at conferences and informally that this is a maturing industry, and one which needs to become more professional. This includes all mine action organisations, regardless of whether they are de-mining non-governmental organisations (NGOs), UN-supported mine action initiatives or commercial mine action companies.

Over the last 12 months several initiatives have taken place throughout the industry which have resulted in a number of changes, most of them positive. Today operators increasingly use multiple technologies where possible and feasible, there is a greater consciousness of the need for increased productivity and better management of limited resources, and attitudes between operators in the industry have improved. These strides forward have largely replaced the 'dog-eat-dog' mentality of the past. As with many other developing industries, mine action (and specifically mine clearance) has become more structured.

These encouraging signs have been largely driven by competition across the board. Gone are the days of easy money for mine action. There never was enough, and global funding is even tighter today. Whether it be the competition for donor funding, or for commercial funding, mine clearance operators have had to improve their costing, productivity and management to satisfy clients' insistence on getting value for money. Whilst the ultimate aim is to satisfy the 'end-client' (the communities who use the land cleared) that the end-product is safe to use, mine clearance operators now face more demanding donor or commercial clients. Just as the mine clearance industry has matured, so have those for whom they work.

In spite of these developments, greater understanding is needed between mine clearance operators and funders, donors and contracting organisations. A balance must be struck between these stakeholders' needs, objectives, expectations and abilities. This presents a challenge and perhaps a standard for these stakeholders to meet.

This assessment of realistic mine clearance costing is based on a

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1 CHRIS PEARCE is the Director of Marketing and Plans at Mine-Tech.
commercial operator's perspective. The assumptions made are not based on the activities or experiences of de-mining NGOs, although some of the assessment may apply to such operators. In general de-mining NGOs operate under vastly different funding conditions to commercial operators.

The problem

There is one undeniable reality: mine action is an expensive business. As the industry has matured and adopted a more structured approach, some costs have increased. Unfortunately, some operators continue to believe it to be an opportunity to make a fast buck. It isn't. It's a hard work and high risk business. The high risk belongs not so much to the technical sense in this instance, but to the business sense. This is where the problem, in terms of costs, lies, and the assessment that follows focuses on this area.²

A professional mine action organisation requires sound management and administration, and, more importantly, continuity. Clients who require professionalism and excellence can no longer rely upon employing quick-fix or short-cut merchants. Even organisations which amorphously form and reform when suitable contract opportunities arise are diminishing. This has been the pattern in much of the industry to date, but it is changing.

So in the face of these improvements in the mine clearance industry, where is the problem? The problem lies with the perceptions of clients and the structure of some projects. In the face of a reforming, more cost-conscious and production-oriented industry, where competition has driven costs to realistic levels while the available funding diminishes (and is channelled by specific donors), some project designs are unrealistic. This has a knock-on effect on the tender and contract process, which in turn affects mine action operations and, unfortunately in some cases, the quality of mine clearance.

The price perspective

Every mine action programme or task is different and is affected by numerous factors. The issue is not so much technical argument about comparative figures, but more about the philosophy of costing in the mine action sphere. Greater understanding is needed of the technical and management requirements, and indeed specific programme or donor

² Use of the term ‘cost’ refers to the price to the client or the overall cost of the project to the client.
requirements in mine action, and the implications these have on costs. Moreover, this includes an understanding of the applicable cost-benefit aspects achieved by employing multiple technologies within programmes. Equally important is the need to appreciate the reality that mine action operations are subject to numerous unquantifiable factors which impact on projects and ultimately their cost.

Cost is a complex subject, primarily because there are so many variables which influence the end result. In discussing the philosophy of cost, this assessment will focus on key aspects and highlight certain factors within them. The funding organisation or client needs to focus on these factors when deciding whether a cost is realistic or unrealistic. The aim of this assessment is to highlight the fact that in some instances a cost can be 'just too cheap'.

**The client/donor/funding agency's perspective**

What the client expects or wants can be unrealistic in terms of the funding available. This is probably the most controversial cost aspect of mine action operations. This spills over into the contracting arena, for it is the contract which dictates the operation and provides the document which drives the programme or project.

The most difficult situation to be in as an operator is when a client demands the lowest price with the highest possible production within a specified period. These factors are interrelated and influence each other. For example, if an operator is tasked to achieve ‘X’ amount of square metres cleared by ‘Y’ time, a certain level of productivity is required. The requisite resources or assets have to be applied to achieve the required productivity levels, and the costs have to be juggled against the time and output constraints. The operator may be tempted to revert to cutting corners, which affects the safety of the operation and, even worse, the safety of the end product. Is this what is wanted in mine action? Of course not. Does it happen? Most probably, particularly where the contractor has undercut the tender price and starts to run into trouble.

Clients' unrealistic expectations spill over into the contracting arena in many ways. For instance, penalty clauses in contracts are controversial amongst operators. Donors might insist on penalty clauses because they are price driven or, perhaps, out of sheer ignorance of what mine action operations entail. There is little excuse for the latter, since there are numerous consultants with mine action experience who can advise donors/clients. A more likely reason is that some clients/donors are still tied to a traditional approach to contract work, which is primarily cost-driven and comes with very clear specifications, with the flexibility for payment for additional work equally clearly laid down. Mine action contracts are not construction or plumbing contracts.
Specific attention is required for the implementation of mine action, where the unknown is very likely to be encountered, and where all aspects of safety must be addressed sensibly.

Below are two examples of an unrealistic client’s perspective, and the potentially dangerous consequences:

**Bosnia**

In 1997/98 the World Bank funded mine action projects in Bosnia. Tender specifications were rigid, with explicit time and productivity specifications and penalty clauses. This specific World Bank contract was for a Level 2 (Technical) Survey, and mine clearance.

Survey targets involving clearance of more than 10 mines became clearance targets — which were costed at a different, higher rate. (The initial 10 mines were extended to 30 mines in the second phase. Classic price-driven thinking!) No provision was made in the initial, first-phase tender for differing terrain categories. Since targets were not known at the time of tender and since Level 1 (General) Survey information was scanty, it was not possible for the operator to conduct a truly meaningful ‘recce’.

Mine-Tech won the tender. In the time between tender and award the terrain transformed. What had appeared as Category A terrain at the outset of the contract was now changing to Category B or C landscape — from quite open terrain to dense, and in some cases virtually impenetrable bush.

The contract was run by what would now be referred to as ‘Entity MAC’. Apart from grappling with changing terrain (vegetation), for the operator the terms of the contract became increasingly a matter of language interpretation. At the outset of the operation, when the terrain conditions were most favourable, Mine-Tech’s teams exceeded projected output quite comfortably on a monthly basis. The terms were to complete the first contract by the end of December. However, Mine-Tech was instructed not to exceed the projected output per month and regardless of the area cleared, mine clearance had to continue up to the end of December. The constraints placed upon Mine-Tech — due to the client’s perspective — ensured a very difficult work situation. Mine-Tech did not cut corners. However, the organisation was often put under unreasonable, if not intolerable pressures due to factors which were beyond the company’s control.

In the final analysis, the donor wanted a cost-effective and productive mine action operation, but the actual ‘client’ (the host country’s government) wanted to perpetuate local employment, and it was the client who controlled the contract. Given these constraints, Mine-Tech’s tender was, in retrospect, too cheap.
One of the best illustrations of the way mine clearance operators are often constrained by price-driven contracts is in the support of infrastructure reconstruction projects, especially road clearance.

Donor funding for road reconstruction and rehabilitation in post-conflict countries with landmine problems, seldom or never separates mine clearance from the actual roadworks. Hence the road contractor has to ‘allow’ for mine clearance. Since little accurate intelligence on where mines were laid on roads normally exists, the road contractor has a serious conundrum to deal with. Reconstruction of the road must include mine clearance, yet the contractor’s price has to be competitive if he is to have any hope of getting the work. Experience has shown competitive pressures generally force contractors to cut costs, and invariably the mine clearance component of the costing process is reduced most. While safety is always a concern, the contractor cannot continue to be competitive if the entire road is to be cleared. Mine clearance is sub-contracted, and almost without exception the cheapest price on offer is taken.

Generally, to be awarded a de-mining job, sub-contractors have to prove they have some form of experience in mine clearance. However, in many cases the ‘experience’ may well be limited to individuals within the mine clearance organisation, as opposed to the organisation itself. The road contractor is forced into a situation which is, quite frankly, untenable and possibly downright dangerous. The road contractor’s perspective is price-driven.

Splitting the mine clearance tender from the road reconstruction tender is undoubtedly a better option, because the present practice exposes the road contractor to high risk. Often construction companies opt for limited support from, say, an explosive ordnance disposal (EOD) team, when in fact they should be working on an already-cleared road in the first place. This is a classic situation of ‘Just Too Cheap’. It creates a conflict between International Standards for Humanitarian Mine Clearance, best practice advocated by entities controlling mine action and reconstruction aims. It exposes the road contractor to unethical commercial pressure, and it puts the mine action organisation supporting the contract into the invidious position of having to decide whether to offer at least limited support or take the moral high ground and decline to participate at all.

Not all clients or donors are unrealistic, and this assessment is not tarring everyone with the same brush. Mine-Tech’s experience with the United Nations Office for Project Services (UNOPS), for instance, has been that their contracts are very sensible, balanced, realistic and fair. The UNOPS sets time and productivity parameters that can be tempered by realism, and allows for situations where targets may
simply be unattainable due to factors beyond the operator's control, without allowing the operator the opportunity to misuse that flexibility.

The vast majority of operators do not object to having targets set for expected output, as long as reasonable leeway is allowed for real factors which may affect the output. However, if output is delineated inflexibly, and payment restricted accordingly, problems may be created unless the contract is structured to cater for contingencies. This means the contract must be based on very specific target information, and production based on the work being conducted in a timeframe relevant to the vegetation cover, expected weather conditions, ground conditions, likely mine types and mine density. Such an accommodating environment is still elusive. Unfortunately, bureaucracy usually intervenes. For instance, projects seldom or never seem to be put together in a timeframe conforming to the optimum 'season' for mine clearance.

**Tenders and evaluation**

Closely allied to client perspectives is the manner in which tenders are constructed and evaluated. The sensible, professional and (dare one say) experienced organisation putting out a tender for mine action will split the points awarded with a loading in favour of technical experience and competence as opposed to price. Certainly this is the way the UN does it. Eighty percent of points toward an award are based on the experience and competence factors, and only 20% on price. It must be realised, however, that a poor Technical Evaluation can create a situation where the points differential between technical and financial factors is so narrow that, in actuality, the financial or cost element dictates the award. The caveat is that the Technical Evaluation has to be carried out by persons who know and understand what mine action is all about. They also must know the industry and the players in it, because it is too easy for organisations to tell everyone how good they are when clearly they are not.

**Elements of costing a mine action programme**

The shortcomings of donors and funders in formulating tenders and contracts have been described. In this section, important elements affecting the costing of a mine action programme are discussed. The issues raised need to be considered seriously in any evaluation.

**Management and supervision**

Ultimately, management and supervision are the most important elements of a mine action operation. If an operation is to run smoothly,
there must be adequate staffing by experienced management personnel at all levels. Such personnel are not cheap to employ, due to the nature of the job and the fact that experienced mine action management is still in short supply.

Management levels will depend upon a number of factors. Not all of these are purely technical competence factors. The level of client reporting and interaction required can, for example, take up a great deal of a project manager's time, as can public relations issues, which are deemed important by some clients for publicity purposes. Hence the project manager may require an operations officer to ensure that day-to-day operations are run efficiently and safely. An operations officer may be needed anyway if the operation is large and widespread. There is always a requirement to conduct internal quality management (QM), and whilst it is sometimes mandated by the client (as it should be), it is an issue of staffing and hence cost. For smaller operations it is possible to have a multiple-function second-in-command who can perform the day-to-day management where the project manager is otherwise tied up, and also act as the project safety officer and head of the internal QM team. There is the issue of logistics and accounting. Some donor requirements in this area are onerous, hence a logistics manager or supervisor may be necessary. In Mine-Tech's operations, for example, it is mandatory to have a project supervisor and log assistant for any operation consisting of more than one de-mining team. A project manager is used for operations involving two or more de-mining teams.

Since every operation differs in terms of size, shape and geographical location, it is not possible to be more specific. Suffice it to say that if reductions are made in management staff and logistics support staff, there is a definite impact on the operation's efficiency, effectiveness and safety.

Operations personnel (other than management)

The cost of supplying the operations personnel required is a very variable issue and difficult to comment on, since wages and allowances can vary from theatre to theatre. The level of operational personnel must, obviously, be consistent with achieving the project goal within safety parameters and maintaining of international standards. However, the efficiency of the personnel, their training and work ethic have a direct cost impact in terms of productivity, and the ultimate per square metre cost of the project.

As an aside, in terms of project cost-efficiency, the development of local de-mining capacities must be questioned if sufficient consideration is not given to their long-term sustainability. Training local de-mining capacities for short-term contract work where donor funding is not
expected to support mine action into the long-term is questionable in terms of cost-efficiency and effectiveness. Such funding might be better directed to priority mine clearance and an effective community mine awareness programme aimed at sustainable self-management of the threat. Training local capacity is not a cheap option in that there are time and productivity implications. Short-term engagement in mine action programmes may be better handled by professionals. This is, however, not an indictment of local de-miners. Mine-Tech has trained and worked with them in several countries (e.g. Mozambique, Bosnia, Croatia, Sri Lanka and Somaliland). In spite of this, concerns must be raised about the effectiveness and real contribution short-term contract engagements (which involve local capacity building) can make towards solving the global landmine problem.

**Mine dog teams**

Mine dog teams can provide enormous benefits and cost-efficiencies, particularly in assisting with area reduction in Level 2 Surveys. As a rule of thumb, an effective mine-detecting dog (MDD) team will double or treble manual output. In terms of ratios, one MDD team to two manual teams is probably the minimum level of efficiency required in terms of cost and productivity, although that ratio can change where there is a mechanical support element.

**Mechanical support equipment**

Mine-Tech strongly supports the view that current mechanical support equipment is incapable of clearing mines to the levels expected by international standards. Mechanical support equipment has an important role to play in ground preparation, enabling faster and safer clearance by other methods. Yes, some equipment will clear some mines, even most of the mines in the right terrain conditions. But it will not clear all the mines. Presently, at least, mechanical equipment is costly to buy and relatively expensive to operate. It therefore has to be employed intelligently and correctly if it is to perform with the kind of efficiency that will make a real contribution to mine clearance.

Mine-Tech has much experience with the use of mechanical equipment, and has even developed in-house equipment. Experience has shown that such equipment needs to be employed in large-scale operations where there are adequate targets, suitable terrain and supporting manual and MDD teams to clear the ground behind the equipment. With sound planning and management, machinery can prepare targets in advance of mine clearance teams at a far greater rate/speed than the clearance which follows. The correct machinery can prepare ground at a rate six to eight times faster than a (single) manual
team can clear it, but the team would still do no more than double their manual output. Hence there is a large ‘catch-up’ factor to take into account. Even where MDD teams are used in support of manual clearance teams (MCTs), machinery can still be four times faster in its ground preparation. Therefore consideration needs to be given to employing mechanical equipment support only for the time required within the project time frame. There is little point in having an under-utilised, expensive asset for any longer than necessary. Hence there is logic in having a machine hire facility in theatres such as the Balkans, where numerous organisations are working in a relatively small area.

In Appendix A there is a theoretical example of an operation employing multiple clearance assets. Using the same base-line of a six month operation to clear 800,000m² some interesting comparisons become apparent. A manual-only operation in a six month timeframe worked out 75% more expensive than the multiple-technology approach, and required 9 x MCTs. To achieve the same clearance using combined MCTs (four) and MDD teams (two) was 15% more expensive than the manual/mechanical/MDD option, but 42% cheaper than the purely manual option.

In considering costs, mechanical support can without question introduce meaningful cost reductions, but only if employed and managed correctly. The type of machine and its track record need to be considered when assessing its value to the operation. This has to be taken into account in making a technical evaluation, and again in the financial evaluation — particularly where a contract is based on productivity (i.e. square metres to be cleared). Intelligent employment of the combined ‘toolbox’ of approaches will make an operation significantly cheaper in cost/square metres terms, and should not be dismissed as ‘just too cheap’!

**Insurance**

Insurance is an aspect which needs to be looked at very carefully in mine action. It is expensive and is an area where some might well be tempted to take short cuts. Insurance varies according to theatre of operations and levels of cover for, particularly, personnel. The best way to deal with this issue is to specify the types and levels of insurance in the tender document, so that all bidders are working on a level playing field. Insurance for mine action should cover:

- personnel insurance, including personal accident, medical and evacuation, and a rehabilitation period;
- workmen’s compensation, where applicable;
- third party liability cover;
• equipment (including MDDs, where applicable);
• vehicle/vehicle accident cover applicable in-theatre;
• any country-specific insurance cover required; and
• employer’s liability, where applicable.

In certain theatres Mine-Tech have had to take out kidnap insurance. Fortunately, however, this is not a general requirement, as it is very expensive.

**Equipment**

Equipment for mine action operations consists of capital items with a useful life (such as metal detectors, body armour, etc.), consumable items (mine-tape, detector batteries, explosives, etc.), medical equipment, camping equipment etc. In some cases the donor/client may wish for items of a capital nature to be handed over to another project, in which case the tender should include a capital budget for procurement. Alternatively, such equipment may be provided by the contractor and its cost probably amortised over a period of useful life and ‘rented’ to the project for its term.

Equipment is expensive. One metal detector will cost, delivered, in the region of $2,500. A complete set of body armour will cost in the region of $400. Then there are items such as radios, geographic positioning system, compasses, shot exploders, satellite phones, tools, etc.

**Transport**

Transport costs can be quite significant, particularly where air transport is required for personnel and equipment to and from the theatre of operations. Likewise, budgetary allowance should be made for vehicle hire in-theatre, particularly 4 x 4 hire, which is not cheap but may be vital due to local road and terrain conditions.

**Rest and refit**

Rest and refit (R&R) is a safety requirement and not a luxury. Most commercial mine action operations are based on a 6-day working week, but the 7th ‘rest day’ is not R&R. R&R may be taken locally/regionally, depending on the contract period and local conditions. In a six-month period Mine-Tech, for example, would envisage one two-week R&R period, including travel to and from the home station.
**Other costs**

Other costs to be included are items such as communications, head office support costs, management visits, finance costs, etc. Management visits are essential to any operation, and part of the professional package.

A guideline breakdown of key cost elements by percentage (%) of total price is provided in Appendix A.

**Cost impact factors**

Apart from these predictable elements which impact on mine clearance costing, there are several factors which are beyond the control of the mine clearance organisation. These factors are real, and with one exception (weather) are not of a type which could be covered by a ‘force majeure’ clause in a contract. Factors mine clearance operators have no control over are:

- **Terrain**: The terrain over which the project has to work places physical and technical demands on a project. It affects choice of vehicles and selection of techniques, tools and methodologies, and may impact on output.

- **Vegetation**: As already indicated, vegetation is a key factor when planning and implementing mine action operations. Vegetation changes according to season, which will affect output, methodologies and techniques.

- **Weather**: Extreme weather conditions lead to lost work days on operations. Weather can also impact on productivity even when work is still possible. For instance, bad weather may affect CASEVAC plans (e.g. rains prevent the use of roads). In southern Africa the onset of the rainy season brings with it the increased prevalence of malaria, which can result in a high attrition rate amongst de-miners.

- **Target information**: The less target information available, the less the contractor can plan properly where a productivity or time-driven contract situation exists. Prudence dictates that planning will be based on worst or median-case scenarios, which pushes up the tender price.

- **Density, type and age of minefields**: The type, age and density of minefields impact upon output and hence upon cost. In high density minefields where manual clearance is taking place, output rates are similar to those expected for the worst type of terrain and vegetation scenario — referred to as ‘Category C’. The presence of tripwire-activated devices also impacts on operations. Where tripwire-activated mines exist which were laid many years ago, the age factor may reduce the risk of the wires being intact, or in the case of stake-
mines, the stake being intact. In Mozambique, for example, it is rare
to find a POM-Z II which has either its stake or tripwire intact.
Appropriate target information is vital in determining the mine-
threat at hand.

- Theatre of operations environment: National rules, regulations, laws,
ethics, etc. in the theatre of operations can make an enormous
difference to the cost of operations. Certain countries enjoy dubious
reputations for making it near-impossible to operate effectively
without huge contingency factors. Added to this is a bureaucracy
which inhibits international operators, despite what the 'official
regulations' may state. Some countries also have obscure taxes for
the unwary to contend with. In fact one country has such a bad
reputation amongst the international de-mining community
(commercial at least), that it is not surprising that many operators no
longer bother to tender for work there.

Some countries should, perhaps, take note that neither donors nor
operators are unable to work out that national strategies, albeit often
unwritten or un-enunciated, are often so protectionist as to negate the
real aim of international mine action.

All these variables impact on productivity, and hence impact on unit
cost. These are the 'hidden' variables which the experienced know well
— because most have learned the hard way.

So when is it 'just too cheap'?

The short answer to this question is:

When some organisation with little or no relevant, verifiable, experience
as a mine action organisation gives a price that is so attractive that the
person(s) making the decision on the contract cannot say no to it!

This answer is unfortunately too simplistic and not the politically
correct answer. The following six criteria provide a better understanding
of when a tender is 'just too cheap'.

First, the client or donor's perspective is unrealistic. Mine action
programmes need professional input at the conceptualisation stage, or
at the proposal evaluation stage where funding is being sought. If a
professional relationship does not exist, the client/donor should get a
professional consultant. Not just any consultant is needed, but a
consultant with relevant practical experience, not only with contract
formulation, but also with experience of field operations. At the outset
of contract conceptualisation the right perspective is vital. This means
taking into account all the various aspects covered in this paper, and
probably others.

Second, the tender document is badly constructed. This means it is
based on insufficient information or unrealistic expectations. If a project is to be bound by time and productivity parameters there must be a very detailed scope of work based on accurate information. If there is not enough information, the tender should be based on a timeframe, with specified mine action assets to be deployed and targets set within reasonably flexible parameters. As the tender will inevitably form part of the contract, it is paramount that it is fair to all parties.

Third, *price is the dictating factor*, as opposed to technical competence. There must be a split between technical and financial evaluation. The technical evaluation must be carried out against criteria and a points allocation which is totally transparent and disclosed in the tender document. (That would obviate situations where patently unqualified organisations bid, or if they do bid, they do so without being in full possession of the facts — which is unfair to them because bidding is an extremely costly business).

Fourth, *critical costing elements are not addressed in the price*. Costing elements should be set out in detail in the technical proposal, which should deal with every aspect from organisation structure to techniques, outputs, quality, administration and logistics, insurance, etc.

Fifth, *the prices offered vary considerably*. This should sound a warning bell. The inexperienced operator’s tender will either come in way over the top or well below the rest of the tenders. Their price will stick out like a sore thumb. For example, if there are only three contenders and two are well-known and experienced organisations with some years in the business and the other one tenders a price way below theirs, the client should beware. The technical proposal should be re-evaluated and clients should look for the gaps. The methodology and technologies on offer (if not stipulated) should be taken into account, and weighed against the past experience and track record of the operator.

Six, *when mine action is treated like a construction project*. It is vital to remember that mine action is a very specific technical area. It should not be compared to standard technical activities based on many years of development and commercial activity such as construction. The variables are much wider, and the implications of failure are very serious.

**Conclusion**

Many donor organisations or clients have become much more professional in their approach to mine action projects over the past two or three years, but there is still room for improvement in many areas. They have learned the hard way, just as the operators have. And both parties still have a way to go. Hopefully this paper has provided a greater understanding of the operator’s perspective.
Finally, it is high time that the operators got together and started an association which carries a voice in the mine action industry that will be listened to with respect and regard for its opinions. If not, operators will continue to be subjected to the vagaries of those who know less, but have a strong voice in the international community. Operators have to cast aside commercial suspicion in pursuit of a common aim — to build a respected industry. If not, many will continue to be seen as equivalent to a plumber; someone you only employ when you really have no other choice. Mine clearance operators have to be pro-active and not reactive, and drive change instead of being driven.
Appendix A

Guideline breakdown of price

Scenario

A six month operation in the Balkans. Project value $1.8 million. The aim is to clear 800,000m².

Assets employed

- 1 x Project HQ — Project Manager, Log Manager, Storeman, Radio Operator/Clerk, Local Cooks (two), Local Drivers (three).
- 2 x MCTs — Team Leader, Medic, De-miners (two), Local Driver/Translators (two) per team.
- 2 x MDDTs — Handler plus two x MDDs per team, Local Driver/Translator.
- MST (Mechanical Support Team) — Team Leader, Driver/Operator, Mechanic, Medic, Local Driver/Translator.
- Mark-up included.

Price breakdown range

<table>
<thead>
<tr>
<th>Item</th>
<th>Remarks</th>
<th>% of total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Management and supervision</td>
<td>Project HQ element</td>
<td>7.5%–10%</td>
</tr>
<tr>
<td>2. Operations personnel</td>
<td>Including rations and uniforms</td>
<td>25%–30%</td>
</tr>
<tr>
<td>3. Mine dog teams</td>
<td></td>
<td>8%–10%</td>
</tr>
<tr>
<td>4. Mechanical support equipment</td>
<td>Three out of six project months</td>
<td>20%</td>
</tr>
<tr>
<td>5. Insurance</td>
<td>All covers</td>
<td>5%–7%</td>
</tr>
<tr>
<td>6. Equipment</td>
<td>Amortised cost</td>
<td>7.5%–7%</td>
</tr>
<tr>
<td>7. Transport</td>
<td>Including air fares and local 4 x 4 hire</td>
<td>15%</td>
</tr>
<tr>
<td>8. R &amp; R cost</td>
<td>Home travel x 1 : Expats</td>
<td>3%–4%</td>
</tr>
<tr>
<td>9. Other costs</td>
<td>See document</td>
<td>6%–8%</td>
</tr>
</tbody>
</table>
Cost Benefit Analysis and Mine Clearance

Geoff Harris

Introduction

In an ideal world, governments are concerned with maximising the present welfare of society, with due consideration for the future. For any activity in which it is involved, a government will seek to maximise the net social benefits i.e. the difference between social benefits and social costs.

These last two terms are not defined in a narrow economic context, but include all possible impacts on society, whether tangible or intangible, including whether or not they can be readily measured in monetary terms. Economists often have to be quite imaginative in devising ways of valuing goods and services which are beneficial to society even though they may not have a market price. Society is usually defined as including all individuals who are affected by that project. Some of these will be part of the project or programme, and the effects may be broadly expectable. Others will be outside the project 'boundaries', but may nonetheless benefit or suffer as a result of the project. A common example concerns the negative effects (known as externalities) of pollution on people living in the vicinity of an industrial plant.

In theory, all government decisions to allocate financial resources to projects, programmes and whole branches of government are subject to an explicit or implicit evaluation. This allows governments to rank projects, programmes or policy initiatives according to the net benefits they provide to society, typically presented as the social rate of return. The social rates of return to a range of World Bank loan projects in the 1980s and 1990s were as follows:

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1 GEOFF HARRIS is a Professor at the School of Economics and Management, University of Natal.
### Table 1: Average economic rates of return on World Bank-supported projects, 1983–92 (%)

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation and drainage</td>
<td>13</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>19</td>
</tr>
<tr>
<td>Transport</td>
<td>21</td>
</tr>
<tr>
<td>Airports</td>
<td>15</td>
</tr>
<tr>
<td>Highways</td>
<td>29</td>
</tr>
<tr>
<td>Ports</td>
<td>20</td>
</tr>
<tr>
<td>Railways</td>
<td>12</td>
</tr>
<tr>
<td>Power</td>
<td>11</td>
</tr>
<tr>
<td>Urban development</td>
<td>23</td>
</tr>
<tr>
<td>Infrastructure projects</td>
<td>16</td>
</tr>
<tr>
<td>All World Bank operations</td>
<td>15</td>
</tr>
</tbody>
</table>


A rational government, then, would evaluate all possible projects, programmes or policy initiatives and fund those with the highest social rates of return until their financial resources ran out. Such a procedure would maximize the welfare of a society and would be consistent with the imperative of getting value for money.

We know, of course, that in the real world such rationality is often the exception rather than the rule. Governments allocate resources according to habit, rules of thumb, in response to national (and sometimes international) pressure groups and election imperatives. They may not calculate rates of return and, even if they do, may not abide by their findings. Decisions to allocate resources to mine clearance are strongly influenced by sentiment. The vivid images of the destructive effects of landmines throughout the world are undoubtedly motivating factors for the funding which global mine clearance receives. However, mine clearance agencies, whether governmental or non-governmental, should be aware of the social rates of return to their activities. The aim of this paper, then, is to outline the way an economic evaluation of mine clearance should be carried out, and to discuss the results of what are arguably the only three cost benefit analyses of mine clearance carried out to date.
Cost benefit analysis

Cost benefit analysis (CBA) is an aid to government decision-making. It is used to evaluate projects and programmes where the market mechanism does not provide an adequate measure of the costs and benefits to society or the nation. Its aim is to identify and measure the gains and losses in economic welfare if the particular project in question is undertaken. This includes all benefits and costs, not only those involving cash flows, and not only those accruing to the agency undertaking the project. Thus CBA takes both a 'long view' into the future and a 'wide view' of many kinds of impacts on many kinds of people. It is necessary because ordinary financial appraisal — cash flows in versus cash flows out — do not adequately measure the impact of many activities on society as a whole.

There are four basic steps in any CBA:

• identify all the relevant costs and benefits related to the project;
• where possible, price these costs and benefits;
• discount the stream of future net benefits; and
• calculate the appropriate measure of the project's value i.e. its net present value, internal rate of return or benefit cost ratio.

The measures can then be used to answer whether any of several alternatives should be chosen, and if so, which. For theoretical reasons, net present values (the surplus of net returns over the cost of the investment) is the preferred measure.

As an illustration, consider a proposal to build a new road. The construction costs, based upon the engineering requirements of the road, are normally fairly easy to obtain. This is the investment expenditure involved, which is required over a relatively short period of time. The benefits, or returns, will come over many years into the future. In order to be able to compare the value of these returns to the cost of the initial investment, it is necessary to convert the net benefits received in each future year into present values, i.e. to discount the future net benefits. With both the investment cost and future returns in present value terms, these can be compared with each other and one or more of the measures calculated.

One of the most difficult tasks in such an exercise is valuing the benefits. In the case of a road project, savings of time and reduced accidents are likely to be important benefits. Economists have various ways of placing values on them. The saving of time to workers, for example, can be estimated by multiplying the number of work trips by the average time saved per trip and then by an average wage rate. Quantifying intangible benefits, however, poses greater challenges to economists. For instance, the psychological benefits of reduced road
accidents are not easily quantifiable in economic terms. Nevertheless, CBA is a useful tool in assessing the value of governments' social investments.

**CBA and mine clearance: General observations**

Before examining several evaluations of mine clearance, I will identify the major costs and benefits and discuss the ways in which these can be valued. The costs of mine clearance, as in most CBAs, are reasonably straightforward to calculate. The standard cost of clearance is $6,000–$7,000 per hectare although, as data in the *Landmine Monitor Report 1999*² indicate, rates can vary between clearing agencies for a range of reasons. A significant variable is the nature of the terrain. Dense vegetation, hard and rocky soil and uneven contours will substantially increase the costs of mine clearance. Other factors influencing the cost of clearance include: the use of machines and mine-detecting dogs (MDDs) in assisting manual clearance; the inclusion of development activities along with clearance and the type of personnel employed. Some contractors use expensive expatriate personnel, while others import already-trained personnel from low wage countries.

The benefits of mine clearance are often of the 'saved costs' variety and each, with the exception of immediate medical treatment, is cumulative in nature. These benefits comprise:

- the value of increased production on cleared land, less input costs;
- the value of saved lives and disabilities;
- the cost of saved medical treatment, both in the days following injury and in the long-term;
- the value of saved travelling time and reduced vehicle operating costs;
- the reduced cost of supporting refugees and the internally displaced; and
- intangible benefits including a lessening of fear, a saving of the psychological costs borne by those bereaved by, or injured by landmines.

The value of the first of these is reasonably easy to estimate, being the output produced on the cleared land multiplied by its price, less costs of production. A relatively easy way of estimating this is to use value added (effectively profit) per hectare of cleared land.

Saved lives are typically valued according to the income which would

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otherwise have been earned. A convenient figure to use is gross domestic product (GDP) per capita. Calculation of saved disabilities involves multiplying the number of saved working age people by GDP per capita, multiplied by a factor allowing for the degree of disability. Saved medical costs are based on knowledge of the types of injuries sustained and the treatment thus required. The International Committee of the Red Cross has found the medical resources required for the treatment of landmine casualties are far higher than most other conflict-related injuries.\(^3\)

The ability to use cleared roads saves travelling time and involves estimating the number of trips and average time saved and multiplying by a wage rate. Allowance may be made for the proportion of trips which involve 'work'. Shorter trips also result in lower vehicle operating costs.

Finally, insofar as mine clearance allows refugees and internally displaced people to re-settle, the costs of supporting such people in refugee camps is saved.

The intangible benefits are very difficult to quantify and are not included in the CBA. This does not deny the importance which they may have in mine-affected communities.

A final observation in this section concerns the perspective from which the evaluation occurs. Typically, CBA is done on behalf of a government. In the case of mine clearance, however, mine-affected countries' governments generally contribute very little by way of resources, with the overwhelming costs being borne by donor governments, international bodies and non-governmental organisations (NGOs). The predominant involvement of foreign governments and international aid agencies means that CBA of mine clearance has a global perspective.

### Three evaluations

**Afghanistan**

The Mine Clearance Planning Agency (MCPA) carried out a study in the late 1990s.\(^4\) This study measured the impact of mines on Afghan society and the impact of mine clearance, particularly since the establishment of the MAPA (the UN Mine Action Programme for Afghanistan) in 1988. The Afghan mine clearance programme is the oldest internationally


funded operation to date. Since 1990, more than 166 square kilometres of the estimated 859 square kilometres of mined land has been cleared.

The main benefits from mine clearance and the estimated annual benefits currently resulting from the cleared 166 square km of land (5,513 minefields) is illustrated in Table 2. The estimate of total annual benefits is $94.1 million. It should, however, be noted that the report is inconsistent on a number of points. Accordingly, a number of values have been recalculated (transport benefits in particular) from data presented in the report, and a fuller range of benefits included (savings as a result of fewer casualties in particular).

The estimates contained in Table 2 can be used to carry out a CBA of mine clearance, although the MCPA report does not do this. Several indications of costs are included in the report:

- clearance costs are some $6 per square metre;\(^5\)
- $114 million was spent between 1990 and 1997 by the UN on mine action operations;\(^6\) and
- the annual cost of the operations is estimated to be $20–$25 million.\(^7\)

The first of these implies a cost of $99.6 million (i.e. $6 per square metre multiplied by 166 square kilometres) in current values for the area cleared since 1988. This figure seems reasonably consistent with the other two figures. An unknown part of the second would have been spent on mine action activities not specifically linked to clearance, and the third current figure is probably considerably higher than expenditure in the early years of MCPA.

An investment of $100 million over 10 years, then, seems to be leading to an annual return of $94.1 million. However, several of these data are not in a form appropriate for the estimation of the social benefits of mine clearance. In particular, the agricultural benefit of mine clearance needs to take costs of production into account. That is, it is profit or value added rather than value of production per se which is the appropriate figure to include in the CBA. Value added figures for Afghanistan are not available. If we use the agricultural value added per hectare for Pakistan — $382 in 1992–94\(^8\) — to the agricultural and grazing cleared (11,360 ha), the agricultural benefit becomes $4.3 million compared to the $48.1 million suggested in Table 2. This reduces total annual benefits to $50.3 million per annum.

\(^5\) Ibid., p.4.
\(^6\) Ibid., p.1.
\(^7\) ICBL, op. cit., p.3.
Table 2: Annual benefits of mine clearance in Afghanistan, late 1990s ($USm)

<table>
<thead>
<tr>
<th></th>
<th>Value of increased grain production</th>
<th>3.2&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>Value of increased dairy production</td>
<td>32.8&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Value of increased meat production</td>
<td>12.1&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Transport</td>
<td>Value of reduced travel time</td>
<td>1.8&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Value of reduced fares</td>
<td>12.6&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td>Casualties</td>
<td>Value of saved lives</td>
<td>0.7&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Value of saved disabilities</td>
<td>0.8&lt;sup&gt;7&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Value of saved medical costs</td>
<td>5.5&lt;sup&gt;8&lt;/sup&gt;</td>
</tr>
<tr>
<td>Refugees</td>
<td>Value of reduced refugee numbers</td>
<td>24.6&lt;sup&gt;9&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Source: Derived from MCPA, op. cit., various pages.

Notes:
1. 63 square km agricultural land cleared x 230 MT per ha x $220 per MT.
2. 51 square km of grazing land cleared supports 83,500 cows and 155,400 goats, resulting in 83 million litres of milk at $0.40 per litre.
3. 40% of 83,500 cows x $250 each and 60% 155,400 goats valued x $40 each. This assumes that the cost of livestock (p.30) relates to their value as meat, as is implied elsewhere (p.3).
4. 93,161 passenger journeys per day saving 0.85 hours per journey x 240 days, 8 hours x $1.50 earnings per day x 0.50 (non-worker passengers).
5. 93,161 passenger journeys per day saving $0.37 per journey x 365 days.
6. 1,265 deaths saved per annum x 365 days x $1.50 per day.
7. 2,750 injuries saved per annum x 365 days x $1.5 per day x 0.5 (assumed reduction in productivity).
8. 2,750 injuries saved x 0.576 (proportion involving amputation or other severe injuries) x $3500 per casualty.
9. 479,000 refugees returned to cleared houses x $51.3 (the minimum annual cost of supporting an individual in a refugee camp).

The evaluation is set up in the following way:
- the objective is to measure the effects of the clearance undertaken between 1988 and 1998 at a cost of $100 million in present values;
whilst benefits from clearance would have commenced immediately, we do not know their dimensions until 10 years after clearance began. We make the simplifying assumptions that benefits commence in 1999 and use the end of 2008 as the cut-off for their measurement;

- the returns are cumulative, e.g. the 1999 returns are $51.3 million, while those for 2000 are $51.3 million plus $45.8 million, the last figure being the ongoing 1999 benefit of $51.3 million minus the immediate medical costs saved; and

- the fact that returns are counted to the end of 2008 means that returns arising in subsequent years contribute less, e.g. those of the year 2000 earn $51.3 million plus eight further years of $45.8 million, whilst those of 2005 earn $51.3 million plus three further years.

The results of the evaluation, using three different discount rates (see Table 3), indicate net present values (NPVs) of between $935 million and $1,744 million. These figures are very high considering that the cost of investment includes all mine action activities (i.e. mine awareness, victim assistance, etc.) and not only mine clearance. The sole use of mine clearance figures would increase the value of returns.

From these positive results, one can assume donors and funders are justified in continuing their social investments in Afghani mine clearance.

<p>| Table 3: Net present values of returns from mine clearance 1999-2008 ($million) |
|-------------------------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Discount Rate (%)</th>
<th>Net present value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1,744.0</td>
</tr>
<tr>
<td>10</td>
<td>1,265.4</td>
</tr>
<tr>
<td>15</td>
<td>935.2</td>
</tr>
</tbody>
</table>

Cambodia and Mozambique

CBA studies of mine clearance in Cambodia9 and Mozambique10 have also been completed. Both began by estimating the costs of clearance based on the estimated area of contaminated land, and this investment was then compared with estimated benefits occurring in the future. The

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results of these two studies are summarised in Table 4. In brief, they indicate that future mine clearance has a very high negative net present value (i.e. that it is not worthwhile in terms of the resources involved).

The results are unequivocal: the data would have to be changed by fantastic amounts to result in positive NPVs. This raises the question, 'why does mine clearance in Afghanistan result in such high positive NPVs, whilst the Cambodian and Mozambican studies show negative NPVs?'

Four reasons may be suggested. First, the clearance costs used for Afghanistan are relatively low. Second, two benefit items — transport and refugees — which make up 77.5% of Afghanistan's benefit from clearance, were not included in the Cambodian and Mozambican studies. Third, the use of average wage rate for Afghanistan results in a far higher earnings figure than the use of GDP per capita in the Cambodia and Mozambique studies. Fourth, Mozambique has dollar terms with very low casualty figures.

### Table 4: Annual benefits, clearance costs and NPVs for Cambodia and Mozambique($)

<table>
<thead>
<tr>
<th>Benefits of one year of clearance</th>
<th>Cambodia*</th>
<th>Mozambique#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lives saved</td>
<td>128,640</td>
<td>4,200</td>
</tr>
<tr>
<td>Disabilities saved</td>
<td>64,320</td>
<td>7,000</td>
</tr>
<tr>
<td>Medical costs saved</td>
<td>26,400</td>
<td>500,000</td>
</tr>
<tr>
<td>Increased agricultural output</td>
<td>137,600</td>
<td>61,020</td>
</tr>
<tr>
<td>Total</td>
<td>455,600</td>
<td>572,220</td>
</tr>
<tr>
<td>Clearance costs per annum</td>
<td>22,000,000</td>
<td>3,140,000</td>
</tr>
<tr>
<td>Net present value</td>
<td>-210,400,000</td>
<td>-28,228,400</td>
</tr>
</tbody>
</table>

Sources: Harris G, op. cit.; Elliot G & G Harris, op. cit.

Notes:
- Assumption set II (Harris G, op. cit., pp.221–222) assumes mines are cleared over 25 years, with benefits evaluated over 10 years and NPVs calculated using a 10% discount rate.
- Assumes mines are cleared over 10 years. Benefit figures apply to the situation where all mines are cleared. NPV calculated using a 10% discount rate.

### Discussion and conclusion

Many mine action stakeholders are likely to object to the evaluation of mine clearance in such a manner. Several responses may be made.
First, the economist's input will be one of a number of inputs and considerations, which will be taken into account as resource allocation decisions are being made. CBAs are not conclusive; rather, they are an aid to decision-making. Individual CBAs for specific organisations (e.g. Mines Advisory Group, Hazardous Life Support Operations, Menschen Gegen Minen, etc.) with strong developmental qualities could provide better, if not positive, NPVs.

Second, the results of these CBAs may give emphasis to the need to find a technological breakthrough to reduce the costs of clearance to a fraction of the current $6,000–$7,000 per hectare. Such a breakthrough has proved very difficult thus far in the terrain and vegetation environments in which mines are laid in Mozambique and Cambodia. The increased integration of MDDs and machines into the de-miner's toolbox is, however, likely to reduce the costs of clearance through substantial gains in productivity. Notwithstanding these productivity gains, without a technological 'silver bullet' there may be no alternative to the highly labour-intensive methods currently used.

Third, CBA highlights the need for prioritisation of tasks in mine-affected areas. Higher returns can be earned from some mine action activities and lower returns from others. Better prioritisation will improve the returns to investment in mine clearance and will thus benefit vulnerable communities the most.

Fourth, government resource allocation is about getting the best return from social investments. The welfare of Mozambicans, for example, would almost certainly be increased by allocating resources to other areas. The UNDP reports the following for the late 1990s:\footnote{UNDP Report, 1999.}

- 43% of one-year olds are not immunised against measles and 22% are not immunised against tuberculosis;
- the infant mortality rate in 1997 is 130 per 1000 live births, and the under-five mortality rate is 208;
- 60% of adults are illiterate;
- 40% of primary school age children and 22% of secondary school age children attend school; and
- 37% of the population has access to safe water and 70% to health services.

The cost of saving and enhancing lives in areas such as these is almost certainly far less than the cost of those lives that are saved through mine clearance. For instance, global financial support for malaria control in Africa is estimated to be not more than $70m per annum for a disease that annually claims more than two million African
lives.\textsuperscript{12} There is a case for a reallocation of funds from mine clearance to areas such as malaria control.

Finally, if mine clearance is so socially unprofitable, how is it that large amounts have been invested in it so far? Two possible answers may be suggested. First, landmine clearance is very largely aid-funded, and donor governments and their societies are likely to value life by the levels of income prevailing in their own countries. (The fact that the Mozambican government allocates very little to mine clearance\textsuperscript{13} suggests that they have arrived at similar conclusions to those reached in this article.) A second explanation relates to the distinction drawn by peace theorists\textsuperscript{14} between physical violence and structural violence. The latter refers to those structures which maintain the dominance of one group at the centre of power over another group, often a majority, at the periphery. At a practical level for those at the periphery, structural violence can mean low wages, landlessness, illiteracy, poor health, limited or non-existent political representation or legal rights and, in general, limited control over most aspects of their lives. It is a quiet violence which, without intending to harm people, nonetheless results in many casualties. The fact is that citizens of developing countries are far more likely to die as a result of preventable disease and malnutrition than as a result of war.\textsuperscript{15} The quietness of the former deaths, however, means that they attract much less attention from aid donors.

\textsuperscript{12} Sachs J, 'A new map of the world', \textit{The Economist}, 24 June 2000.

\textsuperscript{13} ICBL, \textit{op. cit.}, p.50.


\textsuperscript{15} UNDP, \textit{op. cit.}, p.50.
Using Socio-economic Indicators: Illustrations from Mozambique

Ananda S Millard

Introduction

De-mining as part of Transformative Reconstruction Humanitarian Mine Action (HMA) is currently undergoing considerable changes in an attempt to address newly identified needs and to generally improve the way in which operations are conducted. The focus of this paper is on community studies as one approach to improve the way HMA is conducted.

The terminology defining the stage that follows the end of an armed conflict has long been under debate. This paper proposes that this terminology reflect that we must not only aim to reconstruct the country, but to do so in a manner that is forward-looking and visionary. The term ‘reconstruction’ alone can lead to the unvisionary re-establishment of the pre-war state. Henceforth, the term ‘transformative reconstruction’, which calls for a critical re-examination of the current goals and practices of humanitarian endeavours, should be adopted.

The principal aim of de-mining must be to contribute constructively to the rebuilding of a country that has been ravaged by armed conflict. This rebuilding should be ‘transformative’, so the general aim of de-mining should be to find a way of aiding the transformative reconstruction effort in any given country. This paper will examine how this goal may be achieved at the community level.

Constraints in prioritisation: Moving ahead

It is often argued that attaching much importance to the socio-economic aspects of de-mining operations shows a disregard for the numerous constraints facing operators in the field. It should be stressed here that the focus on socio-economic impact (generally or at community level) is...
not intended to deny the importance of other relevant issues, but to put
forward the claim that the socio-economic implications of de-mining at
community level are equally important.

Moreover, it should be stressed that the constraints faced by de-
mining operations are, for the most part, issues that can be dealt with.
Constraints should not dictate the way in which operators conduct their
work at the expense of the intended beneficiaries, who should always
remain the principal priority. This is, after all, the fundamental basis of
humanitarian endeavours.

The principal types of constraint faced by de-mining operations are
organisational, natural and political. Organisational constraints include
issues such as organisational resources relevant to particular tasks and
funding. Available equipment needs to match the scope and type of task.
Also not only is the overall amount of available funding an issue, but it
has often been the case that donors effectively block priority-setting
discussion by tying funding opportunities to specific programmes or
geographic areas. Natural constraints refer particularly to climatic
conditions and logistical operations such as evacuation methods,
condition of roads, and so forth. Political constraints refer to the political
sensitivity of conducting tasks and the security of operators. HMA
agencies need to have confidence that their personnel will be secure in
the area; in particular that they will not be attacked by armed parties.

While these are all real constraints that may hinder the
implementation of a given operation, it should be emphasised that these
issues should not be classed with socio-economic indicators in the
prioritisation process.

Moreover, it is important to stress that constraints change, so that
operators need to monitor the shift in circumstances. There is a level of
uncertainty in all work of this kind, the recent floods in Mozambique
being one such example. This may mean that an operation which was
logistically impossible before, can become possible; and vice versa. It
may also be noted that a less successful operation is not necessarily a
demonstration of operational failure — the cause could have been both
unpredictable and beyond the control of the operator.

A continuum: Emergency and development

Most post-war reconstruction debates are characterised by a basic
assumption that there will be a short emergency stage, and, if this phase
is successful, that it can be followed by a move towards a developmental
stage. In the latter, both the priorities and the means of fulfilling the
goals of the task alter.

While the post-war reconstruction debate is differentiated into these
two stages, it is important to stress that these alternatives are neither
mutually exclusive nor extremes on a continuous scale. Essentially, most priorities and operations fall somewhere in-between. There are several reasons for this.

First, and perhaps most important, we have now learned that emergency initiatives that do not look beyond the most immediate timeframe are rarely successful. Reasons for their failure include inability to solve the original problem, which often leads to negative side effects such as aid dependency. Second, the idea that every part of a whole country or region is at the same stage in the post-war period hampers any attempt to adapt projects to local communities. The use of an inflexible approach places severe strain on any given operation, because it fails to address the local needs and to recognise the capacities of the community being assisted. Third, there is no assurance that a place that has gone through the emergency stage will not return to it, as has unfortunately been the case in Mozambique due to the recent flooding.

Whilst it seems that the logic used to define stages has largely dictated the priority-setting in HMA and in Mozambique in particular, these stages will be used in this analysis as reference points only. The Assistance to Mine-Affected Communities (AMAC) project has chosen to assume three stages as reference points for discussion, with emergency and development at the extremes and a transition stage in the middle.

Table 1 below serves to illustrate what is encompassed by these stages:

<table>
<thead>
<tr>
<th>Table 1: Priority setting by stage of post-war reconstruction</th>
</tr>
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<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Overall objective</td>
</tr>
<tr>
<td>Main impact by level</td>
</tr>
<tr>
<td>Accident potential</td>
</tr>
<tr>
<td>Impact identification</td>
</tr>
</tbody>
</table>

This implies that Stage 1 priority setting requires the least understanding of the local community. Priority setting in this stage is,
first and foremost, a response to the high accident potential. An example would be the case of an area used by displaced people unfamiliar with the mine history of that area. Such tasks may have high impact at the national level (macro-level impact), but do not necessarily take communities' specific needs into account.

Stage 2 priority setting identifies short-term developmental capacity as the primary benefit of de-mining an area. The accident potential is significantly lower than at the emergency stage. For example, people know roughly where the mines are and will try to refrain from using a mined area, but accidents may still occur. In this stage the primary impact of de-mining tends to be at the regional level, and is linked to other developmental projects that are being supported by other organisations or institutions — for example, the building of a school or hospital in the area being de-mined.

Stage 3 priority setting is oriented towards long-term development and is dependent on a broader understanding of communities. Selected tasks have minimal or no accident potential because the people in the area know where the mines are and have developed ways to cope without using the mined areas. These tasks have a micro-level impact only — the impact of the operation is basically limited to people in the immediate vicinity of the mined area. The difficulty in identifying socio-economic impact does not, however, mean that there is no such impact. Here, one is confronted directly by the inadequacy of information that relies solely on technical surveys of the minefield. What is needed is a broader understanding of the human dynamics of the area.

Stage 1 priorities have the potential to have a significant impact on the effectiveness of Stage 2 and Stage 3. In any operation, the positive impact will be increased if the operation works with the community. Additionally, the potential for a negative impact, relative to the overall impact, is minimal at Stage 1, increases at Stage 2 and is largest at Stage 3. While priorities at Stage 1 will always take precedence over priorities at Stage 3, as they should, the potential for beneficial impact of a Stage 1 priority is always higher than can be forecast.

**Focusing on community: How do we identify impact?**

Identifying impact at community level might be one of the most difficult challenges faced by de-mining. This paper will not focus on the methodological issues surrounding the identification of socio-economic indicators at community level, but rather on why it is important that they should be marked.

Identifying the socio-economic situation at community level requires that we move beyond traditional macro level impact identification (like power lines and water lines) and the most obvious types of micro impact
Beyond De-mining

(such as access to water and village paths). We need to try to understand the community in order to be able to identify the less evident issues that will determine the eventual impact of the de-mining operation. Trying to identify these less obvious and visible types of indicator requires that we focus on the community level and that we understand the community as a unit, separate from larger national mine action efforts. Communities are not homogenous; nor are they simple structures. The socio-economic impact of mine clearance will not be linked to one issue alone, but rather is likely to be the result of a number of complex intermingled issues, needs and capacities at community level.

Community studies involve trying to understand how the community operates, what its needs are and how we may best assist their fulfilment. In order to understand a community, mine clearance operators need to do more than identify a handful of key informants, as is done during initial surveying endeavours. Moreover, it is during community studies that we can best understand how the operation itself can be conducted in order to maximise its potential success. Issues such as points of contact within the village and hierarchical structures are important, and may provide the key to community confidence in the operation.

While we attempt to identify the way in which any given community may be best served and what type of indicators exist, it is also important to prevent ourselves from using the data to support preconceived ideas. For example, the presence of mines surrounding a factory may or may not be the determining factor in the re-opening of that factory. We need to keep in mind that whilst mines do pose a treat and hindrance to a number of development and reconstructive efforts, they are most often not the only factor to consider. Additionally, mines should never be assumed to have an impact simply because they are present.

Identifying socio-economic indicators at community level is not an endeavour that can be responded to with a checklist of issues. At the initial stages of prioritisation, a list of general issues may be drawn up, but these indicators need to be narrowed down and contextualised during the implementation of community studies, which, unlike short surveys, are able to identify the more complex issue, which will determine the socio-economic impact of de-mining operations.

Moreover, socio-economic indicators do not necessarily respond to all the ways in which any given operation may impact on a community socially and economically. Conducting community case studies will also enable the operator to maximise the operation's impact.

Maximising impact

The dominant concept used to address the challenge of building
infrastructure, institutions and communities after war is 'reconstruction'. The term 'reconstruction' indicates that there is a wish to rebuild what existed in the past. Rebuilding the past is anything but a sensible objective, and hence there is a need for a different vision. What is required is 'transformative reconstruction', the post-conflict building of a country in a way which aims at maximising that country's potential for growth.

As far as HMA operations are concerned, maximising impact refers to the idea that in addition to simply fulfilling the original goal of the demining task, operators can strive to conduct operations which have an impact that goes well beyond this. For example, while mine clearance around a power line has a macro level impact (national or regional), the fulfilment of this task does not preclude the local community's reaping additional benefit from the de-mining operation. In this case the focus on the community could ensure that the operation goes beyond its original goal and maximises impact.

Illustrating this point is the mine clearance operation launched in the northern Mozambican town of Nacala. The aim of the operation is to demine eight kilometres of water pipeline, which is the only source of fresh water to the port city. This operation's primary impact is at the macro level. However, the area where the minefield lies is populated, hence the operation will also have a micro-level impact. In this case the operator has concentrated on the macro impact, largely disregarding the effects on local residents. While locals have developed alternatives, such as new areas for cultivation or for the production of coal, the failure to factor in local impact represents considerable lost opportunities to maximise impact.

Maximising impact, however, is contingent on understanding community needs. The fundamental idea is the ability to improve the agency's understanding of socio-economic impact, hand in hand with building strong relationships with the community. It is important to understand how the resources freed up by de-mining will affect the distribution of wealth and of power among the population affected by mines. Land ownership is an important theme in most clearance operations. It is AMAC's experience that operators rarely establish knowledge of land ownership prior to clearance. This does not always lead to problems. However, the question of land rights is a staple issue and one that can lead to disputes; hence any agency entering the local scene to free up resources needs to have a basic knowledge of local land tenure systems.

For instance, a recent mine clearance operation in Bandua in the Sofala province did not take into account the potential of land rights as a source of communal conflict. No-one knew who the de-mined land belonged to, and what would occur once the land was handed over.
Moreover, a common perception in many mine-affected communities is that the land being freed is agriculturally rich and thus attractive. Therefore it is not inconceivable that strong community actors will take advantage of their positions to establish ownership over cleared land. This is yet another reason why community level impact should be carefully examined.

**Operators and community studies**

Most humanitarian mine clearance operators may not have the capacity or the tools to conduct community studies. This is not a reason to disregard the importance of this type of study. Not only would community studies strongly contribute to the success of de-mining operations, but they would refine the tools by which success is measured.

There are two issues to consider when evaluating the cost-benefit of conducting community studies. First, operators need to demonstrate to donors that the work they conduct has a positive impact. Whilst in the past the number of mines removed, or the reduction in the number of accidents that took place in the area was sufficient motivation, this is no longer the case. The irrelevance of using number of victims as an indicator is particularly true in Mozambique where the number of accidents has drastically decreased in the post-war years. From this perspective, community studies offer a way of responding to the needs of donors.

Second, while community studies can be accused of being time-consuming and requiring specially trained staff, the risk of conducting operations where the impact is minimal or non-existent, or where the negative effects of the operation are high, threatens to undermine the essential purpose of humanitarian mine action.

**Conclusion**

In order to identify the socio-economic impact at community level we need to understand the communities where we work. The level of understanding required necessitates conducting community studies. Moreover, once the area is understood more closely, the chances of success of the operation and the overall impact can be greatly improved.
Responding to Community Needs:
The Mine Action Team Approach

Steve Johnson

Introduction

The Mines Advisory Group (MAG) is a UK-based mine action group. Its first involvement in Angola started during the period of peace in 1992, when a country-wide mine awareness campaign was launched in conjunction with the United Nations Children’s Fund (UNICEF). In 1993 MAG conducted an impact assessment of the mine situation and established a programme in Moxico province, one of the most seriously affected areas in Angola. By the end of the year a 33-person de-mining team and a mine awareness team had been trained and deployed.

During 1994 and 1995 MAG’s work focused on making land safe for cultivation and securing access for people to collect water and gather firewood. By December 1995 the programme had grown to four 33-person de-mining teams and two nine-person survey/demarcation teams. Additional operations bases were established in Lumege (a UNITA controlled area) and Luau in 1996 and 1997 respectively. Mine awareness programmes were also established in Zambia and the then Zaire to work with the Angolan refugees living there.

In early 1998, due to the worsening security situation across the country, which was bordering on open warfare, the UN’s planned repatriation of refugees was postponed. Tension in the Moxico province also increased, and in June 1998 a strategic town close to Luau was attacked and overrun by UNITA. The continued UNITA advance towards Luena inhibited MAG from carrying out operations outside the city. During July all de-mining operations were suspended. However, MAG continued to provide an emergency response team, as well as conducting frequent minefield rescues and giving de-mining support to UN convoys. By early August 1998 it had become impossible for MAG to operate effectively in the area, and it decided to suspend the programme.

MAG felt it essential to maintain a presence in Angola, and so began looking for another area in the country suitable for the establishment of a new programme. In January 1998 MAG established an operations

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base in Ondjiva, Cunene Province, in the south of the country. After recruiting and training personnel from the local population, MAG deployed the first two Mine Action Teams in April 1999.

The Mine Action Team: A brief history

Humanitarian de-mining is constantly evolving, with new technologies and techniques being introduced in an effort to maximise the benefits for conflict-affected communities. MAG believes that the way mine action is implemented should also be constantly examined and reviewed. A major development that has evolved out of MAG's programmes is the concept of the Mine Action Team (MAT).

The way in which MAG implements mine action in its programmes has undergone several developments over the last eight years. It soon discovered that concentrating MAG's limited resources on large clearance teams working to de-mine all the land was not the most efficient way of addressing affected communities' immediate needs. A faster and more flexible response was required.

In northern Iraq, field experience had led MAG to combine mine clearance and explosive ordnance disposal (EOD) personnel into Combined Operational Response (COR) Teams. These teams were able to respond quickly to the initial recommendations of Advance Teams, and could deal with the small-scale but pressing tasks that communities identified as addressing their immediate needs. COR Teams provided an efficient deployment of resources, and their quick response to the reports gathered by the Advance Teams helped build good relationships between MAG and local communities.

Similarly, in Lao, People's Democratic Republic (PDR) Roving Teams were developed to use the information gathered during Community Awareness Team visits to a village. Roving Teams would often be called upon to respond to emergency tasks, such as where people uncover items of ordnance while building houses or establishing gardens. Their ability to respond fast to deal with whatever particular problem a community faced was achieved by integrating various skills into one team. These were characteristics that MAG was keen to develop.

In Angola MAG began to explore the concept of a team that would combine different mine action skills and develop a symbiotic relationship with the affected community. This process was driven by the need to offer a tangible response to each community's identified priorities.

In April 1996 MAG began trying out a multi-skilled team in its programme in Luena, which combined de-mining, mine awareness and EOD skills in one mobile unit. It proved so successful that it was quickly utilised across Angola, working in tandem with larger de-mining teams.
When MAG relocated to Cunene Province, it elected to train and deploy only MATs.

Combining skills

A MAT combines all the skills needed for effective humanitarian mine action in one mobile, flexible unit. The integrated team assembles eight de-miners, two Community Liaison Officers, a medic and a driver. Field management is provided by the team leader and a de-mining section leader. MAT’s integrated approach is important because of the scale of the landmine and unexploded ordnance (UXO) problems in many of the areas where MAG works.

Community liaison

MAG Community Liaison staff work closely with affected communities to gather information and establish priorities for mine and UXO clearance. They help determine the appropriate intervention by analysing this information and continually liaising with the community. Throughout this process the Community Liaison staff communicate mine awareness messages, helping people to live more safely in a dangerous environment. The team also identifies broader development needs, and reports these to the appropriate authorities or agency if MAG itself is unable to offer a solution.

Survey/demarcation

Survey and demarcation work focuses on reducing the size of areas suspected of being mined by identifying the minefield perimeter, which is established by breaching lanes into the suspected area. The minefield is then clearly marked using mine signs and tape, and is subsequently rated for clearance on a scale of priorities.

De-mining

De-miners work in pairs, with one clearing using a detector (No. 1), and one observing at a safe distance to ensure safety and correct adherence to drills and procedures (No. 2). The de-miners change places every half hour, and have regular rest periods.

Explosive ordnance disposal

EOD ranges from destroying sensitive items in situ to removing them
for later detonation. UXO includes items such as small calibre bullets, grenades, mortars, cluster bomb sub-munitions and large air-dropped bombs.

Using the MAT concept has allowed MAG to overcome two common problems that face conventional mine action.

First, communities that have been visited by mine awareness and/or survey teams several times over a long period without any de-mining taking place can become disillusioned. Furthermore, mine awareness messages can become ineffective as people are forced to continue unsafe practices out of economic necessity. Most mine victims are aware they are in a minefield at the time of the accident.

Second, difficulty can arise when communities report small problems, such as a single mine or piece of UXO, to a data gathering or mine awareness team. Because these single-discipline teams are not multi-skilled, the community may have to wait some time before technicians come and deal with the item and check the surrounding area.

**Initial deployment: Deciding where to start**

MAG’s usual starting point for operations is based on the ‘Bad Honnef’ principle of participation which states that — ‘The needs of the community are the starting point for humanitarian intervention and activity, not the desire of donors or leaders of an organisation.’

For MAG this starting point is usually based on one or all of the following:

- requests from local government where these coincide with humanitarian action (no helipads for hind gunships);
- NGO information and needs such as wells, food distribution, internally displaced persons (IDP) resettlement;
- survey information and accident statistics; and
- military history, as when the study of SADF activity in Cunene helped identify cut-off areas.

By utilising the MAT concept, MAG enables communities to gain secure access to water, land and other resources quickly. People are therefore able to live more safely in a dangerous environment until all the mines and UXO can be dealt with. A further advantage of the MAT is its flexible structure. It can be split into smaller teams or combined with other MATs to create a larger clearance capacity. This allows MAG to address a wide variety of mine and UXO clearance tasks in the most appropriate and effective way.

As communities see their problems with explosive items being dealt with, they are encouraged to come forward with further information. Once MAG has performed a detonation the sound of the explosion often
results in other members of the community reporting mines or items of UXO that they know about.

By working closely with and listening to people, the MAT builds up a relationship of trust with a particular village or community. The MAT and the community work towards making a mined environment safer for people to live in, rather than simply clearing a defined area of mined land. The MAT spends time learning about the problems that the community faces, and working out appropriate solutions. The MAT is integrated in its form and participatory in its methodology.

**Community liaison in Angola**

The people with the best knowledge of mine and UXO problems are to be found within the affected communities. MAG and individual communities jointly determine needs, and together prioritise the order in which the work is to be done. In doing so, MAG and the community also consider possible assistance in addition to mine awareness and clearance, such as rehabilitation of water points or health infrastructure. This essential part of the mine action process is known as Community Liaison. Each MAT has a male and a female Community Liaison Officer. These officers are trained in participatory techniques and act as MAG’s first contact with the community.

When MAG first becomes involved with a village or a community, an initial visit is made to introduce MAG and the team to community leaders. MAG’s aims and objectives are explained and a community meeting is arranged. These meetings are held in the local language, which enables all members of the community to participate and also helps to establish trust.

Following introductions and an initial discussion, the MAG team asks the community to split into three groups — men, women and children, because each group generally has different knowledge, attitudes and priorities. Also, in some areas, women and children are more willing to speak when the elders or men are absent. Each group creates a map of the area and indicates items or places they know or believe to be dangerous. When the information has been collected within each group, the whole community comes together and makes a large map that collates each individual group’s information. The MAT works with the villagers to discuss their needs and to identify the most important tasks. Through this process MAG’s work in the community is prioritised according to the wishes of the villagers themselves.

Technical intervention usually begins within a week of the community meeting. The form this intervention takes depends on the needs of the community. Mine awareness messages might play a dominant role, as may survey and demarcation or actual mine clearance.
and EOD. The MAT is multi-skilled and thus able to implement the most appropriate response.

Although MAG's primary focus is humanitarian mine action, other diverse needs within the community are discussed. Wherever possible, MAG will assist directly or, if this is not possible, alert local authorities or other NGOs. For example, a community that MAG visited was concerned that the village had been overlooked during a polio vaccination campaign. MAG informed the health authorities and the children were later visited and received their vaccinations.

MAG is also able to assist actively in the rehabilitation of health, water and other services identified and prioritised by communities. This is achieved both through MAG's own engineering, medical and other skills and by working in partnership with relevant agencies active in the region.

**Working with other agencies**

In Cunene Province MAG has been working closely with AICH, a Spanish NGO involved in the rehabilitation of water wells across the province. MAG's first task in Cunene was to clear an access route and work area to give an AICH drilling rig access to an old well located in a mined area. MAG has since cleared another four well sites and continues to work closely with AICH.

MAG has developed a successful relationship with the International Federation of the Red Cross (IFRC), which currently runs a mine awareness programme in the province. A system has been developed whereby all reports of mines and UXO gathered by IFRC field staff are forwarded to MAG. Once MAG has dealt with the item it reports back to the IFRC, detailing what action has been taken.

Not only has this relationship added to MAG's ability to gather data and information on the extent of the problem in the region, it has also greatly enhanced the IFRC's programme. Prior to this, communities did not always report dangerous items, as they felt nothing would be done.

MAG has also assisted with the World Health Organisation's polio vaccination campaign in the province by providing vehicles, radios and medical personnel over weekends, so as not to disrupt ongoing operations.

MAG actively seeks to develop relationships with partner agencies wherever it works. Combining knowledge and skills in this way is a recognised part of the 'Bad Honnef Framework'. This framework, which owes much to German NGOs such as Medico International and the German Initiative to Ban Landmines, is an international accord that integrates and co-ordinates mine action with other development activities.
Looking to the future

MAG's programme in Angola has faced many difficulties, including fluctuating security concerns. Despite some donors' reluctance to fund humanitarian programmes in Angola, MAG has succeeded in developing mine action to a point where, in many ways, it has provided a model for all MAG's programmes in other countries.

MAG's mine action programmes aim to contribute to permanent change. They must integrate emergency relief with long-term development, in line with the 'Bad Honnef' principles on Coherence. Accordingly, MAG maintains its links with a community following clearance in order to help bring about a successful future for the community. The Community Liaison role grows stronger as the organisation identifies and meets new needs, gathers more information and aims toward more responsible deployment of resources.

For instance, MAG's medics have a greater role to play in the community, where they develop skills both during their rotation through local hospitals and in the new information they take back to their village where their team is based. MAG is constantly developing both this medical activity and new emergency response teams that are available for deployment to any community throughout the world. MAG also provides both training teams and experienced project managers to help local organisations grow stronger, ensuring a sustainable future for all.

MAG's development of the MAT and the community-based approach have given the programme a flexible tool that produces results—tangible solutions to genuine problems. Through the use of the MAT concept, MAG has been able to have a significant beneficial impact on the lives of thousands of Angolans. This has been achieved through the effective prioritisation of tasks and the efficient use of limited resources. This is and will remain MAG's fundamental mission: to clear mines, save lives and build futures for some of the world's poorest communities.
Improving the Socio-economic Impact of Humanitarian Mine Action

Sara Sekkenes

Introduction

The Norwegian People’s Aid (NPA) humanitarian mine clearance programme has the objective of supporting the implementation of humanitarian emergency and development initiatives. Mine clearance is carried out to improve the socio-economy in conflict and post-conflict societies, with clearly defined target groups as primary beneficiaries of the mine action activities. Mine action is one of the NPA’s six global programme areas and is not itself an end, but follows the organisation’s international engagement principles. The NPA’s international activities range from emergency relief and assistance to long-term development co-operation, with emphasis on the latter.

This paper presents and to a certain extent addresses the issue of mine action activities, their implications and their socio-economic impact on rural and urban communities. It deals with mine action activities in general, but focuses more specifically on prioritisation and task selection procedures within needs-oriented humanitarian mine clearance action. These activities are needs-oriented in that in some way they should help to improve living conditions for defined target populations and enhance the socio-economic situation within the communities in which mine clearance has been completed.

Apart from the socio-economic realm, several other specific aspects, such as environmental considerations, gender sensitivity, and so on should be taken into account when selecting and carrying out mine action activities. However, in this paper these are not dealt with separately, but rather as integrated aspects of the overall socio-economic framework of society.

The NPA’s policy statements below, as outlined in the programme objectives for the year 2000 provide a point of departure to emphasise
that mine action activities are only part of NPA’s overall humanitarian emergency and development activities — thus the term humanitarian de-mining as opposed to general mine clearance.

- Facilitation: De-mining should be used as a tool for the facilitation and implementation of further emergency and development work.
- Technical efficiency and optimalisation: The ‘toolbox’ concept⁴ should be further developed so as to reach the optimal, most realistic and most cost-efficient method of humanitarian mine clearance.
- Capacity building: Competent transfer and nationalisation of the NPA’s mine action programme to provide a sustainable long-term solution to the landmine problem.

Mine clearance is less a survival strategy than a means to improve the recovery of Angolan rural and urban areas. It facilitates the rehabilitation and reconstruction of lives and livelihoods, which is the ultimate objective of NPA. In order to accomplish this, NPA strives to work in close co-operation with other national and international non-governmental organisations (NGOs), UN agencies and government authorities engaged in non-mine action activities, such as humanitarian emergency and development efforts.

The immediate objectives in each location in which NPA undertakes mine action activities are to develop situational assessments related to the needs within the particular community so as to provide a context within which clearance activities should be carried out.

Deployment is based on rigid prior assessment, follow-up and monitoring of the socio-economic indicators that will ultimately justify the activity in relation to NPA’s objectives.

How does NPA implement its policy statements?

NPA mine action in Angola: Past and present

NPA initiated its mine action programme in Angola in 1994, after having been formally requested by the World Food Programme and Swedrelief to establish a manual mine clearance capacity to support the restoration of road links between Luanda and Malanje. The operation commenced in early 1995. At the same time, agreements with the United Nations Children’s Fund (UNICEF) and other national and international NGOs led to the launching of a broader mine action programme. In addition to road clearance, the NPA initiated an

⁴ An integrated mine action technology built upon a variety of mine clearance methods complimenting each other and deployed as most suitable for an area in relation to topography, ground conditions, vegetation, climate, manpower, perceived mine threat, cost-efficiency, etc.
Beyond De-mining

extensive mine awareness programme, introduced a comprehensive
landmine survey programme and provided support to the Instituto
Nacional de Remoção de Obstáculos e Engenhos Explosivos (INAROEE)
as the national institution began creating a central landmine database.

The manual de-mining programme was expanded and facilities for
the training of de-miners were set up, first in Malanje and then in
Lobito, where NPA established its mine action headquarters. Initially,
expatriate personnel trained, supervised and managed the manual de-
mining groups, but all positions in the manual groups have been handed
over progressively to Angolan staff. Support units were established
within the fields of administration and finance, transport and logistics
and paramedics. During 1997 and 1998 mechanical mine clearance was
introduced and developed, together with a dog capacity and explosive
ordnance disposal (EOD) qualified personnel, to form parts of the NPA
mine clearance ‘toolbox’ concept. Today, six years later, the mine action
programme consists of six different projects with mine clearance
capacities or mine-related ‘preventive’ activities. The programme now
employs some 700 Angolan and 20 expatriate staff.

The manual de-mining project

Four manual groups, totalling 350 manual de-miners, are deployed in
the four regions surrounding Malanje, N'Dalatando, Lubango and
Luena, in Malanje, Kwanza Norte, Huila and Moxico provinces
respectively.

The mechanical verification and mine clearance project

Two Hydrema and three Aardvark mine clearance machines are used
for verification, area reduction and mine clearance tasks. These assets
are currently based in Huila, Cunene and Malanje provinces.

The mine detecting dog project

Explosive vapour detecting dogs are utilised for verification of air
samples collected in suspected mine-contaminated areas by sampling
teams, and free running dogs are used for detecting mines and
unexploded ordnance (UXO).

The EOD/BAC project

EOD and Battle Area Clearance (BAC) teams are deployed for the
removal and disposal of UXOs.
The landmine survey project and database capacity

The collection, analysis, management and dissemination of mine and mine-related information is used for the effective co-ordination and organisation of a coherent humanitarian mine action programme.

The mine awareness project

Mine awareness campaigns are designed for the local population and communities, to spread knowledge of the danger of mines and UXO.

Mine action programme objectives

The NPA's mine action programme aims to provide an integrated tool (landmine clearance and verification mechanism) to facilitate the rehabilitation and reconstruction of social and physical infrastructure in suspected and verified mine-contaminated areas.

Not only does mine action promote a better and safer existence for people in the areas where they live and work, it also allows for increased movement of people and goods and hence allows for traditional as well as modern economic and social interaction to take place. In the medium- to long-term, a fertile ground for political engagement is created, as the obstacle of isolation is removed and cultural exchanges can take place. Moreover, communities' dependency on international aid organisations' distribution networks for food and non-food items are decreased, as they can purse subsistence and commercial cultivation independently.

However, for this to take place, it is imperative that the mine action programme's structure and organisation is geared to the future utilisation of the land cleared. Put simply, the target groups and beneficiaries of mine clearance activities need to be well defined. Priorities must be evaluated in relation to the needs of the target groups, and followed up once de-mining has taken place. In a constantly changing environment such as Angola, it is difficult to guarantee the proper utilisation of cleared land. Despite this, no effort should be spared to carry out the objectives specified in a particular area, and to ensure other entities take over the responsibility of implementing the defined activity once an area has been cleared.

Priority setting involves not only humanitarian mine clearance teams but also the local population, local and provincial authorities, national and international NGOs and UN agencies engaged in emergency aid and/or development efforts.

The process of selecting areas for mine clearance requires co-ordination of activities, and should therefore be done in conjunction with the related organisations. This will ensure the smooth running of the
planned activities in co-operation with the target groups. The target groups should be explicitly defined as economically, socially and politically vulnerable and marginalised groups, hindered from proceeding with normal life due to the presence of landmines and unexploded ordnance. As stated in the NPA policy guidelines for international engagement: the aim is to secure 'better living conditions and quality of life for those who are destitute or oppressed'.

The internal targets of the NPA's mine action programme must be measurable. This is important for the successful implementation of the programme, because it provides actors within the NPA with shorter term goals and establishes the framework for internal quantitative and qualitative evaluation procedures. Measurable goals also provide the basis for the structure and organisation of the programme in terms of operational procedures, training programmes for human resources, time/cost efficiency measures, etc.

The two objectives achievable in the short- to medium-term are:

* to hand over areas (mine free or safe) to local communities after verification and marking, area reduction and/or clearance; and
* to reduce the number of landmine casualties.

The third objective and an important long-term aspect of mine action is:

* to nationalise the programme so that, in time, operational and managerial aspects of the projects are run by Angolans and expatriate staff can be phased out.

**Needs-oriented mine action**

Defining mine action objectives is not enough. Guidelines are needed to direct how the objectives should be achieved. For instance, the mine action objectives have to embody both the organisation's values and policies and the organisation's operational capacity (human resources, equipment, finances, standard operating procedures, and so on).

The NPA conducts de-mining in support of the needs of Angolan society. Together with local populations and administrations and other humanitarian bodies, the NPA determines what these needs are, and assesses how the de-mining capacity can address these needs.

The de-mining capacity will rarely be able to address these needs independently, but rather functions as a facilitator and catalyst for other humanitarian emergency and development initiatives. Therefore the NPA has to communicate and co-ordinate with the government and other NGOs, while attempting to understand the complex local, regional and national development contexts.

Depending on the situation, communities' needs will place different
demands on the NPA. Angolan communities are not affected by landmines and UXOs in a uniform manner. Some communities have pressing mine action needs, while others have none. Mine action programmes need to prioritise which communities are in the greatest need of assistance and act accordingly. Prioritisation does not only involve the identification of the most vulnerable communities. It also involves assessing which prioritised communities the organisation can assist in terms of what resources are available. Therefore, a balance is required between the most vulnerable target groups and the organisation’s abilities.

The Angolan operating environment is dynamic. The ongoing hostilities continually alter the needs of most vulnerable groups, and consequently the priorities set by organisations such as the NPA. Such a dynamic environment requires flexibility at all levels of the organisation. Reorientation and resetting of priorities will naturally lead to disruptions in operations. Nonetheless, these disruptions should be the result of changing factors beyond management’s control, and not the result of poor planning. Planning should not be extensively rigid and complex and result in certain capacities standing idle while waiting for another capacity to complete its task. Contingencies must be assessed, and the activities led, co-ordinated and followed up on a continuous basis.

**Mine action assessments for socio-economic analysis**

The collection, analysis, management and dissemination of information concerning mine sites and UXO locations are crucial for effective mine action co-ordination and the strategic use of resources. In a process parallel to the ongoing mine clearance activities, all NPA de-mining capacities carry out ‘recces’ on survey material and formal clearance requests from local and provincial authorities and humanitarian emergency and development organisations. The starting point for establishing priorities involves an assessment of where the landmines and UXOs are. Analysis of the Level 1 survey information enables operators to categorise mine areas according to perceived mine threat (in other words, location and contamination).

The NPA Level 1 survey is the information gathering process designed to record general details of mine sites and UXO. The survey reports document the geometry and position of the mined or suspected mined area, type and estimated quantities of mines and UXO and additional socio-economic information to facilitate the priority setting of de-mining tasks. This information is merged with socio-economic indicators to establish the impact of landmines on local populations.

The survey information will determine the appropriate clearance or
marking methods (mechanical mine clearance, manual mine clearance, dogs, mine awareness, marking or even a combination of the various methods) for the surveyed area. In short, the appropriate methodology is chosen. NPA mine action projects meet on a tri-monthly basis for coordination and planning meetings. The status of ongoing tasks and planning for new tasks is determined in relation to the available resources (e.g. human resources, transport and logistics, equipment available, finances, training needs, etc.). If a task corresponds to the defined priorities and resources available, then the decision to proceed is made.

The priority setting process must comply with the NPA’s Angolan Mine Action programme terms of reference, the framework of broader NPA principles and with the limitations of the organisation’s capacity within various projects.

**Priority definition**

No concise official policy document exists in Angola regarding a priority framework for humanitarian de-mining. The Minister of Social Reintegration has defined the following five areas as particular priorities that humanitarian mine clearance should promote and address:

• the resettlement of internally displaced persons (IDPs);
• the expansion of agriculture;
• the rehabilitation of lines of communication;
• the rehabilitation of other humanitarian efforts; and
• the expansion of economic interests.

Although the areas within which humanitarian mine clearance NGOs should operate are defined, no allowance is made for the necessary coordination between de-mining and development NGOs. For instance, if IDP resettlement is the overall priority for land clearance, the second and third priorities need to be considered in relation to that. Similarly, the rehabilitation of communication lines is a vitally important aspect of IDP resettlement. From a sustainable development point of view, the expansion of economic interests allows for income-generating activities beyond the sphere of subsistence cultivation.

Planning for the resettlement of IDPs has to be carried out simultaneously and in conjunction with de-mining operations and other rehabilitation and development efforts. This co-ordination increases the sustainability of the resettlement programme, as specific conditions (such as social services, infrastructure and market) and possibilities (like income-generating activities, agricultural conditions) in a particular resettlement area will encourage new migration. Therefore, it is imperative that the overall development conditions are taken into account in the integrated development plan (including mine clearance).

Humanitarian de-mining should be seen as a means to an end, playing a vital role in transforming conflict and post-conflict areas into
environments that allow for reconstruction, rehabilitation and development to take place (the end). The means includes other actors who can contribute towards the rehabilitation and reconstruction of post-conflict societies.

Co-ordination and task prioritisation by Angolan authorities, international NGOs (de-mining and development) and UN agencies should take into account:

• *The path to resettlement and normalisation*: How great is the desire to return to a specific area? Where are people most likely to go? What are the push and pull factors? In what direction is society moving? What is the short-term security situation versus the longer term security situation? (These questions relate to patterns of demography, movement, urbanisation, migration, and so on.) Another question a de-mining agency should ask is: Are there any humanitarian organisations already at work in the location suggested for resettlement?

• *Commercial versus subsistence cultivation*: Who owns the land? Who gains from de-mining taking place in the area? What are the overall conditions for cultivation (climate, fertilizers, irrigation possibilities and/or needs, markets, mills, storage, transport)?

• *Movement of people, goods and money*: Who gains most from de-mining a specific network? The local population, the local middle class, national and international companies in mining, oil, agriculture? Does the cleared physical infrastructure enable freer movement of people and goods, open areas for vaccination campaigns, food distribution, and so on?

• *Offering health, education, market and law and order*: What incentives are needed to maintain people's desire to return and stay in a specific location? Examples of incentives are housing, healthposts, water and sanitation, educational facilities, markets, police, local administrations. Where are the social infrastructures located, what condition are they in, are there any plans for rehabilitation and reconstruction?

• *The scope for developing a differentiated economy*: Are communities less dependent on a single or a few income-generating activities? De-mining can make it possible for investment to occur in income-generating (private or parastatal) and/or international enterprises at the macro, meso and specifically micro level. Will people's desire to stay in a location be dependent on the possibility of income-generating work other than agricultural activities? Do any micro enterprises exist (like mills, agriculture co-operatives, marketing, workshops, electronic repair, hairdressing, furniture/carpenter work, metalwork, building construction/bricklaying, electricity, water and sanitation, food-processing, bakeries and tailoring) and if not, are there any plans to establish them?

Angola's vastly different provinces make it impossible to create an
Beyond De-mining

all-encompassing framework for priority setting. Moreover, it is unlikely that any particular framework can cover the varied conditions, potentials and needs within an individual province. Thus de-mining prioritisation is relative to the unique potentials in every location. These are: local needs in combination with cost effectiveness; efficiency; security; climate; UN and government strategies and plans; land ownership; the presence of other development NGOs; existing physical and social infrastructure; and the scope for future economic development in the area. In conjunction with these factors, emergency relief and development efforts must also take current and future resettlement programmes into account. Only then can the prioritisation of tasks for the deployment of clearance and verification units be done.

Proposed analytical framework

The capacities and vulnerabilities within specific communities are determining factors of how, and if, further development can occur within an area. Traditional aid and development work generally focuses on communities' vulnerabilities and defines 'problem areas'. However, before post-de-mining activities can take place, de-mining priorities must identify communities' capacities. This is of course dependent on whether the clearance operation is set in a post-conflict emergency or developmental context. In the latter case, and specifically in a dynamic country such as Angola (with shifting migration patterns and changing local economies), the capacities, strengths and potentials in the area become even more crucial when setting priorities.

Analysis of the capacities and vulnerabilities in a specific locality involves the isolation of various aspects or levels of the community. An analytical framework provides a useful means of making distinctions between different realms of society: the physical/material aspect; the social/organisational and the motivational/attitudinal.

The NPA Angola is now developing this framework into a working tool, or standard operational procedure (SOP) to be used in the field by its mine clearance units. This will help ensure a sound task selection procedure and thereby contribute towards the improvement of the target group’s lives. Moreover, beneficiaries, partner organisations and donors are provided with a transparent and accountable mine clearance tasking process.

Implementation of the SOP includes:

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The method for determining capacities in relation to vulnerabilities was initially developed and elaborated by M.B. Anderson and P.J. Woodrow, (Rising from the Ashes, IT Publications, 1998, p. 12f) and is utilised by, among others, the ICRC and IFRC worldwide in order to increase the impact of emergency as well as development initiatives. The model builds on the definition of vulnerabilities and capacities in three different dimensions, i.e. the physical/material, the social/organisational and the motivational/attitudinal. Development is then defined as the process by which vulnerabilities are reduced and capacities increased.
• an analytical framework with clearly defined indicators to provide the information needed as a basis for decision-making and task selection;
• training NPA staff on the definition and identification of capacity and vulnerability indicators; and
• analysis of data gathered and the overall utilisation of such a tool in the field.

Although task selection decision-making occurs at project management level and above, the tool and its concept are also meant to be utilised within mine clearance units at section and platoon commander level.

**Physical/material**

This is usually the first and only aspect that is considered. What does the problem look like physically, and what are the material resources that have to be used to solve the problem? The physical/material category includes land, climate and environment, the target population's health, their skills and labour, infrastructure, food, housing, capital or funds and physical technologies. For example, when a disaster like an earthquake occurs, or landmines and UXOs constitute an obstacle to the everyday life of communities, it is the physical destruction and the human suffering that attract most attention. Yet, although the community's activities are restricted, they still have something. In the case of an earthquake, communities might lack food, medicine and housing, but they still have some physical/material resources remaining. These could take the form of recoverable goods or even skills (for example, a farmer who knows how to plant and harvest). These recoverable goods are the physical/material capacities or strengths forming the foundation for rehabilitation and reconstruction once the obstacle is removed.

To understand the physical/material vulnerabilities, the question can be asked: What are the ways in which the population is physically vulnerable? Put simply, are individuals/communities victims because their economic activities (like farming) are hindered by the presence of landmines or UXOs, or because of prior factors such as lack of water or poor soil. Alternatively, are the individuals/communities simply too poor and too ill-equipped to sustain development in the long-term?

De-mining might help the long-term improvement of the livelihoods of the population, but it might not. The NPA’s pre-occupation is to find out what their capacities and vulnerabilities were and are and can be and thereafter to decide whether de-mining can make a difference.
Social/organisational

To understand the social/organisational capacities and vulnerabilities or weaknesses of specific target groups, the researcher must ask the question: What were the social structures within the community before the landmine and UXO contamination, and do they exist today? Also: Did this social structure help, or is it helping to overcome or bypass the problem?

The social category can include the formal political structure (local, provincial or national authorities and administrations) but also includes the informal systems through which people interact, make decisions, establish leadership (Sobas)\(^6\) or organise various social and economic activities (such as the market place, the church, and others).

The presence of social or organisational vulnerabilities or weaknesses are obvious in societies divided by conflict or prejudice. These can occur locally (for example, within families or groups of families), nationally (the government versus UNITA) or can be based on divisions of race, religion, ethnicity, language, class, and so on. The divisions weaken the social fabric to the degree that the population, or parts of the population, become more vulnerable to crisis. An obvious example would be IDPs, who suffer social (as well as physical) disruption due to their status as displaced persons.

The social or organisational capacity is what communities have left in spite of the obstacles. In ascending order of scale, this is represented by the family; the group; the community and other wider concepts of organisation (for example, the municipality or provincial government level; systems for distributing goods and services; inter and intra-family decision-making structures, and so forth). Any effort to solve the problem should build on these existing structures.

The involvement of the local population is essential, as they feel more engaged and secure in using their own organisational capacities and this could strengthen the cohesion of the community. This will also provide the NPA and other development agencies with a stronger commitment from parties to implement post-de-mining activities once the mine action programme is completed.

Motivational/attitudinal

The motivational/attitudinal realm involves how a community views itself, its members and its ability to deal effectively with its physical and social/political environment.

Initially communities are asked what people's beliefs and motivations were before the area was contaminated with landmines, and how these obstacles had affected these beliefs. Do the population believe that they can change their lives and livelihoods? Strengths or weaknesses in

\(^6\) Traditional village chiefs
motivation and attitude can make all the difference to a society's ability to rebuild what was once there (or what the community would like to see rebuilt), or to improve on the past.

The community can be psychologically vulnerable if people feel victimised or dependent. Religion, ideology and superstition can be underlying factors in the community's vulnerability or strength. Motivation and attitude are dependent on the beliefs in an area, and will therefore vary from location to location. They can also vary within a society due to social and organisational structures.

However, when identifying communities' strengths and/or weaknesses, the organisation should focus on the capacity the strength provides because people's sense of competence is the basis for any attempt to overcome a crisis and to build better and stronger economic and social systems. Failure to support and encourage communities will only make them more dependent and victimised, and resistant to assistance.

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<th>Figure 1: Capacities and vulnerabilities analysis matrix</th>
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<td><strong>Vulnerabilities</strong></td>
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<td>What productive resources, skills and hazards exist?</td>
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<td>What are the relations and organisations among people?</td>
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<td><strong>Motivational/attitudinal</strong></td>
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<tr>
<td>How does the community view its ability to create change?</td>
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**Conclusion**

As discussed in all three aspects, the physical/material, the social/organisational and the motivational/attitudinal, we should focus more on the capacities within the communities than on the weaknesses. These capacity assessments are imperative if mine clearance is to have a positive developmental impact, which can happen only if the community has the capacity to continue to develop after mine clearance
has been completed.

Therefore, to improve the socio-economic impact of humanitarian mine action, communities' needs and capacities have to be understood not specifically within mine action terms but broader developmental ones.
The Concept of the Land Use Planning Unit: A Cambodian Perspective

Oum Sang Onn

Background

Many factors have drastically affected Cambodia's security environment over the last 30 years. Besides the brutal civil war waged by the Khmer Rouge between 1975 and 1979, Cambodia has been directly influenced by foreign powers, and indirectly affected by the rivalry of the two Cold War superpowers. All of these factors have resulted in armed hostilities. In the course of these conflicts, each warring faction used landmines indiscriminately without regard for the consequences. It has been estimated that between four and six million landmines have been laid — the frightening statistic of one landmine for every two rural Cambodians. In addition, vast quantities of unexploded ordnance (UXO) are scattered throughout Cambodia. Most are remnants of the massive secret air bombing campaign conducted by the United States in the early 1970s, and are part of the two million tons of ammunition expended between 1970 and 1975.

The Cambodian landmine and UXO problem is the direct result of the three decades of wars and conflicts which have devastated the country in every sense. Cambodia has to deal with one of the worst cases of landmine and UXO contamination in the world. The Cambodian Mine Action Centre (CMAC) has recorded nearly 3,000 square kilometres of suspected mined areas and thousands of UXO locations. Landmines and UXOs threaten the personal safety of Cambodians and deny them access to their sources of income. The presence or even suspected presence of landmines and UXOs impinges on almost every aspect of Cambodia's post-conflict recovery. With the cessation of fighting, Cambodians are returning to the former battlefields to re-start their lives. Unfortunately a deadly legacy from the past conflict inhibits their access to the land.

The CMAC was established in April 1992 as an autonomous national body to co-ordinate de-mining and broader mine action activities in the country. CMAC assumed this role upon completion of the United Nations Transitional Authority in Cambodia's (UNTAC) mandate in October 1993. Its mission is to achieve an environment within Cambodia

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1 OUM SANG ONN is the Planning Director, Cambodian Mine Action Centre.
wherein people can live free from the threat of landmines and UXOs. Moreover, CMAC has been given the task of facilitating a safer environment for the much-needed reconstruction and development efforts in Cambodia. The organisation is guided by four broad programme objectives: mine marking; mine awareness; mine clearance and training. These objectives are prioritised according to the four guiding principles: land for settlement; agricultural land; land for development and infrastructure rehabilitation.

Discussion

Cambodia is one of the poorest countries in the world. Almost 85% of its 11 million people live in rural areas, and the incidence of poverty is the greatest among farmers whose livelihood is primarily derived from agriculture. Cambodian farmers account for 70% of the country’s poor.

The end of the conflict led to refugees and internally displaced persons (IDPs) seeking permanent resettlement en masse. Demobilised soldiers also sought resettlement. These groups are among the poorest and are particularly vulnerable to food shortages and insecurity. Most wanted to settle in western Cambodia, widely regarded as the rice belt of the country. Agricultural land in this part of Cambodia is, however, at a premium. The large scale of refugee and IDP resettlement needs highlighted the serious shortage of land and other vital resources. Returnees are forced to risk their lives by moving into uninhabited fertile land without any knowledge of whether it contains landmines or UXOs. Mine incidents among these vulnerable groups often leave the family’s primary provider disabled, which deepens their impoverishment.

The community's responsibility is, therefore, to assist the most vulnerable groups to re-integrate into society, improve their livelihoods and security, and rehabilitate their community infrastructure and transport network. In this context, it is the development of the rural areas which will eventually lead to poverty alleviation.

Current landmine and UXO clearance efforts throughout most of Cambodia support development projects. These efforts re-establish infrastructure; provide assistance to environmental preservation activities; allow freer access to resources for all Cambodians; free land for productive use and facilitate the integration of the most vulnerable (e.g. refugees, IDPs, the poor and landless) into the mainstream community.

The United Nations World Food Programme (WFP) has reported that landmines, the displacement of farmers, continuing insecurity and shortage of manpower have caused a significant decline in the rice paddy area from 2.5 million hectares in 1967 to 1.9 million hectares
today. This decrease further contributes to land scarcity, and reduces the average size of agricultural plots, making it harder for families to feed themselves. In this regard, CMAC through its mine clearance operations during the emergency phase of intervention focused primarily on clearing land for settlement and agriculture, thus alleviating two of the greatest causes of poverty — lack of a home and lack of land for production.

Initially, de-mining activities focused on freeing contaminated land for resettlement. CMAC later realised that its de-mining activities had become isolated from community development programmes which had begun to increase at the end of the emergency mine clearance phase of the international assistance programme. CMAC often noticed that the plots it had cleared to support returnees, the poor and landless were later found to be abandoned or occupied by individuals other than those they had been intended for. In many such cases, the settlers had moved away or sold their land at a low price because there was insufficient and only intermittent community support for them. These people either settled elsewhere or became perpetual IDPs.

A 1993 non-governmental organisation (NGO) forum in Phnom Penh concluded that landmine contamination was the single largest factor hindering Cambodia’s socio-economic reconstruction and development. Landmines and UXOs inhibit Cambodia’s development in three ways:

**Landmine casualty**

Cambodia has one of the highest landmine incident rates in the world. Since 1997 more than 4,400 landmine incidents were recorded by the Cambodian Mine Incident Database project.\(^2\) The number of recorded landmine incidents dropped from an average per month of 254 in 1996 to 84 in 2000. This is still an unacceptably high figure. The end-goal of all mine action is to achieve a situation of zero victims. The most recent mine incident database report (2000) revealed that 91% of landmine casualties are civilians, 32% of which are children. More than half (54%) of the cases occurred while Cambodians carried out their daily tasks (such as collecting firewood, farming and travelling). Spontaneous villager de-mining also played a large part in civilian landmine incidents: alarmingly, 41% of landmine and UXO incidents were the result of tampering with explosive devices.

Bearing these distressing statistics in mind, communities and mine action agencies must constantly review their mine awareness efforts and strategies. Their mine action interventions need to be more efficiently

and effectively planned and directed.

Cambodia has one of the highest ratios of amputees in the world. Moreover, according to the Cambodian Landmine Monitor, at least 13,709 Cambodians died between 1979 and 1999, and 40,312 were injured as a direct result of landmine and UXO incidents. These statistics highlight the need for increased allocation of resources to landmine survivor assistance programmes. A Jesuit Service Disable Outreach study of 1,663 landmine survivors in one province revealed that:

- 71% did not have housing that sheltered them from the rain;
- 7% had no house at all;
- 45% had to travel more than five minutes to get drinking and washing water;
- 89% reported food insecurity;
- 32% had no land for housing or gardening;
- 28% received some sort of pension from the government, varying between $8 and $40;
- only 50% were employed (including farmers); and
- 46% of the children did not go to school.

Therefore, humanitarian assistance to landmine victims cannot be limited to emergency food and shelter and subsistence support. Additional assistance in the form of healthcare, prosthetics, wheelchairs, rehabilitation, vocational training, socio-economic integration programmes and employment and education opportunities can help to restore landmine survivors' dignity. Only this type of mine action intervention will have a real and lasting impact on mine-affected communities.

Accessibility

No official comprehensive study of the economic costs of landmines in Cambodia has been conducted, and opinions vary as to their extent. A 1995 British Medical Journal study estimated that agricultural production would increase by 135% when the mines were cleared. Various organisations (like the WFP poverty database and the Cambodia Red Cross mine incident reports) have conducted limited assessments, but the results cannot be generalised as applying to the entire country. A better understanding of the socio-economic impact of landmines in Cambodia is expected within the next 18 months, with the completion of the CMAC national Level 1 survey. The survey's expected output is extensive mapping of areas contaminated by mines and UXOs as well as relevant socio-economic information on these areas. This
survey may be constrained by the surveyors' inability to access many mined areas, in large part due to the strategic pattern of mine laying in Cambodia. Landmines were laid on roads, in villages, on river banks, bridges and bridge bypasses, in farmland surrounding villages and around military positions. Most of these areas are prime properties on which people want to resettle, but to which they are denied access due to the presence of mines and UXOs.

Although some believe farmland to be less contaminated than other land, the vital infrastructure (that is, access paths, water sources, healthcare, schools, and so on) surrounding agricultural land is heavily mined. Without access to farmland, villagers are forced to forage for food in mined areas — resulting in even more accidents. The challenge for humanitarian aid and development agencies is to provide these communities with subsistence support and road access, such as roads linking communities to allow the increased flow of goods and services.

**Land tenure**

After nearly three decades of civil conflict, Cambodia has another very important issue to deal with (second to landmines). That is land ownership. Records of land ownership prior to the Khmer Rouge dictatorship were completely destroyed — robbing all Cambodians of their land. In fact, overnight the entire population became displaced and landless. Currently the court system is preoccupied with land dispute cases. Cambodia's land insecurity can be illustrated as follows:

- one in every 25 households in Cambodia has been affected by such disputes;
- one in every 30 farming households is in dispute with the military or another authority over farmland;
- one in every six farmers has no land;
- the poorest half of Cambodia's population owns less than 25% of cultivated land; and
- it was estimated that less than 20% of land has been registered.

The Royal Cambodian government has been trying to overhaul the legislative framework managing the national land stock for the last four years. In the absence of a proper and effective legal tool, land tenure still remains a major hindrance to development.

How is land insecurity related to de-mining? A study conducted by CMAC's socio-economic branch revealed that there are many types of land dispute related to de-mining and development. The following are types of dispute cited by the (provincial) Land Dispute Settlement Commission:
• Disputes stem from the previous years of conflict and the presence in most provinces of the military, who were dominant politically and economically. Land under the military's control during the war was sold off periodically when cash was needed. The value of land has increased significantly in post-conflict Cambodia, and as a result many purchasers have rented out their land. This creates confusion about whether the landlords or the occupants are the legitimate owners.

• Disputes occur on the return of refugees and IDPs to their previous homes. Many return to find their villages and homes occupied by others, and are then resettled in vacant areas, not knowing whether the land is publicly or privately owned.

• Disputes arise over land-grabbing by powerful individuals and/or organisations.

• Problems occur due to cases of double titling of the same plot of land.

• Disputes are caused by unclear policy and the ownership by different government ministries of state-owned land.

• Problems arise due to weak governance and low capacity amongst some government officials.

Land disputes have not yet extended to protected areas, but are endemic to almost every province in the Kingdom. The land problem is largely deemed to be the result of a lack of land use planning. Accordingly, the government established a new ministry, the Ministry of Land Management, Urban Planning and Construction in July 1999. Since its inception, the ministry has not carried out its mandate effectively, mainly due to political and budgetary constraints. Therefore, the responsibility for appropriate land usage and planning lies with the provincial and local authorities.

This worrying situation prompted CMAC to review its planning and deployment strategy. An internal review led CMAC to regard de-mining not as a stand-alone activity but as an integral tool for supporting the community. With today's competition for resources, mine action must be more efficient in addressing communities' needs. Therefore, CMAC cleared land must be put to the best possible use. All mine clearance activities must be well co-ordinated and the planning holistic. In this regard, CMAC was the driving force in mobilising the community to participate in a new planning process. This resulted in the introduction of a provincial planning mechanism which includes:

• a Provincial Sub-Committee (PSC) for the Management of Land in Mined Areas;

• a District Working Group (DWG); and

• the Land Use Planning Unit.
Today CMAC conducts its clearance operations according to an approved work plan developed by the combined efforts of the whole community, including development NGOs and CMAC. In conjunction with other development organisations, CMAC has become a key player and partner in provincial rural development projects. Mine clearance has taken the lead in the transformation of former battlefields into productive agricultural land. De-mining has therefore become a tool for development.

This growth in mine action policy led to the creation of the Land Use Planning Unit (LUPU) in the Battambang province and the Land Use Management Unit (LUMU) in the Banteay Meanchey province. These structures have been very effective in the management of de-mined land and it is hoped that similar structures will be established throughout Cambodia.

**The land use planning concept**

CMAC was one of the most prominent organisations promoting the development of the LUPU concept. This role was adopted because CMAC is accountable to the donor community for the socio-economic benefits derived from de-mined land. The organisation has to ensure that cleared land reaches the intended beneficiaries. Therefore, a mechanism has been established to prevent land disputes over de-mined areas, and to ensure mine clearance occurs where the socio-economic benefit is greatest.

CMAC does not shoulder the sole responsibility for selecting and prioritising areas to be cleared. All provincial representatives of the various ministries, together with the military, police, NGOs and international organisations co-operate in tasking areas for mine clearance. Today, CMAC avoids operating in areas where land ownership may be disputed, and carries out clearance work only in the areas prioritised by the LUPU. The components of the LUPU are:

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5 The LUMU initiative focuses on broader land issues. This paper will focus specifically on the LUPU as it is primarily concerned with de-mined land.
Village and commune level

At the village and commune level, community leaders identify and highlight their own community development needs to the district authority. These needs could include resettlement; expansion of productive land or of public infrastructure such as schools, healthcare facilities and other services, pagodas and roads which are rendered inaccessible by the presence of landmines and/or UXOs. Communities' needs are then addressed by the DWG, which includes various district-level government department representatives to review, prioritise, endorse and submit the proposal to the provincial authority — the PSC for Land Use in Mined Areas.

Provincial level

The PSC, a body of provincial policy-makers comprising representatives of various relevant provincial departments (such as the department of Rural Development, Planning, Land Titling and Environment), demining agencies, development NGOs, the military and the police, reviews and makes decisions on which community needs to incorporate in the provincial plan. This committee liaises with the Provincial Rural Development Committee for the purpose of co-ordinating the development activities in the province.
Land use planning unit

Between the PSC and DWG much detailed work is required. Tasks vary from highly technical matters to time-consuming administrative functions, all of which are performed by a small functional unit, the LUPU. The LUPU's role is to provide technical facilitation and coordinate activities between the PSC and the DWG. In practice, the LUPU co-ordinates the community meetings in the following ways:

- compiling lists of areas to be de-mined (and developed);
- completing de-mining requests;
- producing area maps to be signed off by the responsible authorities;
- preparing the resettlement map;
- drawing up lists of beneficiaries properly signed or thumb printed;
- identifying the development agencies and type of assistance to be integrated into the development plan; and
- establishing criteria for the selection of land beneficiaries and land management conditions.

The LUPU concept has been more successful in ensuring that de-mined land will be used by those for whom it is intended, through a process of identifying the relevant stakeholders before mine clearance takes place. Importantly, development agencies are identified prior to mine clearance and this ensures that follow-up humanitarian intervention will take place. LUPU has also successfully minimised land disputes and gained respect and recognition from both national government and aid agencies.

Although the LUPU is considered a successful initiative, it has nonetheless encountered many constraints. These obstacles have been attributed predominantly to a lack of human resources capacity, and budgetary and political support from the central government. The funding and support of international organisations such as UNOPS, CARE, NPA and Handicap International has proved crucial. A recent review conducted by a donor-funded assessment team on CMAC's reform process suggested that the successful planning methodology currently employed by CMAC relied largely on the success of LUPU. The assessment team recommended that donors should provide future funding for this initiative.

Closing

In the context of post-conflict development, neither development nor de-mining can be sustained if they are not supported by the community.

Land cleared in good faith by de-miners became vacant or fell into the
wrong hands because of various political and societal pressures. This raises the question: Has CMAC learned from its mistakes when clearing land for the resettlement of IDPs and refugees?

The answer is yes, CMAC has learned from its mistakes. The involvement of local and provincial authorities, the communities and the aid agencies in the planning and execution phases is paramount for real success. In short, CMAC's experience shows that an inclusive and integrated approach to the identification and prioritisation of land to be cleared yields the best results for those most vulnerable.

Mine action is not just a tool, but it is also a partner in development. This is reflected in CMAC's new mission statement — Mine Action: Saving lives and helping develop Cambodia.

CMAC and the mine action community as a whole encourages partnership, co-operation, collaboration and open communication in the spirit of helping the development of Cambodia.
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<th>Position on Mine Treaty</th>
<th>Dates (month/day/year)</th>
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<td>Signed and Ratified</td>
<td>Sign date: 12/4/97 Ratified on: 12/22/98</td>
</tr>
<tr>
<td>Tanzania, United Republic of</td>
<td>Signed</td>
<td>Sign date: 12/3/97</td>
</tr>
<tr>
<td>Togo</td>
<td>Signed and Ratified</td>
<td>Sign date: 12/4/97 Ratified on: 03/09/2000</td>
</tr>
<tr>
<td>Uganda</td>
<td>Signed and Ratified</td>
<td>Sign date: 12/3/97 Ratified on: 2/25/99</td>
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</table>
## Landmine Ban Treaty: African countries (continued)

<table>
<thead>
<tr>
<th>Country</th>
<th>Position on Mine Treaty</th>
<th>Dates (month/day/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>Signed</td>
<td>Sign date: 12/12/97</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Signed and Ratified</td>
<td>Sign date: 12/3/97; Ratified on: 6/18/98</td>
</tr>
</tbody>
</table>

Source: International Campaign to Ban Landmines
### Select Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADP</td>
<td>Accelerated De-mining Programme</td>
</tr>
<tr>
<td>AMAC</td>
<td>Assistance to Mine-Affected Communities project</td>
</tr>
<tr>
<td>BAC</td>
<td>Battle Area Clearance</td>
</tr>
<tr>
<td>CBA</td>
<td>Cost Benefit Analysis</td>
</tr>
<tr>
<td>CMAC</td>
<td>Cambodian Mine Action Centre</td>
</tr>
<tr>
<td>CND</td>
<td>Comissão Nacional de Desminagem</td>
</tr>
<tr>
<td>COR</td>
<td>Combined Operational Response</td>
</tr>
<tr>
<td>CTA</td>
<td>Chief Technical Advisor</td>
</tr>
<tr>
<td>DHA</td>
<td>Department of Humanitarian Affairs (UN)</td>
</tr>
<tr>
<td>DPKO</td>
<td>Department of Peacekeeping Operations (UN)</td>
</tr>
<tr>
<td>DWG</td>
<td>District Working Group</td>
</tr>
<tr>
<td>EOD</td>
<td>Explosive Ordnance Disposal</td>
</tr>
<tr>
<td>ERD</td>
<td>Emergency Response Division</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FAA</td>
<td>Forças Armadas Angolanas (Angolan Armed Forces)</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GICHD</td>
<td>Geneva International Centre for Humanitarian De-mining</td>
</tr>
<tr>
<td>HALO</td>
<td>Hazardous Area Life Support Organisation</td>
</tr>
<tr>
<td>HI</td>
<td>Handicap International</td>
</tr>
<tr>
<td>HMA</td>
<td>Humanitarian Mine Action</td>
</tr>
<tr>
<td>ICBL</td>
<td>International Campaign to Ban Landmines</td>
</tr>
<tr>
<td>ICRC</td>
<td>International Committee of the Red Cross</td>
</tr>
<tr>
<td>IDP</td>
<td>Internally Displaced Person</td>
</tr>
<tr>
<td>IFRC</td>
<td>International Federation of the Red Cross</td>
</tr>
<tr>
<td>INAROEE</td>
<td>Instituto Nacional de Remoção de Obstáculos e Engenhos Explosivos</td>
</tr>
<tr>
<td>IND</td>
<td>Instituto Nacional de Desminagem</td>
</tr>
<tr>
<td>IMSMA</td>
<td>Information Management System for Mine Action</td>
</tr>
<tr>
<td>LUPU</td>
<td>Land Use Planning Unit</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>MAC</td>
<td>Mine Action Centre</td>
</tr>
<tr>
<td>MAG</td>
<td>Mines Advisory Group</td>
</tr>
<tr>
<td>MAPA</td>
<td>Mine Action Programme for Afghanistan</td>
</tr>
<tr>
<td>MAT</td>
<td>Mine Action Team</td>
</tr>
<tr>
<td>MCPA</td>
<td>Mine Clearance Planning Agency (Afghanistan)</td>
</tr>
<tr>
<td>MCT</td>
<td>Manual Clearance Team</td>
</tr>
<tr>
<td>MDD</td>
<td>Mine Detecting Dog</td>
</tr>
<tr>
<td>MEDDS</td>
<td>Mechem Explosive and Drug Detection System</td>
</tr>
<tr>
<td>MGM</td>
<td>Meschen Gegen Minen (People Against Mines)</td>
</tr>
<tr>
<td>MIS</td>
<td>Mines Information System</td>
</tr>
<tr>
<td>MPLA</td>
<td>Movement Popular de Libertação de Angola</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental Organisation</td>
</tr>
<tr>
<td>NPA</td>
<td>Norwegian People’s Aid</td>
</tr>
<tr>
<td>NPV</td>
<td>Net Present Value</td>
</tr>
<tr>
<td>PDFB</td>
<td>Provincial De-mining Fire Brigade</td>
</tr>
<tr>
<td>PSC</td>
<td>Provincial Sub-Committee</td>
</tr>
<tr>
<td>QA</td>
<td>Quality Assurance</td>
</tr>
<tr>
<td>QM</td>
<td>Quality Management</td>
</tr>
<tr>
<td>R&amp;R</td>
<td>Rest and Refit</td>
</tr>
<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>TA</td>
<td>Technical Advisor</td>
</tr>
<tr>
<td>TOR</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>UNHCR</td>
<td>United Nations High Commission for Refugees</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>UNITA</td>
<td>União Nacional para a Independência Total de Angola</td>
</tr>
<tr>
<td>UNMAS</td>
<td>UN Mine Action Service</td>
</tr>
<tr>
<td>UNMCP</td>
<td>UN Mine Clearance Programme (Afghanistan)</td>
</tr>
<tr>
<td>UNOCHA</td>
<td>UN Office for the Co-ordination of Humanitarian Assistance to Afghanistan</td>
</tr>
<tr>
<td>UNOPS</td>
<td>United Nations Office for Project Services</td>
</tr>
<tr>
<td>UNTAC</td>
<td>United Nations Transitional Authority (Cambodia)</td>
</tr>
<tr>
<td>UXO</td>
<td>Unexploded Ordnance</td>
</tr>
<tr>
<td>WFP</td>
<td>World Food Programme</td>
</tr>
</tbody>
</table>
Landmines and unexploded ordnance are a global problem, with more than 80 countries affected.

This volume focuses on three major areas: first, national mine action capacities as long-term and sustainable solutions to countries’ landmine problems; second, the financial realities of mine clearance; and third, the socio-economic impact of mine clearance.

Mine clearance’s future success is inextricably linked to the need for improved co-ordination and planning to ensure the cost-effective use of increasingly limited funding. This includes better management of the de-mining toolbox and maximisation of the impact of mine clearance on communities.

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